

**Setting of Sustainability and Other Management Controls
for Stocks to be Introduced into the QMS on
1 October 2004**

Final Advice Paper

29 June 2004

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INTRODUCTION

Purpose

- 1 This paper provides advice on 17 species – bigeye tuna, blue shark, kahawai, lookdown dory, mako shark, moonfish, Pacific bluefin tuna, parore, Whangarei harbour pipi, porae, porbeagle shark, Ray's bream, red snapper, southern bluefin tuna, spiny dogfish, swordfish and yellowfin tuna– to be introduced into the Quota Management System (QMS) on 1 October 2004. The advice pertains to the setting of Total Allowable Catches (TACs), Total Allowable Commercial Catches (TACCs), and allowances for recreational interests, customary interests and other sources of mortality, and deemed values and overfishing thresholds.

New Species into the QMS

- 2 The Ministry of Fisheries (MFish) is introducing these 17 species into the QMS on 1 October 2004 as part of its programme to introduce around 50 species by 1 October 2004.
- 3 The respective Quota Management Areas (QMAs), fishing years and units of measure for the 17 species to be introduced into the QMS on 1 October 2004 were *Gazetted* in October 2003 and outlined in Table 1.

Table 1: Quota Management Areas, Fishing Years and Units of Measure for Fishstocks to be introduced into the QMS on 1 October 2003

Species (code)	Quota Management Areas	Fishing year	Unit of measure
Bigeye tuna	FMA's 1-10	1 October to 30 September	greenweight
Blue shark	1 based on FMA 1	1 October to 30 September	greenweight
Kahawai	6 based on FMA's 1-4, 8, 10	1 October to 30 September	Greenweight
Lookdown dory	FMA's 1-10	1 October to 30 September	Greenweight
Mako shark	1 based on FMA 1	1 October to 30 September	Greenweight
Moonfish	1 based on FMA 1	1 October to 30 September	Greenweight
Pacific bluefin tuna	FMA's 1-10	1 October to 30 September	Greenweight
Parore	4 based on FMA's 1, 2, 9-10	1 October to 30 September	Greenweight
Whangarei harbour pipi	1 based on FMA 1A	1 October to 30 September	Greenweight
Porae	4 based on FMA's 1-3, 10	1 October to 30 September	Greenweight
Porbeagle shark	1 based on FMA 1	1 October to 30 September	Greenweight
Ray's bream	1 based on FMA 1	1 October to 30 September	Greenweight
Red snapper	3 based on FMA's 1, 2, 10	1 October to 30 September	Greenweight
Southern bluefin tuna	1 based on FMA 1	1 October to 30 September	Greenweight
Spiny dogfish	8 based on FMA's 1, 3-5, 7-10	1 October to 30 September	Greenweight
Swordfish	1 based on FMA 1	1 October to 30 September	Greenweight
Yellowfin tuna	FMA's 1-10	1 October to 30 September	Greenweight

Initial Position Paper and Consultation

- 4 On 12 January 2004 an Initial Position Paper (IPP) was released that contains MFish's initial position on the proposed management measures for the above 17 species to be introduced into the QMS on 1 October 2004. MFish provided copies of the IPP to iwi, sector groups, and individuals and organisations considered to have an interest in the six species being introduced into the QMS. MFish also provided a copy of the IPP to those who requested a copy.

Outline of Document

- 5 This paper provides you with MFish's **initial position** and **final advice and recommendations** on proposed TACs, TACCs, other allowances and management measures for the 17 species to be introduced into the QMS on 1 October 2004.
- 6 This paper is structured so that the **Initial Position** section for each species is followed immediately by the **Final Advice** section for that species.
- 7 In addition, this paper includes a section from the IPP, titled Statutory Obligations and Policy Guidelines, that relate to the setting of TACs, TACCs and other allowances for each species. This section is followed by another section from the IPP, titled Deemed Values and Overfishing Thresholds. This section is followed by discussion of generic issues raised by stakeholders in submissions, titled Generic Issues. The sections on the individual species then follow.

Implementation of Decisions

- 8 Following your final decision on the management measures outlined in this document, you will forward formal notification to the Parliamentary Counsel Office for declaration in a *Gazette* Notice. MFish anticipates the *Gazette* Notice will occur on Thursday, 15 July.
- 9 A meeting has been scheduled on Monday, 5 July to discuss the content of this document with you.
- 10 In addition, s 12(2) of the Fisheries Act 1996 (1996 Act) requires that after setting or varying any sustainability measure, you are to, as soon as practicable, write to sector groups advising them of the reasons for your final decisions. MFish proposes to compile a decision letter once decisions on TACs, TACCs and allowances, relevant regulatory amendments have been made for the 17 species being introduced into the QMS on 1 October 2004.

STATUTORY OBLIGATIONS AND POLICY GUIDELINES

Purpose of the Fisheries Act 1996

- 1 The purpose statement of the Fisheries Act 1996 describes the overriding objective of the Act as being to provide for the utilisation of fisheries resources while ensuring sustainability. The Act defines 'ensuring sustainability' as to 'maintain the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment'. Management of a specific stock must be consistent with these dual requirements in order that sustainability of the stock can be ensured.
- 2 'Utilisation' of fisheries resources is defined as conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural well-being. Within the parameters of these sustainability standards, there is a positive obligation to provide for the use of fisheries resources.
- 3 The extent of management measures required to achieve the purpose of the Act will produce a continuum of potential outcomes. Utilisation may be provided for at different levels and the extent of such use should be considered on a case by case basis. Where there is a significant threat to the sustainability of a fishstock, the measures adopted to achieve sustainability are likely to be more stringent than where there is a lesser threat.
- 4 Consideration of social, economic, and cultural wellbeing (in conjunction with other considerations consistent with the purpose and principles of the Act) may influence how measures to ensure sustainability are implemented. Hence, providing for utilisation while ensuring sustainability may be achieved in different ways, and the objective may be reached over time. Consideration of the purpose of utilisation may be relevant in determining which is the most appropriate approach.

Setting a Total Allowable Catch

- 5 Below the level of the purpose statement, the Act contains a number of specific provisions relating to ensuring a stock is managed sustainably. A key measure is the setting of a TAC for a QMS stock. The Minister is required to set a TAC for each QMS stock. The Act contains a number of different options in terms of the intended target level able to be implemented for a QMS stock. All of the options are consistent with the purpose of 'ensuring sustainability', but each option provides for a fundamentally different management outcome.

Maximum Sustainable Yield (s 13)

- 6 Section 13 represents the default management option that is to be applied when setting a TAC for a stock within the QMS, unless that stock qualifies under criteria for management under ss 14 or 14A.

- 7 Under s 13 there is a requirement to maintain the biomass of a fishstock at a target stock level, being at, or above, a level that can produce the MSY, having regard to the interdependence of stocks. MSY is defined, in relation to any fishstock, as being the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the population dynamics of the stock and any environmental factors that influence the stock. A requirement to maintain stocks at a level that is capable of producing the MSY is generally recognised internationally as being an appropriate fishstock target, although there is some international support for MSY representing a minimum fishstock threshold level.
- 8 If a stock is currently below the target stock level, there is a requirement pursuant to s 13(2)(b) to set a TAC that will result in the stock being restored to the target stock level (ie, at or above a biomass that will support MSY) and in a way and rate which has regard to the interdependence of stocks and within a period appropriate to the stock, and having regard to the stock's biological characteristics and any environmental conditions affecting the stock. If the stock is above a target stock level, there is a requirement to set a TAC that will result in the stock moving towards the target stock level, or alternatively remain above the target stock level, having regard to the interdependence of stocks (s 13(2)(c)). In determining the way in which, and rate at which, a stock is altered to achieve the target stock level, the Minister is to have regard to such social, cultural, and economic factors as he or she considers relevant (s 13(3)). Section 13(3) makes it explicit that such factors are relevant in the determination of the way and rate of progress to the target level, rather than in the determination of the target stock level itself.
- 9 There is no set rate, or time frame, within which a rebuild or a 'fishing down' of a stock must be achieved. However, the progress of moving towards the target stock level must be suitable to the fishery in question, having also considered those matters specified in s 13 of the Act. Hence, a TAC should be viewed as a tool for moving a stock towards the target stock level. Other measures may be adopted in conjunction with a change in the TAC. However any additional measures should not be relied on in place of the TAC.
- 10 Additional flexibility is encompassed within s 13 by the capacity to provide for an in-season adjustment to the TAC for certain stocks. Any TAC that is set or varied has effect on and from the first day of the next fishing year for the stock concerned. An exception applies to those stocks listed on the Second Schedule to the Act. This Schedule can apply to any stock with a highly variable abundance. For such stocks in years of high abundance, the TAC may be increased in-season and the Minister may allocate all or part of that increase as Annual Catch Entitlements (ACE) to commercial fishers. At the commencement of the next fishing year the TAC reverts to the level set at the commencement of the previous fishing year. This means that commercial catch levels, not property rights in the form of individual transferable quota (ITQ) are increased during the fishing year.
- 11 An in-season TAC increase may be distributed between commercial, customary and recreational fishers, and an allowance made for other sources of mortality to the stock. The increase allocated to commercial fishers does not result in an increase to the TACC during the fishing year.

- 12 The fundamental objective of an in-season adjustment is to manage a stock at or above the level that can produce the MSY. Information about what is the desirable level of the TAC that can produce the MSY is available at such a time that a decision is made after the start of the fishing year. However, at the end of the fishing year, the TAC reverts to the level that was applicable at the start of the fishing year.

No Specified Target Stock Level (s 14)

- 13 Section 14 of the Act prescribes an exception to the target stock level based on an assessment of the MSY for those stocks where:
- a) It is not possible to estimate MSY because of the biological characteristics of the species; or
 - b) A catch limit for New Zealand has been determined as part of an international agreement; or
 - c) The stock is managed on a rotational or enhanced basis.
- 14 For stocks that meet the above criteria, and as a result are listed on the Third Schedule of the Act, a TAC may be set other than in accordance with the requirements in respect of target stock levels stated in s 13, provided the TAC better achieves the purpose of the Act.
- 15 While any TAC must be set in a way that ensures use of the stock is sustainable, there is no requirement to take into account or be guided by the need to manage in accordance with MSY. In contrast to s 13, s 14 provides significant flexibility as to the target stock level set for a stock. The rationale for that flexibility is different for each of the categories of stocks eligible for listing on the Third Schedule.
- 16 The biological characteristics of some stocks mean that it is not possible or necessary to estimate the MSY to ensure the sustainability of the stock. For example, squid is a short-lived species. There is currently no ability to estimate the available abundance either before or within the fishing season. The extent of catch taken from the available biomass will not affect future recruitment or abundance of the species. For this reason, the TACs set for squid stocks have not been significantly changed during the last decade, but the actual catch levels have fluctuated markedly within that time.
- 17 Under an international agreement, a catch limit for a species may be set and allocated between individual fishing nations, eg, southern bluefin tuna. Typically such international agreements relate to highly migratory species or species that straddle national boundaries. The overall catch limit set for the species must be consistent with international fisheries management law; hence, the catch limit would need to ensure the sustainability of the species. There is no requirement that New Zealand separately manages that portion of the species it is allocated at MSY.
- 18 The third category relates to those stocks managed on a rotational or enhanced basis. The effect of rotational fishing or fisheries enhancement is that MSY may no longer be the appropriate target level (eg, scallops in area 7 (SCA 7)). Enhancement is designed to increase the level of abundance. While enhancement of the stock may not need to be consistently maintained, the ability to intervene to increase abundance

means that the sustainability of the stock can be ensured. The available yield will change over time.

- 19 Rotational harvesting involves selective harvesting of a portion of the stock. Rotational fishing is best suited to sedentary species or stocks with established fishing grounds. The yield taken in any one year may not be the MSY available for the stock overall. The ability to successfully manage a stock on a rotational basis may be dependent upon the biological characteristics of the stock.
- 20 A combination of rotational harvesting and enhancement may result in greater flexibility in setting a TAC that will ensure the sustainability of the stock. Enhancement may enable rotationally harvested areas to be restocked at a level above that which could be naturally produced. Enhancement may also provide an ability to maximise catch from each area as it is rotationally fished. Areas closed to fishing allow both enhanced and wild stocks to contribute to the spawning biomass and reach harvestable size before being subjected to commercial fishing. Area closures may protect sufficient adult stocks to ensure adequate recruitment to the fishery.
- 21 As with s 13, s 14 provides for an in-season increase to the TAC for stocks listed on the Third Schedule. The purpose of an in-season increase under s 14 is to take advantage of the available yield beyond any pre-determined target stock level. However, the level of the in-season increase must be consistent with the objective of ensuring sustainability of the stock.
- 22 An in-season TAC increase may be distributed between commercial, customary and recreational fishers, and an allowance made for other sources of mortality to the stock. Additional ACE is generated during the fishing year in respect of the increase in the TAC allocated to commercial fishers. At the close of the fishing year the TAC reverts to the level set at the beginning of that fishing year.

Above Level of Long Term Viability (s 14B)

- 23 A further exception to setting a TAC in accordance with the MSY is the management of a stock under s 14B of the Act. A TAC is to be set at a level that ensures the stock is maintained above the level that ensures its long-term viability. However, the Minister must be satisfied that the purpose of the Act would be better achieved by setting a TAC other than in accordance with s 13 of the Act (ie, at or above MSY). Maintaining a stock above the level that ensures its long-term viability is consistent with the purpose of the Act in relation to meeting the reasonably foreseeable needs of future generations.
- 24 The purpose of s 14B is to enable other related stocks to be fully harvested. The stock in question must be taken primarily as an incidental catch during the taking of one or more other stocks and must constitute only a small proportion of the combined catch taken. The Act does not prescribe a level that is deemed to be above that which ensures the long-term viability of a stock. That determination is required on a case-by-case basis, subject to the requirement that the TAC must be set at a level no greater than what is required to allow for the taking of another stock in accordance with its own TAC and TACC. Quota owners are required to take all reasonable steps to minimise the catch of the stock managed below B_{MSY} .

- 25 Section 14B addresses the difficulty of managing stocks within a mixed fishery to B_{MSY} without forgoing some economic return. In some mixed species fisheries the TACs of minor bycatch species limit the ability of fishers to catch their entitlement of the target species and could result in closure of the target fisheries.
- 26 Section 14A specifies a number of significant tests apply in order to mitigate the risk of managing a stock below B_{MSY} . First, the stock must be able to be maintained above a level that ensures its long-term viability. Secondly, the Minister is required to consider the need to: (1) commission appropriate research to assess the impact of reducing the stock below B_{MSY} ; (2) implement measures to improve the quality of information about the stock; (3) close areas to commercial fishing to reduce any sustainability risk to the stock; and (4) avoid any significant adverse effects on the aquatic environment of which the stock is a component. Hence, the setting of a TAC under s 14B to allow for the taking of another stock may need to be balanced by the closure of areas to fishing to ensure the stock is maintained above a level that ensures its long-term viability. Consideration of significant adverse effects of fishing could have potential implications for the aquatic ecosystem as a result of reducing the biomass of the stock.
- 27 Consideration also needs to be given to the social, cultural and economic implications of managing a stock below B_{MSY} . The setting of a TAC above the level that ensures the stock's long-term variability must have the support of quota owners who hold 95% of the shares in the stock. Arrangements need to be in place to address the concerns of those quota owners who do not support the setting of a TAC under s 14B. The total benefits of managing the stock at a level other than that permitted under s 13 must outweigh the total costs. Managing the stock in a manner other than s 13 must have no detrimental effects on non-commercial fishing interests in the stock.
- 28 A final important check and balance when setting a TAC under s 14B is that the Minister for the Environment is required to concur with a proposal to enable a TAC to be set for a stock above the level that ensures its long-term variability.
- 29 The ability to set a TAC under s 14B is triggered by the submission of a proposal from quota owners to the Minister of Fisheries to manage the stock in this way. An Order in Council (ie, a regulation) must be made specifying the application of s 14B for the named stock. No proposal relating to s 14B has been received in respect of the stocks to be introduced to the QMS on 1 October 2003.

Other Statutory Obligations Applicable When Setting a TAC

- 30 When setting a TAC, a number of generic provisions of the Act need to be taken into account – in particular, the purpose of the Act (s 8), the environmental and information principles (outlined in ss 9 and 10 respectively), factors to be taken into account when setting sustainability measures (s 11), and the application of international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5).

Information Principles

- 31 The nature of the data and assumptions used to generate fisheries assessments and the results produced contain inherent variation and uncertainty. The Act specifies, in

s 10, the information principles to use when information is uncertain. Decisions should be based on the best available information that, in the particular circumstances, is available without incurring unreasonable cost, effort, or time. Decision makers should consider any uncertainty in the information available and be cautious when information is uncertain, unreliable, or inadequate. However, the absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

Environmental Principles

- 32 The Act prescribes three environmental principles that the Minister must take into account when exercising powers in relation to utilising fisheries resources and ensuring sustainability. First, associated or dependent species (including non-fish bycatch) should be maintained above a level that ensures their long-term viability. Secondly, biological diversity of the aquatic environment should be maintained (ie, the variability of living organisms, including diversity within species, between species, and of ecosystems). Lastly, habitat of particular significance for fisheries management should be protected.
- 33 The Act defines associated and dependent species as any non-harvested species taken or otherwise affected by the taking of a harvested species. The term 'long term viability' is defined in the Act as a low risk of collapse of the stock or species, and the stock or species has the potential to recover to a higher biomass level. Long-term viability may be considered in the context of the natural dynamics of populations. At one level the concept implies the need to ensure the continuing existence of species in the sense of maintaining populations in a condition that ensures a particular level of reproductive success. At another level, long-term viability implies an ability to maintain populations at a level that ensures the maintenance of biodiversity. Long-term viability could be achieved at very low levels of population size, depending on associated risks, such as recruitment failure at low population sizes. Long-term viability also needs to be considered with respect to utilisation by different sector groups. Equally, where fishing is affecting the viability of associated and dependent species, there is an obligation to take appropriate measures, such as method restrictions, area closures, and potentially adjustments to the TAC.
- 34 'Biological diversity' includes the variability among living organisms, including diversity within species, between species, and of ecosystems. The aquatic environment is of broad scope and encompasses:
- a) The natural and biological resource comprising any aquatic ecosystem; and
 - b) All aquatic life and all places where aquatic life exists.
- 35 The maintenance of biodiversity needs to be considered in the context of the purpose of the Act that assumes that, where possible, a resource should be used to the extent that sustainability is not compromised. Determination of the extent of fishing or the impacts of fishing that can occur requires an assessment of the risk that fishing might cause a species to become extinct or biodiversity is reduced to an unacceptable level. In the absence of information to undertake a detailed assessment, the information principles specified in the Act provide guidance for decision makers on the approach to be adopted.

- 36 Habitat can be defined as ‘the place or type of area in which an organism naturally occurs’ (NZ Biodiversity Strategy). The Magnuson-Stevens Fishery Conservation and Management Act (USA) defines ‘essential fish habitat’ as ‘those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity’. The maintenance of healthy fishstocks requires the mitigation of threats to fish habitat. However, the source of the threats may not be confined solely to the activity of fishing. A range of terrestrial activities may impact on fisheries habitats. Habitats that assist in the reproductive and productive process of a fishery, hence are of special significance, should be protected. Adverse effects on such areas are to be avoided, remedied, or mitigated.
- 37 Insufficient information is available to undertake a systematic assessment of biodiversity for the stocks to be introduced to the QMS on 1 October 2003. No ecosystem, population, assemblage assessment has been undertaken in respect of the stocks reviewed. However, an assessment of the relative information available and the degree of risk in relation to the environmental principles are outlined in this document for each stock.

International Obligations (s 5(a))

- 38 There are a range of international obligations that relate to fishing. The two key pieces of international law relating to fishing, and to which New Zealand is a party, are the United Nations Convention on the Law of the Sea, 1982 (UNCLOS) and the United Nations Convention on Biological Diversity 1992 (the Biodiversity Convention). It is MFish’s view that the provisions of the Act, and the proposed exercise of powers under the legislation are consistent with New Zealand’s international obligations.
- 39 The Act is to be interpreted, and all persons exercising or performing functions, duties, or powers under the Act are required to act, in a manner consistent with New Zealand’s international obligations relating to fishing. As a general principle where there is a choice in the interpretation of the Act or the exercise of discretion, the decision maker must choose the option that is consistent with New Zealand international obligations relating to fishing (s 5(a) of the Act).
- 40 MFish is involved in a number of initiatives relating to the management of stocks within the EEZ that are consistent with its international obligations. MFish seeks to give effect to those obligations on a generic basis. Application of generic policies, such as the marine protected area strategy and MFish’s environmental management strategy, to the management of specific stocks will follow in due course.

Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5(b))

- 41 The Act is to be interpreted, and all persons exercising or performing functions, duties, or powers under the Act, are required to act in a manner consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5(b)). This requirement is intended to further the agreements expressed in the Deed of Settlement referred to in the Preamble to the Settlement Act. In particular, Māori non-commercial fishing rights continue to give rise to Treaty obligations on the Crown.

- 42 The species-specific papers in this document set out information relating to the customary interest in the species concerned. An allowance for customary fishing has been made for each stock on the basis of a qualitative assessment of that interest. The consultation process will provide Māori with an opportunity to comment on the customary use and management of the stocks. However, no explicit consideration has been given to the application of the specific customary management tools available under the Act to the stocks concerned. Introduction of the species to the QMS will not preclude adoption of appropriate management measures in the future to provide for customary use and management practices.
- 43 In accordance with the Settlement legislation, the Treaty of Waitangi Fisheries Commission will be allocated 20% of all quota shares in the TACC set for the stocks on introduction to the QMS.

Additional Factors to be taken into Account (s 11)

- 44 Before setting or varying any sustainability measure (including a TAC) the following factors must be considered:
- a) Any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991 and any management strategy or management plan under the Conservation Act 1987 that apply to the coastal marine area and which the Minister considers to be relevant;
 - b) Any effects of fishing on the stock and the aquatic environment;
 - c) Any existing controls that apply to the stock or area concerned;
 - d) The natural variability of the stock concerned;
 - e) Any conservation services or fisheries services;
 - f) Any relevant fisheries plan approved under this Part; and
 - g) Any decisions not to require conservation services or fisheries services.
- 45 Where any of the above factors are relevant, they are discussed in the species-specific sections. MFish is not aware of any specific plans, statements or strategies that are relevant to the stocks in this document. No fisheries plans have been approved to date. A fisheries plan for cockles in COC 3A has been submitted to the Minister but not approved. MFish is not aware of any other plans being contemplated at this time for any of the stocks being introduced into the QMS this year. No explicit decisions have been made not to require services in a fishery on the basis of any undertaking by stakeholders either within or outside a fisheries plan to undertake certain services directly.
- 46 Consideration also needs to be given to the most effective way of achieving the desired outcome of a sustainability measure. An important factor in supporting the use of non-statutory measures is the degree of support for the measure and the nature of the monitoring and enforcement regime proposed to support the measure. However, the process of introducing stocks to the QMS is unlikely to involve implementation of measures on a non-regulatory basis. The actual commercial participants in the fishery may be largely unknown until such time as quota is allocated.

Guidelines for Setting TACs for New Species

47 There are a number of closely interrelated factors that need to be taken into account when setting the TAC. The following factors are identified as being of particular significance:

- Identifying the appropriate TAC option for a stock (ss 13, 14, 14B): The level at which the TAC is set will be heavily influenced by the statutory TAC option proposed for the stock. Existing estimates of yield based upon on MSY or an existing catch limit for a stock might not be applicable for a stock managed under ss 14 or 14B.
- The biological and fishery characteristics of the stock and associated stocks: The biological and fishery characteristics of the stock will influence the TAC option adopted for the stock. Implications of catch levels for associated stock complexes (target and bycatch relationships) should be expressly considered. In some instances information about current catch levels may not accurately reflect actual catch ratios in multi-species fisheries due to the nature of the reporting obligations for non-QMS stocks.
- The effects of harvesting the stock on the aquatic environment: The relative effects on the environment of different TAC options should be considered. Interactions with protected species and areas of high biodiversity need to be actively managed. Consideration of predator-prey relationships is an important factor. The effects of different fishing methods should be considered.
- The capacity for development of the stock: The Act requires that consideration be given to the development of fisheries resources while ensuring the sustainability of those resources. In the purpose statement of the Act (s 8), the definition of the word 'utilisation' includes 'developing' fisheries resources. The QMS provides the most appropriate mechanism for development to occur. Development can be actively provided under the various TAC options. Rotationally harvested and enhanced fisheries provide scope for a TAC to be set at a level other than one that moves the stock towards B_{MSY} . A stock managed below B_{MSY} may provide for additional catch to be taken. In some instances stocks introduced to the QMS have been lightly fished and are deemed to be in a near virgin state; hence the stock is well above B_{MSY} . While there is no provision in the Act for TACs to be set at a nominal level, there is scope for additional catch to be taken in the short term as the stock is fished towards a level that can produce MSY.
- Important factors to be considered when considering development potential are that:
 - i) setting TACs at the level of current catch (in some instances a zero or one tonne TAC) may artificially constrain development of a stock where there is virtually no risk posed to the stock by setting a higher TAC;
 - ii) existing catch limits (competitive or ICE) may not be appropriate for the purposes of setting a TAC/TACC. This is because they were

originally designed to allow limited target fishing on a competitive basis for those fishers with existing permits. The competitive catch limits may not be reflective of actual total landings for the species concerned.

- iii) development may be constrained by a lack of a review of a stock in the immediate future once introduced to the QMS due to competing priorities for review of other stocks;
 - iv) a TAC may be set at a level that moves the stock over time towards a level that can produce the MSY (B_{MSY});
 - v) if a TAC is set at a level in order to move a stock towards B_{MSY} , information (catch and effort data or fishery independent research) needs to be forthcoming to assess when the stock is at or above the level that can produce the MSY;
 - vi) setting a TAC that provides for some level of initial development offers an incentive for fishers to invest in the fishery and develop initiatives such as adaptive management proposals and fisheries plans.
- The information principles: The Act specifies that the absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act. As noted above, the purpose of the Act contains two distinct elements 'ensuring sustainability' and 'providing for utilisation'. In the absence of an explicit hierarchy between the two objectives, a decision is to be made on a case by case basis that takes into account the available information to determine the relative weight given to each of the objectives. Any decision should explicitly identify the factors taken into account and the relative weighting placed upon the relevant information.
- Existing stock assessment information about the status of the stock: Information about current biomass and estimate of available yield may be available for only a limited number of stocks. An explicit CAY or MCY (or equivalent) management approach, complementary with the characteristics of the stock, may be adopted with the reasons stated for that approach. The certainty, reliability, and adequacy of that information needs to be taken into account. Existing estimates of yield might not be applicable for a stock managed under ss 14 or 14A.
- Current catch levels of the stock: In the absence of robust assessment information or an existing catch limit (competitive or ICE) current catch can be used as a basis for setting the TAC, subject to consideration of other relevant statutory obligations. The reliability of any information is to be taken into account.
- Monitoring of stock: Current and future monitoring of the stock is an important factor relating to an assessment of risk to sustainability. The ability to assess the stock, the nature of the assessment method and the likely robustness of that assessment, the level of observer coverage, and the nature of direct research are to be considered in the assessment of different potential TAC options.

- Relevant social, economic, and cultural factors: The ability to set a TAC at different levels will have commensurate social, economic, and cultural implications. The way and rate at which a stock is fished towards B_{MSY} should explicitly take into account relevant social, economic, and cultural factors. The interests of future generations is an important social consideration that is reflected in consideration of the TAC option adopted, the level at which the TAC is set, and the effects of fishing for the stock on the aquatic environment. Treaty obligations arising in respect of a stock are encompassed within relevant cultural factors.

Development opportunity

- 48 MFish acknowledges that information on which to base catch limits in a number of non-QMS fisheries is deficient. However, in accordance with the use of the information principles, as discussed above, MFish believes that there is opportunity in a number of fisheries on introduction to the QMS to place greater weight on utilisation opportunity in the absence of any discernable risk to the stock or the aquatic environment when considering TACs.
- 49 Catch in a number of the fisheries proposed for introduction is not reflective of abundance, but rather has been influenced by the inability to obtain access to the fishery (as a result of the permit moratorium) and marketing/processing issues. In some cases there is also likely to be significant levels of underreporting, particularly in bycatch species. Introduction into the QMS will potentially provide more access opportunities and a better framework for managing the stock, given the reporting and catch balancing requirements on fishers.
- 50 The opportunity for development and the extent of utilisation provided for needs to be assessed on a stock by stock basis having regard to risk based on the following factors:
- Information on sustainability risk to the stock;
 - Biology of the stock, including potential for localised depletion;
 - Information on historical catch, if the stock has been lightly fished therefore biomass is likely to be close to virgin or at least above B_{MSY} ;
 - Likely impacts of fishing on aquatic environment, including bycatch species etc;
 - Socio-economic and cultural issues; and
 - Anecdotal information on abundance, including consideration of the size of likely habitat in the management area.
- 51 In bycatch fisheries, in particular, interaction with other harvested stocks should be a consideration in any TAC proposed. In the absence of sustainability concerns fishers in bycatch fisheries will face punitive measures under the balancing regime if the TACs are not set appropriately.

- 52 While the initial TACs proposed are likely to provide some opportunity for development of the fishery by existing and/or new entrants, they might not provide the maximum utilisation possible for the stock. Further increases will require, in most cases, additional supporting information on the impacts of fishing on the stock and aquatic environment. These matters are best incorporated within stakeholder driven initiatives following introduction.
- 53 As a consequence of providing development opportunity above existing levels of utilisation, the TAC may not be fully caught immediately following introduction pending the development of harvesting/marketing/processing capacity. However, this in itself is not a reason not to provide opportunity for development when potential risk to the stock based on the factors noted above is considered acceptable.
- 54 MFish notes that a development opportunity within the TAC does not predetermine subsequent allocation decisions.

Use of information

- 55 The nature of the information available about each stock is likely to vary. A hierarchy (set out below) is proposed in respect of the nature of the information and hence the weighting to be assigned to that information. As a general rule greater weight will be placed on information at a higher level on the hierarchy. Stock assessment information is afforded greater weight than a non-QMS catch limit set for the stock. A catch limit or commercial catch limit may be afforded greater weight than information about historical and current catch levels.
- 56 However, careful consideration is required in assessing the nature of any current catch limit. In some instances competitive catch limits may not be reflective of actual total landings for the stocks concerned. Competitive catch limits may have also acted to constrain effort in a fishery in support of the permit moratorium (ie to limit new entrants), rather than as a measure explicitly designed to ensure sustainability of the stock. They were originally designed to allow limited target fishing on a competitive basis for those fishers with existing permits.

Table 1: Hierarchy of Information

1.	Information about status of stock and estimates of available yield	Adopted in Plenary Report	Use as basis for setting TAC (subject to consideration of guidelines identified above – ie, general statutory obligations and TAC option, etc)
		Not adopted in Plenary Report	Take information into account, but receive limited weighting
2.	Existing catch limit set (CL/CCL – competitive or ICE)	CL or CCL and catch information of fishing sectors and other sources of mortality	Use as basis for setting TAC (subject to consideration of guidelines identified above, including validity of CL/CCL)
		Sustainability concern (in context of TAC option adopted)	Review and/or reduce existing catch limit when set TAC
3.	Catch information and estimates of other sources of mortality	Apply criteria (identified below) for calculating catch information	Use as basis for setting TAC (subject to consideration of guidelines identified above)
		Sustainability concern (in context of TAC option adopted)	Review and/or reduce overall catch when set TAC

- 57 The term ‘sustainability concern’ is used to describe a situation where, after considering all relevant issues, there is a conclusion that the existing non-QMS catch limit or current catch is not sustainable and should not be used as a basis for setting a TAC. The term ‘sustainability’ is intended to encompass issues relating to the stock itself and the effects of fishing on the aquatic environment (ie, impacts of fishing method, trophic relationships, target/bycatch stock complexes).
- 58 A significant increase in catch levels of a stock in recent years may not necessarily equate to increased abundance, but rather might be an indication of increased effort and targeting of the stock. Consideration of relevant information may result in a TAC being set that is more precautionary than the current catch level.

Criteria for Determining Catch Levels

- 59 Criteria have been developed for determining catch levels and other sources of mortality. In the absence of other information TACs may be set at levels based on consideration of known or estimated levels of recreational, Māori customary, and commercial catch and all other sources of fishing related mortality. The purpose of the exercise is to calculate the overall level of catch being taken from the fishery. The information about the catch of each sector group may act as a guide to the subsequent allocation of the TAC but, in itself, that will not be determinative of that exercise. The Minister makes a separate decision about allocation after setting the TAC.

Table 2: Criteria for determining catch levels and other sources of mortality

Commercial Catch	Current catch	Current commercial catch from the fishery
	Stable fishery	Average catch for a period since 1986 where catch level has been relatively stable for in excess of three years
	Developing fishery	Average catch over last three completed fishing years where a significant increase in catch has occurred
Recreational Catch	Existing estimates (diary surveys, etc)	Use as basis for determining current recreational catch
	No estimates but known recreational catch	Nominal catch level included
	No known recreational catch	No catch level included
Customary Catch	Existing estimates (customary permits/authorisations; information provided by tangata whenua etc)	Use as basis for determining current customary catch
	No estimates but known to be of significant importance to Māori above the level of recreational take	Catch level above the known recreational catch included
	No estimates but known to be of importance to Māori	Catch level similar to known recreational catch included
	No estimates but known customary catch (and stock of no particular importance to Māori)	Catch level half of known recreational catch included
	No known customary catch	No catch level included
Other Sources of Mortality to the Stock Caused by Fishing	Quantitative information or estimates of illegal catch, discards, incidental gear mortality available	Use as basis for determining current level of other sources of mortality
	No estimates but other sources of mortality known to occur based on information about similar stocks and methods	Nominal mortality level included
	No known mortality	No mortality level included

60 In the absence of an estimate of sustainable yield from the fishery, or the presence of a robust and reliable Catch Limit (CL) or Commercial Catch Limit (CCL), an assessment of commercial catch based on the criteria of 'stable' or 'developing' has been undertaken. The criteria of 'stable' and 'developing' fisheries for estimating commercial catch were adopted in 1998 for the introduction of species into the QMS for 1 October 1998. A fishery is 'stable' when reported catches have remained relatively constant over an extended period of time (ie, in excess of three years). Included in the category of a 'stable' fishery are those stocks where the catch level has fluctuated over time. In most fisheries such fluctuation is anticipated as a natural biological occurrence. For 'stable' fisheries commercial catch has been calculated

using the average catch for a period since 1986 where the catch level has been relatively stable in excess of three years.

- 61 A fishery is ‘developing’ where a substantial increase in catch has been recorded over the last three completed fishing years. Where this has occurred the average total landings over the last three completed fishing years have been used as a basis for determining current commercial catch.
- 62 Calculation of commercial catch based on the criteria of ‘stable’ or ‘developing’ is one factor to be considered when setting a TAC. As indicated above, there may be the potential to provide some opportunity for development of a stock above existing catch levels.

Analysis of TAC Options

- 63 An analysis of different potential TAC options is undertaken in respect of each stock where there are viable alternatives. Where more than one statutory TAC option is available (ie, ss 13, 14 or 14A) an assessment of relevant information is provided. An important consideration is the respective trade-offs between different TAC options in terms of potential economic return, information levels – current and future, and sustainability concerns (stock specific and general environmental). The purpose is to indicate the relative weighting assigned to different factors for each TAC option. In most instances only a relatively subjective qualitative assessment can be undertaken.

Allocation of TAC

- 64 The Minister is required to make allowances for different fishing interests under the Act. The Minister must have regard to the TAC and allow for:
- a) Customary Māori;
 - b) Recreational fishers;
 - c) All other sources of mortality to the stock caused by fishing; and
 - d) The TACC.
- 65 In the absence of other information TACs may be set at levels based on consideration of known or estimated levels of recreational, Māori customary, and commercial catch and all other sources of fishing related mortality. The information about the catch of each sector group also acts as a guide to the subsequent allocation of the TAC but that, in itself, will not be determinative of that exercise. The Minister makes a separate decision about allocation after setting the TAC.
- 66 The allocation of the TAC is an important element of the introduction process. The amount allocated to the respective interest occurs (except for Fourth Schedule stocks) without any compensation of current interests in the fishery. For example, 20% of the commercial allocation to the Treaty of Waitangi Fisheries Commission occurs by pro-rating downwards the total provisional catches if they exceed more than 80% of the TACC. The introduction process allocates ITQ to commercial fishers as a property right. Any subsequent redistribution of the commercial allocation of the fishery to another sector may be subject to payment of compensation. (No compensation is

payable where measures are taken to ensure sustainability.) MFish considers there is benefit in considering the initial allocation of catch in light of both current and reasonable future needs or interests in the resource. Decisions at the point of introduction to the QMS may resolve some of the problems about allocation that may occur in the short to medium term at no or minimal cost to any sector where a TAC is able to set, in accordance with the provisions of the Act, at a level above the extent of current catch.

- 67 Generic factors relevant to the determination of allocation of the TAC include:
- a) Population trends;
 - b) Existing catch levels (including popularity and importance of the resource to each sector);
 - c) Current fishing practices (including overfishing, voluntary shelving, or closures by a stakeholder);
 - d) Economic impact of allocative decisions; and
 - e) Social and cultural impact of decisions.
- 68 Population trends are reflected in the level of recreational fishing undertaken, both on a national and regional context. The growth of urban centres, in particular Auckland, has a significant impact on particular fisheries. An allowance for the recreational interest and the corresponding management controls for a stock should take into account existing population distribution and growth.
- 69 Certain fisheries are considered to be of particular importance to a particular sector. The value attributed to a resource is not limited solely to economic value but may also include the non-market value. The abundance of a species and the availability of particular size fish for a specific stakeholder group may also be factors relevant to the allocation decision.
- 70 The consistent overfishing of the TACC or an allowance, which results in the reduction of the TAC, as a general principle, ought to be attributed to the stakeholder group responsible for the overfishing. Equally stakeholders may elect to exercise their fishing rights in a manner which results in their allocation in a fishery being undercaught. Voluntary closures and temporary shelving of allocation may be undertaken as a means of improving the abundance of a species and the availability of certain sized fish. Current catch by customary Māori may not reflect the extent of customary interests in a species. Decisions may be made not to fish a species due to non-availability. The allocation process should endeavour to take account of customary needs and not simply reflect the current level of catch, which may have been constrained by a lack of abundance.
- 71 The setting of a TAC and allocative decisions in a general context may impact on economic investment in terms of upgrading of plant and fleet structure. Downstream impacts may result as a consequence of allocative decisions made in respect of both recreational and commercial stakeholders. In addition to the commercial harvesting and processing sector a significant number of service industries are linked to the fishing industry, including charter operators, sale of fishing gear, repair, and transport related services. Decisions may also impact on particular communities where the

fishing and fishing related services provide a significant contribution to a local economy. Information on these matters, if available, is to be taken into account.

Recreational Allowance

- 72 In some cases estimates of recreational catches of the new species are available from recreational surveys. Where available, these estimates have been included and used as the basis for setting the recreational allowance. Where estimates are not available but there is known to be recreational catch, a nominal allowance has been made. For species and stocks where there is no or negligible recreational catch, no allowance is proposed. In all instances the allowance proposed also takes into account the factors identified above. MFish also notes that recreational fishers are not accorded a priority in the allocation of the TAC. The recreational allowance does not need to fully satisfy estimated recreational requirements.
- 73 Where appropriate, bag limits may need to be set for the stocks introduced to the QMS. The purpose of a bag limit is to ensure that the recreational allowance is not exceeded. The bag limit may also act as a means by which the sustainability of the fishery is ensured. For a number of stocks introduced under this process there is no current bag limit. The need to set a bag limit may be averted in the short term where the recreational allowance is based not on current catch but takes into future recreational interests in the resource. In the immediate term it may be unlikely that the recreational allowance for some stocks will be exceeded even in the absence of a bag limit.

Māori Customary Non-Commercial Allowance

- 74 There are no quantitative estimates of the size of Māori customary non-commercial catch for any of the stocks. Where estimates of customary catch of the new species is available from permits or authorisations under customary fishing regulations that information has been taken in to account. However, as noted above, the current level of catch may not entirely reflect the importance of the resource to customary fishers. Where estimates are not available but there is known to be customary catch, a nominal allowance has been made. In some instances the customary interest is considered to be greater than the level of recreational catch and that is reflected in the respective allowances. For stocks of importance to customary Māori the allowance is based on the level of the recreational catch. For species and stocks where there is some catch but the stock is not considered of importance to customary Māori then the allowance is based on half the recreational catch. Where there is no catch and negligible if any interest in the stock, such as for deepwater species, no explicit allowance is proposed. In all instances the allowance proposed also takes into account the factors identified above. MFish notes that the allowance made for customary fishers is not intended to act as a constraint of the level of catch taken.

All Other Fishing Related Mortality

- 75 No quantitative information is available to assess the level of all other fishing related mortality applicable to the new species or to attribute such mortality to a particular sector group. However, some level of mortality may occur as a result of the particular method use to exploit a stock. Where appropriate MFish proposes to make an allowance for all other mortality to a stock caused by fishing. In addition MFish

proposes that the allowance for other fishing related mortality be deducted from the allowance for a particular sector that is primarily responsible for the mortality.

Total Allowable Commercial Catch

- 76 The TACC for the new species has been proposed on the basis of the criteria used to determine the TAC in the absence of stock assessment information. The criteria applied are:
- a) Existing CLs or CCLs; or
 - b) Average catch based on a stable or developing fishery classification; or
 - c) Potential development opportunity.
- 77 Where sustainability concerns exist as to the level of total landings, the TACC has been modified appropriately. In all instances the TACC proposed also takes into account the generic factors identified above.
- 78 The Act provides that under specific circumstances foreign licensed access to a stock is to be provided within the TACC set for a stock. Foreign access is to be provided to that portion of the TACC held by the Crown where the quota is not tendered off and the ACE remains unsold after the Crown has offered the ACE for sale to persons entitled to own quota. MFish intends to undertake formal tenders for any quota and ACE allocated to it post introduction of these species into the QMS. Where a TACC is set in excess of the current commercial catch there is the potential in some stocks for some ACE to remain unsold as from 1 October 2003. Technically this could be made available to foreign vessels through the Minister establishing a foreign allowable catch under s 81 of the Act. Practically, there may be limited interest in fishing small quantities of fish available to foreign vessels. Other Management Controls.
- 79 The TAC is invariably supported by a number of management controls that collectively ensure the sustainability of the stock and provide for utilisation within accepted limits. The Act explicitly provides for the setting of sustainability measures relating to size limits, biological state, fishing seasons, methods restrictions, closed areas, plus measures such as overfishing thresholds and bag limits.
- 80 The species-specific papers set out those measures that currently apply which are being retained as part of the management framework for the stock under the QMS. The general intent is for the species-specific papers not to undertake a widescale review of all existing measures or potential measures that could be adopted. The ideal opportunity to discuss such issues will arise when quota is taken up by fishers and potentially within the context of development of a fisheries plan. However, where necessary, consideration of appropriate measures, such as method restrictions, is outlined.

Setting of Deemed Values and Overfishing Thresholds

- 81 A separate section in this document outlines the general principles relating to the setting of interim and annual deemed values for QMS stocks. The section contains information from a port price survey and sets out the interim and annual deemed values proposed for each of the species to be introduced in the current process.

- 82 The section also contains information about the setting of overfishing thresholds and tolerance levels for the stocks to be introduced to the QMS on 1 October 2004.

Cost Recovery

- 83 The Act provides a framework where certain costs of the Crown in delivering fisheries services or conservation services may be recovered from the commercial fishing industry. In summary these costs arise from research activities, administration of the QMS, enforcement activities delivered by (or through) MFish or in respect of conservation services delivered by the Department of Conservation. The services to be delivered in each of these areas are subject to annual consultation with stakeholders.
- 84 Having determined that some of the Crown's costs can be recovered the allocation of these costs is determined by the Fisheries (Cost Recovery) Rules 2001. In general the costs of research are targeted towards the fishery (or group of fisheries) to which specific research programmes relate. The costs of QMS administration and enforcement are generally targeted to quota holders. Therefore, upon introduction into the QMS, commercial quota owners will face some proportionate costs in these areas.
- 85 In a more general sense, cost recovery is a key fisheries management tool. The intent of commercial fishers meeting the full costs associated with access and property rights is to encourage rational business decisions that provide for the good husbandry of the resource. Following introduction to the QMS, fishers will have the opportunity to consider future management options including potential trade-offs that may be available between further research (with associated costs) and increased catch levels.

Regulatory Framework

- 86 The intent of the quota management system is to provide a broad management framework that provides the opportunity to maximise efficient utilisation of fishing resources while ensuring sustainability. The introduction of a species into the QMS requires that a TAC and other management controls are set in order to ensure overall sustainability of the species. Certain controls in place for these species will no longer be required following implementation of QMS management measures. The review of regulations prior to introduction will ensure that regulations inconsistent with the QMS management regime are removed.

PROPOSAL TO INCLUDE NEW QMS SPECIES ON SCHEDULE THREE OF THE FISHERIES ACT (1996)

Purpose

- 1 The Ministry of Fisheries is proposing to set TACs for a number of new QMS species under s. 14 of the Fisheries Act (1996). This paper proposes including these new QMS species on the Third Schedule of the Act by Order in Council as is required prior to management under s. 14.

Background

- 2 Under s. 14 there is no requirement to manage stocks in accordance with MSY, although any TAC set must ensure the stock is sustainable. A TAC can only be set under s. 14 for stocks listed on the Third Schedule by Order in Council.
- 3 Stocks can be listed on the Third Schedule if they meet one or more of the following criteria:
 - i. it is not possible to estimate MSY because of the biological characteristics of the species; or
 - ii. a catch limit for New Zealand has been determined as part on an international agreement; or
 - iii. the stock is managed on an enhanced or rotational basis.
- 4 The Ministry of Fisheries considers that all of the species proposed for management under s. 14 meet at least one of the above criteria. Analysis of the species relative to the criteria is outlined below.

Legal Advice

- 5 The Ministry of Fisheries has received legal advice that you can proceed with decisions on management under s. 14 in advance of these species being listed on the Third Schedule providing the Order in Council is in force before 1 October 2004.
- 6 The Ministry of Fisheries will be amending the Third Schedule as part of the larger package of regulatory proposals timed for implementation on 1 October 2004. The timetable for the regulatory changes will ensure that the Order in Council is progressed before 1 October 2004.

Southern Bluefin Tuna (*Thunnus maccoyii*)

- 7 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species and a catch limit for New Zealand has been determined as part of an international agreement. Southern bluefin tuna is a single

stock that occurs primarily between 30°S and 50°S in the South Atlantic, Indian and southwest Pacific Oceans. Furthermore, the stock is managed through the Convention for the Conservation of Southern Bluefin Tuna. This agreement includes setting catch limits and country allocations that apply to New Zealand.

Bigeye Tuna (*Thunnus obesus*)

- 8 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species. This species is widely distributed throughout tropical and subtropical waters of the Pacific, Atlantic and Indian Oceans. Bigeye tuna caught in New Zealand are part of a single Pacific stock. As yet there are no specific international obligations with regard to the management of this species.

Yellowfin Tuna (*Thunnus albacares*)

- 9 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species. Yellowfin is highly migratory and those found in New Zealand waters are part of a single western and central Pacific Ocean stock, this stock is separate from the yellowfin tuna stock of the eastern Pacific Ocean. As yet there are no specific international obligations with regard to the management of this species.

Pacific Bluefin Tuna (*Thunnus thynnus orientalis*)

- 10 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species. This species is part of a single stock distributed primarily in the northern Pacific Ocean. Most catch is taken off Japan and California although they do occur as far south as Chile and New Zealand. As yet there are no specific international obligations with regard to the management of this species.

Swordfish (*Xiphias gladius*)

- 11 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species. The swordfish is a cosmopolitan oceanic species, although the stock structure has yet to be determined. It has been postulated that the Pacific Ocean consists of a number of separate stocks, however, genetic studies do not support this hypothesis. As yet there are no specific international obligations with regard to the management of this species.

Moonfish (*Lampris guttatus*)

- 12 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species. Moonfish occur in tropical and temperate waters in all major oceans. They are known to be wide ranging but the degree to which they inhabit New Zealand waters is not known. It is likely that the moonfish in New Zealand waters are one biological stock. As yet there are no specific international obligations with regard to the management of this species.

Mako Shark (*Isurus oxyrinchus*)

- 13 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species. This species is highly migratory and is found over a wide portion of the Pacific Ocean. The degree to which populations are resident in New Zealand waters is not known but those in New Zealand waters are thought to be part of a single biological stock that probably ranges as far as Australia to the west and possibly as far as French Polynesia to the east. As yet there are no specific international obligations with regard to the management of this species.

Ray's Bream (*Brama brama*)

- 14 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species. Ray's Bream is a highly migratory species with a wide distribution. It is found in the North Atlantic Ocean and throughout the sub-tropical to sub-Antarctic waters in the South Pacific. As yet there are no specific international obligations with regard to the management of this species.

Porbeagle Shark (*Lamna nasus*)

- 15 This species meets the criteria as it is not possible to estimate MSY because of the biological characteristics of the species. Porbeagle sharks are distributed from sub-Antarctic to temperate waters. Those found around New Zealand are probably a single stock that ranges as far as Australia, the sub-Antarctic Islands and the Indian Ocean. As yet there are no specific international obligations with regard to the management of this species.

Recommendation

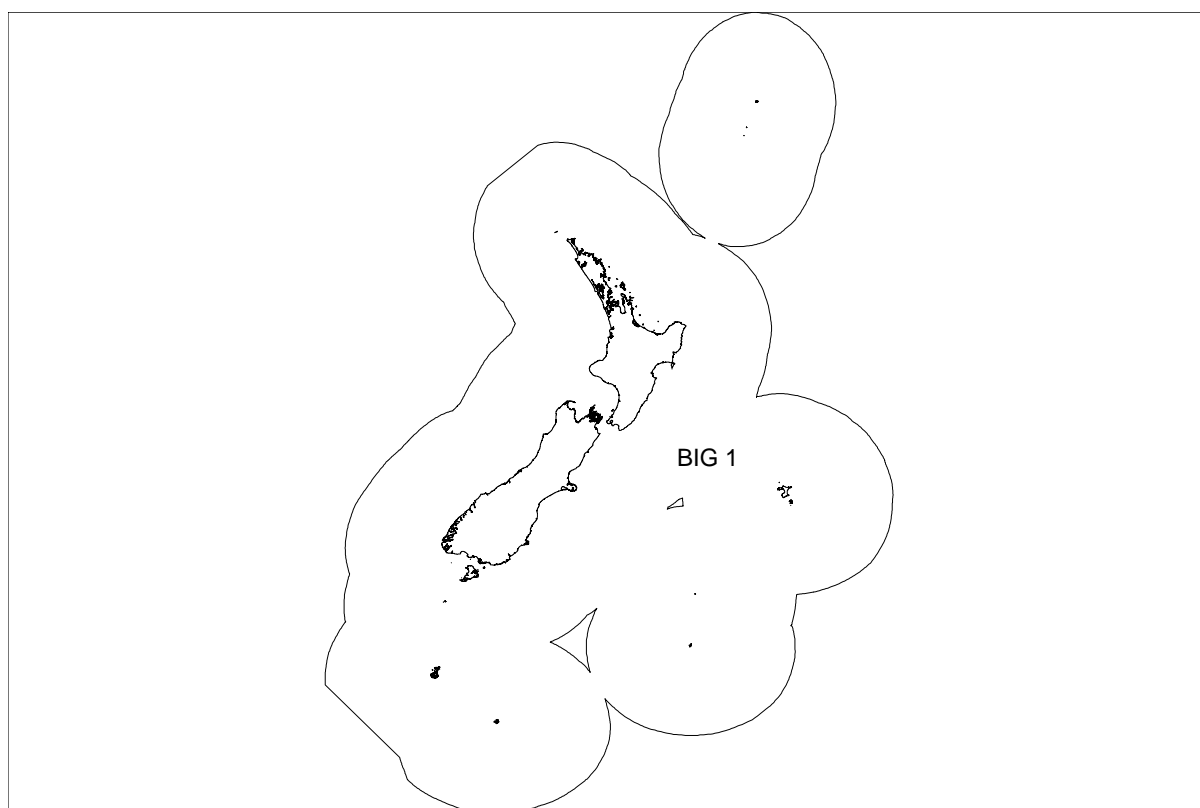
- 16 It is recommended that you:
- a) **Agree** to proceed with decisions on TACs for stocks outlined above in advance of those stocks being listed on the Third Schedule of the Fisheries Act 1996.
 - b) **Note** that separate advice will be provided to you on the regulatory amendments required as a consequence of the above 9 species being introduced into the QMS on 1 October 2004.

BIGEYE TUNA (BIG) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Bigeye tuna (*Thunnus obesus*) has been gazetted for introduction into the QMS on 1 October 2004. The Quota Management Area for bigeye tuna, shown in Figure 1, includes all New Zealand fisheries waters (FMAs 1-10). The fishing year for bigeye tuna will be from 1 October to 30 September in the following year. The total allowable commercial catch (TACC) and annual catch entitlement (ACE) are to be expressed in terms of kilograms greenweight.

Figure 1: Quota Management Area for bigeye tuna



Key Issues to be Considered

- 2 Key issues related to the decisions on sustainability and other management controls for bigeye are as follows:
 - a) Bigeye tuna taken in New Zealand fisheries waters are part of a Pacific wide stock;
 - b) Bigeye tuna is taken in New Zealand fisheries waters primarily by the method of tuna longline;
 - c) There is international concern with respect to the status of the bigeye tuna stock in some areas of the Pacific;

- d) Catches of bigeye tuna in New Zealand fisheries waters have declined substantially in recent fishing years, however the reasons for this decline are uncertain and may relate to environmental factors;
- e) There are associated target and bycatch fisheries that will be introduced into the QMS at the same time as bigeye tuna; and
- f) A key objective for introducing bigeye into the QMS in advance of the setting of an international catch limit is to achieve rationalisation and provide for rational development in the fishery.

List of Management Options

- 3 It is proposed to add bigeye tuna to the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
- 4 There are two options proposed for TAC, allowances and TACC for bigeye tuna. These are:

Table 1: Proposed TACs, TACCs, and allowances for bigeye tuna (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC *
BIG 1	606	4	8	12	582
OR					
BIG 1#	725	4	8	14	699

*:based on the best annual catch of the most recent five years (466 tonnes) plus 25% (Option 1) or 50% (Option 2).

MFish preferred option.

- 5 A deemed value of \$11.54 per kg is proposed for bigeye tuna.
- 6 It is proposed that differential deemed values apply for bigeye tuna.
- 7 Consequential amendments to the Fisheries (Reporting) Regulations 2001 are proposed.

TACS Allowances and TACCs

TAC management strategy

- 8 Section 14 of the 1996 Act provides an exception to setting a TAC based on an assessment of MSY where the Minister is satisfied that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2).
- 9 It is not possible to estimate MSY for the part of the bigeye tuna stock that is found within New Zealand fisheries waters. This is one of the criteria for the inclusion of a stock on the Third Schedule (s 14(8)).
- 10 It is therefore proposed that a TAC for bigeye tuna is set pursuant to s 14 of the 1996 Act. While any TAC must be set in a way that ensures use of the stock is sustainable, there is no requirement under s 14 to take into account or be guided by the need to manage in accordance with MSY. A TAC set under s 14 of the Act must be set in a

way that better achieves the purpose of the 1996 Act. MFish believes that a TAC set under the provisions of s 14 of the 1996 Act can better provide for utilisation (developing fisheries to enable people to provide for their social, economic and cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters, whilst at the same time ensuring sustainability.

- 11 Further, s 14 provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

Rationale for proposed TACs

- 12 In the absence of estimates of the available harvest of bigeye tuna in New Zealand fisheries waters, a TAC is proposed that is based on current harvest levels for each sector (either reported or based on a nominal allowance) plus a proportional amount to provide for further commercial development of the fishery.
- 13 In the absence of estimates of non-commercial catch nominal allowances are proposed for recreational fishing and customary Māori fishing. The best annual commercial catch of bigeye tuna in the most recent five years is 466 tonnes. The two TAC options proposed are based on a TACC increased by 25% of this amount (Option One) or by 50% of this amount (Option Two). These percentage increases are arbitrary but considered to represent potential levels of development in the fishery.
 - Option One: 606 tonnes
 - Option Two: 725 tonnes
- 14 Comment from fishers on the status of the fishery is mixed. Some suggest that catches of bigeye tuna may have been constrained as fishers spend a proportion of their time within a fishing year competing for southern bluefin tuna. This would suggest that potential of the bigeye tuna fishery within New Zealand fisheries waters has therefore not been fully explored, particularly in the Kermadec FMA where the fishery has only been lightly exploited by domestic fishers.
- 15 Other fishers suggest that bigeye tuna is in decline within New Zealand fisheries waters. It is not known however whether recent declines in landings of bigeye tuna relate to environmental factors influencing the availability of this species within New Zealand fisheries waters.
- 16 International assessments suggest that there are sustainability concerns in relation to fishing for this species in the equatorial Pacific region. These concerns relate primarily to recruitment overfishing and longlining in tropical areas of the Pacific. The same trend is not apparent for temperate areas of the fishery. New Zealand has an obligation (voluntary) to exercise reasonable restraint in the development of its fisheries for highly migratory stocks. Despite this MFish considers that it is reasonable to provide for some expansion in the level of the bigeye tuna fisheries within New Zealand coastal waters. New Zealand catches are small with respect to those from the total Pacific and suggestions of sustainability concerns in temperate waters are less clear. Policy guidelines suggest that the opportunity for development and the extent of utilisation provided for needs to be assessed on a stock-by-stock basis having regard to the risk based on the following factors:

- 17 **Sustainability of the stock**, for bigeye tuna the risk is considered low to moderate. Sustainability concerns suggest that the lower of the two options for TAC proposed presents the least risk. However in the context of Pacific wide catches the difference between the two options is not considered to be significant.
- 18 **Biology of the stock and potential for local depletion**, this risk is not yet apparent for bigeye in more temperate regions of the Pacific.
- 19 **Impacts of fishing on the aquatic environment including bycatch**, for bigeye tuna this is a factor of moderate risk. Bigeye tuna is taken in conjunction with other large tuna species including southern bluefin tuna and any increase in catch creates some risk that southern bluefin tuna may be caught over and above the catch limit set for this species. This risk will be mitigated if, as anticipated, there is a change in the fishery for southern bluefin tuna from being a target species to a mix of target and bycatch.
- 20 Bycatch species are also proposed for entry into the QMS at the same time. While bycatch species should not unnecessarily constrain catches of the target species there is a need to consider the impacts on associated species of any expansion in catch. A stepwise expansion of the fishery is indicated on this basis.
- 21 **Socio economic and cultural issues**, with regard to bigeye tuna there are clear benefits to the fishery if an expansion in catch can be realised and sustained. Bigeye tuna is a valuable species and revenues from the fishery will increase and there will be an economic benefit to the nation as a whole. However, a key rationale for introducing bigeye tuna into the QMS was an improvement in the economic efficiency of the fishery. The setting of a TAC and TACC beyond the capacity of the fleets harvest is likely to have a number of consequences including:
- The benefits of rationalisation of the fishery are put at risk
 - The value of quota is undermined.
- 22 There are no known areas of the fishery where there is likely to be an interaction between commercial and non-commercial fishing. This suggests that the risks associated with an expansion in commercial catch on the fishing interests of other sectors are low.
- 23 **Anecdotal information on abundance and size of likely habitat in the management area** is mixed. Some anecdote suggests a decline in the fishery and is supported by the trends in reported catch and the international assessment of the bigeye stock. Other anecdote suggests declines in catch may only be environmentally related and that declines in abundance in the known areas of the fishery are only temporary. Further, the Kermadec FMA is an area that has only been lightly fished for bigeye tuna by domestic fishers. Anecdote and historical foreign licensed catch suggest this area provides expansion potential for the fishery. MFish notes however this potential can only be realised if fishers actually fish in this area rather than remaining in the known grounds of the coastal fishery.
- 24 On balance, the risks associated with an increase in commercial catch of bigeye tuna are considered to be low to moderate. The choice of TAC options is dependent on the level of risk associated with the development of the fishery. MFish has not proposed

options higher than a fifty percent increase on the best years catch until more is known about the distribution and abundance of bigeye tuna in New Zealand fisheries waters and the potential fishery interactions with other target and non-target species. MFish considers that the increased risks associated with the higher of the TAC options proposed are manageable. MFish has an initial preference for the higher TAC option of 725 tonnes.

- 25 MFish notes that there is provision for an in season increase in TAC if the abundance of bigeye tuna in any fishing year suggests that more may be taken. Any in-season increase is given effect through the creation of ACE pursuant to s 68 of the 1996 Act.
- 26 Further the annual TAC and TACC is subject to review based on the performance of the fishery. If the TAC proves to be limiting the development of the fishery (eg, it is consistently fully caught) then there is an annual opportunity to consider proposals for a TAC increase.

Proposed allowances and TACC

Customary Māori and recreational allowances

- 27 There are no estimates of non-commercial catch of bigeye tuna. It is known that bigeye tuna is an occasional catch of big game fishing. A nominal allowance for recreational fishing of 8 tonnes is proposed.
- 28 There is no known customary catch of bigeye tuna. Bigeye tuna is likely to have been taken as a customary catch in the past but it is not known to be a species of particular significance to Māori. A nominal allowance of 4 tonnes (50% of the recreational allowance) for customary fishing is proposed.

Allowances for other sources of mortality

- 29 Observer information on discard practises in the tuna longline fishery is available from the 1990s. This information suggests that for bigeye tuna 6.1% of the catch was discarded and 0.8% was lost before landing. The primary reasons for discarding were because of damage. While discarding of damaged bigeye tuna will be unlawful once this species is in the QMS an allowance for other sources of mortality is considered to be required. The percentage estimates above are by number. No estimates by weight are available. Given that MFish anticipates a change in discard practise once bigeye tuna are introduced into the QMS a nominal allowance for other sources of fishing mortality of 2% of the TACC by weight is proposed for fish that are lost before landing.

TACCs

- 30 TACCs are proposed based on current utilisation increased to provide for development opportunity in the fishery. Options are an increase of 25% over and above the best annual catch over the most recent five years (466 tonnes) or an increase of 50% over and above the best annual catch.
 - Option One: 582 tonnes
 - Option Two: 699 tonnes

- 31 MFish assesses that the level of risk associated with the higher TAC option proposed is manageable and that the international concern regarding the status of this fishery relates primarily to recruitment overfishing and to fishing in tropical areas of the Pacific. Option Two, a TACC of 699 tonnes is the MFish preferred initial position.

Other Management Measures

- 32 Specific measures are proposed in respect of:
- Providing for inclusion of bigeye tuna on the Third Schedule (by Order in Council) as a species for which it is not possible to estimate MSY;
 - Making consequential amendment to the fisheries reporting regulations; and
 - Setting a deemed value for bigeye tuna.

Inclusion of bigeye tuna on the Third Schedule

- 33 MFish proposes that bigeye tuna be added to the Third Schedule of the 1996 Act.
- 34 Bigeye tuna is a highly migratory species caught in New Zealand waters but part of a stock that includes the entire South Pacific. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. One of the criteria for inclusion of a stock on the Third Schedule is therefore satisfied.
- 35 Section 14 of the Act requires that species managed under s 14 be listed on the Third Schedule of the 1996 Act by Order in Council. Section 14 of the 1996 Act provides for the setting of an alternative TAC if the purpose of the Act is better achieved than by setting a TAC pursuant to s 13(2).

Consequential amendment to regulations

- 59 As a consequence of the introduction of bigeye tuna into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this document.

Deemed Values and Overfishing Thresholds

- 60 A separate section of this document sets out generic information on the setting of interim and annual deemed values.
- 61 Despite the high value of bigeye tuna, MFish considers that the best fit for this species is the category of all other stocks for which the deemed value would be 75% of port price. The port price for bigeye tuna is \$15.38. An annual deemed value of \$11.54 is proposed. It is further proposed that differential deemed values apply.
- 62 MFish does not propose to set an overfishing threshold for bigeye tuna, unless monitoring of catch against the TACC suggest that this is required in the future.

Statutory Considerations

- 63 The management options presented for bigeye tuna seek to better achieve the purpose of the 1996 Act (s 14) by providing opportunity for further utilisation (development) within what should be a sustainable catch of this species within New Zealand fisheries waters balanced against an obligation to exercise reasonable restraint in the development of the fishery. (s 8). The proposals are considered to be consistent with New Zealand's international obligations in relation to fishing and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5).
- 64 Bigeye tuna is taken as both a target and bycatch species of tuna longline fishing. A wide range of fish species are taken as bycatch of tuna longline fishing. Catch levels vary but many of these species are only rarely taken. The main fish bycatch species associated with the surface longline fishery within New Zealand fisheries waters are to be introduced into the QMS. This will provide the mechanisms for sustainability actions as required. (ss 9(a) and (b)).
- 65 There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of bigeye tuna into the QMS will improve our ability to address these issues by requiring the incorporation of new information as it comes to hand in the process of determining catch limits for the fishery.
- 66 There are known effects of tuna longline fishing on the aquatic environment (seabirds) but steps have been and continue to be taken to mitigate these risks (refer Annex Two) (s 9(b)).
- 67 Bigeye tuna is not known to be a highly variable stock, however the availability of bigeye tuna within New Zealand fisheries waters is known to vary both seasonally and on an annual basis (s 11(1)(c)). Environmental factors are likely to influence the distribution of bigeye tuna in New Zealand fisheries waters.
- 68 Tuna longlining is not known to pose a risk to benthic habitat of particular significance to fisheries management. The pelagic habitat, however, and any associated risks of fishing are poorly understood (s 9(c)).
- 69 Before setting any sustainability measure, the Minister must have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, and any management strategy or management plan under the Conservation Act 1987 that applies to the coastal marine area and is considered to be relevant by the Minister. MFish is not aware of any provisions in any strategy or planning document under the Resource Management Act or Conservation Act that are relevant to the setting of sustainability measures for bigeye tuna (s 11(2)(a) & (b)).
- 70 Similarly, before setting any sustainability measure relevant to the Hauraki Gulf (eg, a TAC for the bigeye tuna), the Minister must have regard to s 7 and s 8 of the

Hauraki Gulf Marine Park Act 2000 Act. The Hauraki Gulf is defined in that Act to include all coastal waters and offshore islands from near Te Arai Point offshore to the Moko Hinau Islands, and south to Homunga Point (north of Waihi Beach). This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. Bigeye tuna is not known to occur in the waters of the Hauraki Gulf Marine Park, however, MFish considers that the setting of sustainability measures for bigeye tuna will better meet the purpose of the Act, and ensure that the range of values associated with the use of the bigeye tuna resource are enhanced for the people and communities in the area (s 11(2)(c)).

- 71 Before setting any sustainability measure, the Minister must also take into account any conservation services or fisheries services, any relevant fisheries plan approved under the Act, and any decisions not to require conservation services or fisheries services. There are no relevant fisheries plans approved that would have any bearing on the setting of a TAC for bigeye tuna. Conservation and fisheries services apply to tuna fisheries generally in order to assess and monitor the impacts of fishing on non target fish and non-fish species. Further, there have been no decisions not to require conservation services or fisheries services (s 11(2A)).
- 72 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaimai reserves exist within BIG 1 the values of the mātaimai will not be compromised as bigeye tuna are part of an oceanic stock. No area has been closed or fishing method restricted for customary fishing purposes in BIG 1 that would affect the fishery. No restrictions have been placed on fishing in any area within the BIG 1 for recreational interests (ss 21(4) and (5)).
- 73 The information used to develop proposals for bigeye tuna relies on overseas assessments of the stock (which are uncertain and relate primarily to tropical areas of the fishery) and information from commercial catches, which is limited with respect to evaluating levels of sustainable harvest. MFish notes however that uncertainty in information is not a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act.

Preliminary recommendations

- 74 MFish recommends that the Minister:
- a) **Agrees** that the purpose of the 1996 Act is better achieved by setting a TAC for bigeye tuna otherwise than in accordance with s 13(2).
 - b) **Agrees** to add bigeye tuna to the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
 - c) **Agrees** to set a TAC for bigeye tuna of 725 tonnes and within this set:
 - i) A customary allowance of 4 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance of 14 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 699 tonnes.

- d) **Agrees** to set a deemed value for bigeye tuna of \$11.54 per kg.
- e) **Agrees** that differential deemed values apply.
- f) **Agrees** to consequential amendments to reporting regulations to reflect the decision to introduce bigeye into the QMS.

ANNEX ONE

Species Information

Species biology

- 75 Bigeye tuna is a member of the family Scombridae (tunas and mackerels), which includes five species of *Thunnus* known in New Zealand. They occur in oceanic waters from the surface to about 250 m depth.
- 76 Bigeye tuna caught in New Zealand are part of a single Pacific-wide stock. This stock occurs throughout the Pacific Ocean, from about 30°N to 40°S. Bigeye tuna are found in waters of 13–29°C, with an optimum range of 17–22°C and spawn in spring and early summer months mostly between 10° S and 30° N west of 160°W.
- 77 A maximum fish size for bigeye tuna of 200 cm fork length and 197 kg has been reported. Longline caught bigeye tuna are usually 100–170 cm in length and purse seine caught bigeye tuna are 40–80 cm in length.
- 78 Bigeye tuna is listed as a highly migratory species in Annex 1 of the United Nations Convention on the Law of the Sea and by reference in the Western and Central Pacific Fisheries Convention (WCPFC). Participating countries in the Preparatory Conference establishing the Western and Central Pacific Fisheries Commission (Commission) have urged states to exercise reasonable restraint in respect of any increase in fishing effort and capacity with regard to the reported status of highly migratory stocks. As yet there are no specific international obligations with regard to the management of bigeye tuna.

Fisheries characteristics

Commercial catch

- 79 Bigeye tuna are widely targeted by longline fisheries throughout the Pacific, and juveniles are caught as bycatch in purse seine fisheries in the equatorial regions of the central and western Pacific.
- 80 Adult bigeye tunas are taken in New Zealand in the surface longline fishery. Observer data from longline vessels shows that the size range of fish caught in New Zealand waters ranges from 78 to 190 cm with a mean of 130 cm fork length. The distribution is bimodal with peaks at 120 cm and 140 cm fork length.
- 81 The bigeye catch in New Zealand fisheries waters is less than one percent of that taken in the western and central Pacific Ocean. The distribution of reported catches within New Zealand waters is shown in Table 2. Historical catch records for foreign licensed fleets suggest that higher catches than those reported by the current domestic fleet are achievable.

Table 2: Catch history of bigeye tuna in NZ by fishing year and FMA

Fish Yr	FMA1	FMA2	FMA3	FMA4	FMA5	FMA6	FMA7	FMA8	FMA9	FMA10	ET	U	Total	LFRR
NZ Domestic & Charter fleets														
1989/90	8.7	2.3								1.7	0.4		13.1	31
1990/91	12.5	0.8											13.3	36
1991/92	25.7	4.6							9.9	1.4	0.8	0.7	43	50
1992/93	33.3	6.6							3.9		2.2	0.1	46	49
1993/94	49.6	9.9							4.3	6.7	6.1	0.4	77	89
1994/95	37.1	7.7							1.1	2.3	0.5		48.8	50
1995/96	39.6	27.8		0.1			0.1		1.9	1.4	0.7	0.4	72.1	79
1996/97	61.6	18.2			0.1			0.1	11.6	0.1	0.2	0.5	92.4	105
1997/98	221.3	26.2					0.1	0.1	25.4	0.1	2.6	1.8	277.5	340
1998/99	244.2	37.4					0.1	1.5	27.3	0.1	1.4	2.6	314.5	391
1999/00	276.5	48.6						0.8	87.1	4.9	7.6	0.8	426.2	466
2000/01	243.2	62.9					0.1	1.6	100.3	21.6	13.6	0.6	443.8	463
2001/02														276
2002/03														194
Total	1253	253	0	0.1	0.1	0	0.4	4	272.7	40.2	36	7.9	1 868	2619
Foreign licensed vessels (Japan)														
1979/80	65.9	15	0.5						93.5	30.9	67.1		272.9	
1980/81	51.6	43.8							183	117.4	47.1	0.1	443	
1981/82	360.9	42.5					0.4		121.9	127.2	24.9	2.4	680.2	
1982/83	139.8	31		1					90.5	173.7	48.5	1.1	485.7	
1983/84	313.2	36.4	10.4						46.6	160.3	10.7	0.1	577.7	
1984/85	202.1	65.2							180	59	45		551.2	
1985/86	134.1	55.4							234.6	197.5	90.2		711.7	
1986/87	94.6	32.6							144.5	264.3	144	0.1	680.1	
1987/88	113.8	30							37	46	19.7	0.1	246.6	
1988/89	55.6	23.5							27.8	58.7	9.9		175.5	
1989/90	109	28.4	0.2		0.1				51.7	113.2	40.1	0.1	342.8	
1990/91	67.2	4.3							37.5	36.6	11.8		157.5	
1991/92	27.1	8.2			0.4				41.5	0.8	5.7		83.7	
1992/93	3.2	0.1			0.1								3.3	
Total	1738	416.4	11.1	1	0.5	0	0	0.4	1 290	1 386	564.5	4	5 412	
Foreign licensed vessels (Korea)														
1980/81	0.3								1.9	8.4	0.3		10.9	
1981/82	0								0.1	6.3	0.5		6.8	
1982/83	0									0.3		0.4	0.7	
1983/84	0.4								2.5	1.2	0.7	0.1	4.9	
1984/85	0.1								2.4	2.9	2.2		7.6	
1985/86	0								2.8		1.1		4	
1986/87	0.3								1.2	0.4	0.9		2.7	
1987/88	0.7								0.7	2.3	0.2		3.8	
1988/89	0								0.3	0.1			0.4	
Total	1.7	0	0	0	0	0	0	0	11.9	21.8	5.8	0.5	41.7	

Recreational and customary catch

82 There are no estimates of non-commercial catch. Bigeye tuna is an occasional and highly prized catch in the recreational gamefish fishery. There is no documented customary fishery for bigeye tuna although Māori are likely to have taken bigeye tuna on occasion in the past.

Regulatory framework

- 83 Specific regulatory measures apply to the bigeye tuna fishery with respect to the operation of foreign owned vessels registered to fish within New Zealand fisheries waters. These regulations include a provision excluding the use of foreign owned tuna longline vessels within territorial waters year round and in the Auckland Fisheries Management Area from 1 October to 31 May in the following year. The latter provision is part of a number of linked management measures collectively known as the “Billfish Moratorium” initiated in response to recreational concerns over access to billfish resources. These are general controls relating to tuna longlining rather than being controls specific to fishing for bigeye tuna.

Fisheries assessment

- 84 The Preparatory Conference for the Commission for the Conservation of Highly Migratory Stocks in the Central and Western Pacific (Prepcon) has charged a scientific coordinating group with providing interim scientific advice on the status of Pacific tuna species. A working group (WGII) of the Prepcon has considered recent scientific advice on the stock status of bigeye tuna and has reported the results as follows:

‘Overall the long line fishery has had the largest impact on the bigeye stock. Significant impacts also stem from the purse seine fishery, and increases in the Philippine and Indonesian fisheries. In 2002, SCG 1 noted that any increases in fishing mortality on juvenile bigeye “are likely to move the stock to an overfished state.” The 2003 stock assessment suggests that current fishing mortality on juveniles and adults is not sustainable. SCG 2 recognized that uncertainty surrounding the 2003 assessment means that the true status of bigeye stocks may be overestimated or underestimated. However, given the possible worsening status of the bigeye stock, WG.II recommends that the concept of the precautionary approach should be applied. The most practical immediate management recommendation in support of this approach would be to ensure there is no increase in fishing mortality on bigeye. If future stock assessments confirm the 2003 assessment results, managers would need to implement practical management actions to decrease fishing mortality to prevent further decline in the stock’.

- 85 Within New Zealand fisheries waters there is anecdote to suggest that catch rates for bigeye tuna have progressively declined over recent years. This anecdote is supported by the substantially lower catches of bigeye for the last two fishing years. As a counter balance to this is the fact that there has been little fishing for bigeye tuna in the Kermadec FMA. Based on historical catches of the foreign licensed fleet this area has expansion potential. Further, it is not known whether or not the recent declines in catch are a feature of environmental conditions that affect the movement of bigeye into New Zealand fisheries waters rather than a change in the abundance of bigeye tuna overall.

Associated fisheries

- 86 In New Zealand waters bigeye is primarily taken by surface longline. It is a target species at certain times and in certain areas. In other areas and at other times it is a

bycatch of tuna longline fishing for other tuna species such as southern bluefin tuna and albacore.

- 87 Key associated fisheries are proposed for introduction into the QMS for 1 October 2004. The main target species of tuna longline fishing are bigeye tuna, southern bluefin tuna and albacore. Southern bluefin tuna and bigeye tuna are to be introduced into the QMS on 1 October 2004. Albacore will be proposed for introduction into the QMS on 1 October 2005.
- 88 Key bycatch species are swordfish, mako shark, blue shark, porbeagle shark, moonfish, Ray's bream and yellowfin tuna. These species are also to be introduced into the QMS on 1 October 2004. There is a need to consider and monitor the interaction between target tuna species and bycatch catch levels to ensure that overall the fishery is not unnecessarily constrained.
- 89 There is also a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of bigeye tuna into the QMS will improve our ability to address these issues by requiring the incorporation of any new information as it comes to hand in the process of determining catch limits for the fishery.

Aquatic Environment

- 90 There is also a non-fish bycatch associated with the surface longline fishery. Fishing vessels sometimes capture seabirds that are chasing baited hooks, and the seabirds drown as the lines sink. Seabirds are also caught in trawl and other fisheries, but longliners are considered to be the main threat to several vulnerable albatrosses and other seabird species. The risks of seabird capture vary geographically and by species. An active programme is underway to mitigate and monitor the capture of seabirds in surface longline fisheries.
- 91 MFish has established standard environmental controls on line and trawl target fisheries to mitigate the impact of these fishing methods on seabirds. These include prohibitions on net sonde monitor cables and compulsory reporting of bycatch of protected species. New Zealand surface longline vessels are required to use tori lines of a specified standard. Vessels are using a variety of practices to reduce seabird bycatch including the use of artificial baits and the practice of setting longlines at night.
- 92 MFish and the Department of Conservation are developing a National Plan of Action (NPOA) for Seabirds that is expected to include measures that will apply to all New Zealand fishing vessels.
- 93 Harvesting of bigeye tuna may have impacts with regard to predator/prey interactions and trophic dynamics, as bigeye tuna feed on a wide range of species, including cephalopods, crustaceans, fish (most commonly skipjack tuna and lancetfish) and squid. Understanding of food web relationships is still at an early stage, but MFish

considers that, if evidence emerges of impacts on biodiversity from harvesting of bigeye tuna, this can be managed at the time based on international cooperation where appropriate.

Current and potential research

- 94 There is no current or proposed research for bigeye tuna in New Zealand waters. New Zealand actively participates in the process to assess this species in the Central and Western Pacific and catch information from the New Zealand fishery is provided in support of this process as required. Internationally efforts are focussed on reducing the uncertainty in stock assessments for bigeye tuna.

Social cultural and economic factors

- 95 The bigeye tuna fishery in New Zealand is of considerable value and there are clear benefits associated with any potential to further develop the fishery. While highly prized as a gamefish, bigeye tuna is not a regular catch of recreational fishers and the prospects for conflicts between sectors is low. Bigeye tuna is not known to be a species of particular significance to Māori customary fishing.

BIGEYE TUNA (BIG) – FINAL ADVICE

Initial Proposals

- 1 It was proposed to add bigeye tuna to the Third Schedule and set a TAC pursuant to section 14 of the Fisheries Act 1996 (the 1996 Act).
- 2 There were two options proposed for TAC, allowances and TACC for bigeye tuna. These were:

Table 1: Proposed TACs, TACCs, and allowances for bigeye tuna (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC *
BIG 1	606	4	8	12	582
OR					
BIG 1#	725	4	8	14	699

*.based on the best annual catch of the most recent five years (466 tonnes) plus 25% (Option 1) or 50% (Option 2).

MFish preferred option.

- 3 It was further proposed:
 - a) To set a deemed value of \$11.54 per kg for bigeye tuna;
 - b) That differential deemed values apply for bigeye tuna; and
 - c) Consequential amendments are made to the Fisheries (Reporting) Regulations 2001.

Submissions

- 4 Submissions were received on the bigeye tuna proposals from the following submitters:
- 5 New Zealand Big Game Fishing Council (NZBGFC)
 - **Seafood Industry Council** (SeaFIC)
 - **Sanford Limited** (Sanford)
 - **Te Ohu Kai Moana** (TOKM)
 - **Te Rūnanga o Ōtākou**
 - **Solander**
- 6 The specific submissions on the proposals for bigeye tuna are summarised and addressed under the relevant headings below.

Biological and Fishery Information

Submissions

- 7 The submissions received did not raise any issues concerning the biological or fishery information for bigeye tuna provided in the IPP (refer para 75-89).

MFish response

- 8 MFish confirms its views on the biological and fishery information for bigeye tuna provided in the IPP (refer para 75-89).

Environmental Considerations

Submissions

- 9 No submissions were received on the environmental considerations in relation to sustainability proposals for bigeye tuna outlined in the IPP (refer para 90-93).

MFish response

- 10 MFish confirms its views on the environmental considerations in relation to sustainability proposals for bigeye tuna outlined in the IPP (refer para 90-93).

TAC management strategy

Submissions

- 11 Subject to its reservations regarding the entry of highly migratory species into the QMS, **TOKM** agrees that no attempt should be made to “manage” the fish found seasonally in New Zealand waters under the provisions of s 13 of the Act. To that extent TOKM agrees with the proposal to include all HMS on the Third schedule and set TACs pursuant to s 14.

MFish response

- 12 MFish confirms its view that the purpose of the 1996 Act is better achieved by setting a TAC for bigeye tuna otherwise than in accordance with s 13(2) and that a TAC is set pursuant to s14 of the 1996 Act.

TAC

Submissions

- 13 **TOKM** agrees to the proposal that TAC is based on 50% above highest reported recent commercial landings for the short term subject to the limits being kept under regular review and corrections applied as the fishery develops so that commercial fishing activity and any prospective national allocation by the Western and Central Pacific Fisheries Commission (WCPFC) are not inhibited or interfered with.

- 14 **Solander** assume that the TAC suggested by MFish has a sufficient threshold to ensure that there is no scaling back of PCH for this species. Solander submit that any scaling back to accommodate allocation to Maori and other allowances would be unfair given the arbitrary nature of the catch limits. On the basis that its assumption is correct Solander supports MFish's recommendation on the TAC.
- 15 **SeaFIC** place a reservation on its support of the proposed TACs for tuna species. SeaFICs support of the recommended TACs is conditional on the capacity of the TAC to satisfy people's PCH after accommodating all the requisite allowances and provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.
- 16 SeaFIC supports the MFish preferred option, which is a TAC of 725 tonnes
- 17 **New Zealand Big Game Fishing Council (NZBGFC)** opposes any increase in tuna landings and submits that increased TAC/TACCs should be dealt with using the Adaptive Management Programme in order to make provision for data collection, other sectors and environmental impacts. The NZBGFC submission on yellowfin tuna appears to have a more general application in that it is concerned that setting an excessive TACC for any tuna species will mean that issues of spatial conflict with recreational fishers can be sidelined until further expansion of the commercial fishery is planned.

MFish response

- 18 The MFish initial position was that the TAC for bigeye tuna be based on current utilisation and allowances. An initial preference for a TAC of 725 tonnes was proposed (based on a TACC of 699 tonnes and allowances of 26 tonnes). The TACC of 699 tonnes was based on a 50% increase in the best annual catch of the fishery in recent years (466 tonnes).
- 19 Industry has generally developed the perception that no reduction in provisional catch history would occur on entry of tuna species into the QMS. This perception may be, in part, based on MFish advice to the Minister of Fisheries regarding the choice of catch history years. In this advice MFish used a figure of 1.5 times the best recent years catch as a reference point with which to model the impacts on current fishers (measured in terms of the likely reduction in provisional catch history) associated with the choice of years. The analysis was intended as a relative or comparative exercise with which to assess the impacts of the choices for setting catch history years, however, industry have incorrectly inferred from this analysis that no change in provisional catch history would occur with the setting of a TACC.
- 20 The Solander assumption regarding no scaling back of provisional catch history is not correct in the case of bigeye tuna. Proposals for a TAC/TACC for bigeye tuna were developed independently from consideration of provisional catch history for this species.
- 21 A TAC based on the sum of provisional catch history for bigeye tuna and allowances would be 738 tonnes. In this case the TACC would be an increase of 52.8% over the best year of catch in the fishery to date. The preferred TAC/TACC proposal (Option Two) for bigeye tuna would see a 1.8% reduction (10.6 tonnes) in

provisional catch history to fit within the TACC having allowed for the allocation of 20% of the TACC to Maori.

- 22 While MFish notes the Solander view that any reduction based on arbitrary catch limits would be unfair, MFish does not consider that this level of reduction is significant. However, if you disagree an alternative option is available to you if you wish to accept the Solander and SeaFIC position that no reduction in provisional catch history should result from the setting of a TAC.
- 23 MFish notes that a TAC of 740 tonnes should accommodate both the allocation of 20% of the TACC to Maori and the allocation of provisional catch history without reduction. MFish considers that a TAC at this level is unlikely to create sustainability concerns for the stock as a whole because the New Zealand share of the Pacific wide catch is small. An option for a TAC at this level is therefore provided for your consideration.
- 24 In response to the NZBGFC submission MFish notes that proposal for a TAC and TACC beyond the level of past landings is based on a number of factors. These include the fact that the distribution of bigeye tuna is likely to be Pacific wide and the fact that this species is only seasonally present in New Zealand fisheries waters. MFish considers that the potential for bigeye catch in New Zealand fisheries waters has not been fully explored because of competitive effects in the tuna longline fishery. Further, there is no known conflict with recreational or Maori non-commercial fishing for this species.
- 25 A further factor is the relatively little fishing by domestic interests within the waters of the Kermadec Fishery Management Area. This area has historically supported bigeye tuna catches by foreign licensed fleets. There is a national interest in developing the fisheries for highly migratory species within New Zealand fisheries waters prior to the imposition of any international management controls to be implemented by way of the Western and Central Pacific Fisheries Commission once formed. To this extent MFish does not consider that bigeye tuna fits the characteristics for an Adaptive Management Program at this stage of its development.
- 26 NZBGFC is not correct in saying that matters of spatial allocation can only be addressed in the context of an Adaptive Management Programme. While these are not matters that can be addressed in the setting of sustainability measures for a stock, the dispute procedures of the 1996 Act are available at any stage if recreational fishers consider that their fishing interests are adversely affected by commercial fishing.
- 27 The approved dispute procedure is intended to provide a process for stakeholders to resolve disputes without recourse to regulation. If a dispute remains unresolved the Minister of Fisheries can be asked to resolve that dispute. An important element of the dispute procedure is that if one party to the dispute decides not to participate in the process the Minister of Fisheries can still be asked to make a determination.
- 28 Once bigeye is introduced into the QMS MFish expects that there will be some rationalisation and consolidation in the fishery. The commercial stakeholders (quota owners) will be more readily identifiable and MFish anticipates that the development of stakeholder management arrangements will be facilitated. This will in turn

improve the prospects of stakeholder agreed resolution to any concerns regarding spatial conflict that may occur in the fishery.

- 29 MFish confirms its view that, of the TAC options presented in the IPP, the higher option (option two of 725 tonnes) is preferred. This option will result in a small reduction to individual fishers provisional catch history when this is converted to quota and there will be an economic impact associated with a TAC at this level. An alternative TAC option of 740 tonnes is presented for your consideration which, based on provisional figures, should provide for 20% of the TACC to Maori with no scaling back of provisional catch history when this is converted to quota.

Proposed Allowances and TACC

Submissions

- 30 **Te Runanga o Otakou (Inc)** submit that pursuant to the settlement Act the Minister of Fisheries is required to develop policies to help recognise the use and management practises of takatā whenua in the exercise of customary non-commercial fishing rights. Te Runanga o Otakou (Inc) propose that a minimum non-commercial allowance of 25% of the TAC is set for all species proposed for introduction into the QMS of which 80% should be made available for customary Maori fishing. Te Runanga o Otakou (Inc) submit that a customary allocation does not require a harvest to be deemed to be utilised traditionally.
- 31 No other submissions were received on non –commercial allowances, other sources of fishing mortality. Submissions on the TACC and its relation to provisional catch history are addressed in the preceding TAC section.

MFish response

- 32 MFish notes the view of Te Runanga o Otakou (Inc) but concludes that a standard approach to setting allowances in the manner suggested is not appropriate. Rather a case-by-case consideration is indicated.
- 33 In the case of bigeye tuna there are no estimates of non-commercial catch of this species and small nominal allowances have been proposed. The setting of non-commercial allowances at the level proposed by Te Runanga o Otakou (Inc) for bigeye tuna (around 200 tonnes) is unrealistic given the distribution of the species in New Zealand fisheries waters; that is, a non-commercial catch at this level is unlikely to be realised. The submission of Te Runanga o Otakou (Inc) is addressed in further detail in the generic section of this advice.
- 34 MFish confirms its views on allowances and TACC as outlined in the IPP. That is an allowance of 4 tonnes for customary fishing, 8 tonnes for recreational fishing and for other sources of fishing mortality based on 2% of the TACC. In this case, two options for TACC are presented. The allowance recommended for other sources of fishing related mortality is the same for both, that is 14 tonnes.

Other management measures

Submissions

- 35 **TOKM** agrees with the proposal to include all highly migratory species on the Third Schedule
- 36 **TOKM** propose that bigeye tuna is added to the Sixth Schedule on the basis that the benefits attributed to the inclusion of southern bluefin tuna on the Sixth Schedule should apply to other highly migratory species. TOKM recommend the inclusion of all highly migratory species on the Sixth Schedule subject to the conditions that:
- The animal is alive;
 - The animal is returned to the water as soon as possible; and
 - The animal is likely to survive after release.
- 37 **SeaFIC** submit that the provisions of the Sixth Schedule should apply to all highly migratory species.
- 38 No other submissions were received.

MFish response

- 39 MFish confirms its view that
- a) Bigeye tuna is added to the Third Schedule (by Order in Council) as species for which it is not possible to estimate MSY. A recommendation to this effect is contained in separate advice; and
 - b) Consequential amendments to the Fisheries (Reporting) Regulations 1999 are made to reflect the decision to introduce bigeye tuna into the QMS.
- 40 MFish did not propose that bigeye tuna is added to the sixth schedule of the Act (this schedule provides for the release of quota species to the sea subject to specified conditions).
- 41 As a general rule MFish considers that quota species once caught should be retained unless there are good reasons for an exception to this rule. The use of the Sixth Schedule in the case of some highly migratory species has a specific rationale and is predicated on the fact that any fish released under the provisions of the Sixth Schedule is likely to survive (refer TOKM submission).
- 42 MFish has proposed the addition of only one tuna species, southern bluefin tuna, to the Sixth Schedule. This proposal is specifically intended as a mechanism to assist fishers to remain within the national allocation determined for this species. MFish notes that the use of the Sixth Schedule for southern bluefin tuna has been opposed by some industry in submission as they consider that this provision will be abused potentially leading to higher mortality on the stock.
- 43 MFish does not consider that there are good reasons to provide for the release of bigeye tuna using provisions of the Sixth Schedule and without such reasons the

general rule requiring the landing of all quota catch should prevail. The TACC proposed will ensure that sufficient ACE is available to cover expected catches in the short term. The level of deemed value proposed is not punitive and strikes a balance between the objectives of ensuring that fishers do not discard catch and encouraging fishers not to fish beyond the level of available ACE.

Deemed value and overfishing thresholds

Submissions

- 44 **TOKM** agrees with the proposals for bigeye but notes that its agreement is only on a short term basis and is conditional on its comments regarding regular reviews and revisions of the TAC/TACC.
- 45 **SeaFIC** supports the annual deemed value at 75% port price (\$11.54) and the interim deemed value of 50% of the annual.

MFish response

- 46 MFish proposed a deemed value of \$11.54 (based on 75% of the port price for bigeye tuna under the category of 'all other fishstocks'), that differential deemed values apply and that no overfishing threshold applies.
- 47 The MFish proposal was based on a port price for bigeye tuna assessed for the 2003–2004 year (\$15.38). New port price information is now available for the 2004–05 year and there is a change in the port price for bigeye tuna, which is now \$20.18 per kg.
- 48 MFish confirms its view that a deemed value for bigeye tuna should be based on 75% of the port price under the category of 'all other fishstocks'. MFish considers that new port price information should be used and recommends a deemed value of \$15.14 per kg. MFish also recommends that differential deemed values apply but no overfishing threshold.

Legal Obligations

- 29 The statutory considerations that must be taken into account when setting a TAC and allowances for bigeye tuna were identified in the IPP (refer to para 63-73). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Recommendations

- 30 MFish recommends that you:
- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for bigeye tuna otherwise than in accordance with s13(2) of the 1996 Act.
 - b) **Agree** to set a TAC for bigeye tuna pursuant to s 14 of the 1996 Act.
 - c) **Agree** to set a TAC for bigeye tuna of 725 tonnes and within this set:

- i) A customary allowance of 4 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance of 14 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 699 tonnes.
- d) **Note** that there will be a small economic impact associated with this option.

OR

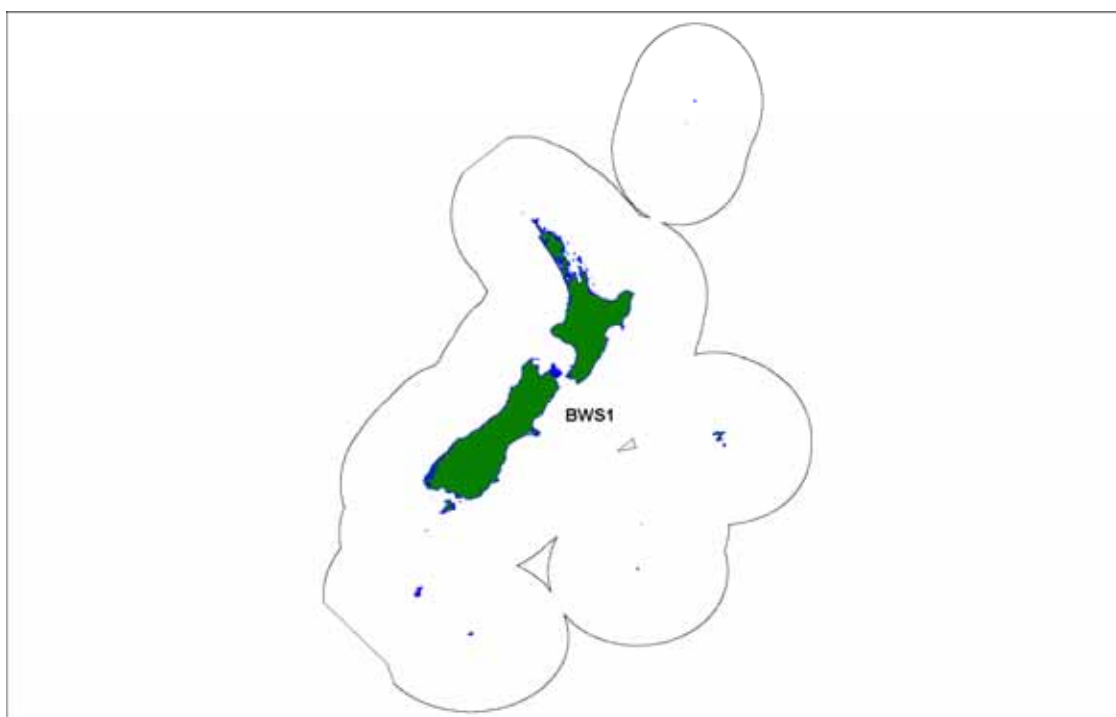
- e) **Agree** to set a TAC for bigeye tuna of 740 tonnes and within this set:
- i) A customary allowance of 4 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance of 14 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 714 tonnes.
- f) **Agree** to set a deemed value for bigeye tuna of \$15.14 per kg.
- g) **Agree** that differential deemed values apply.
- h) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

BLUE SHARK (BWS) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Blue shark (*Prionace glauca*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Area (QMA) for blue shark is outlined in Figure 1. The fishing year for blue shark will be from 1 October through to 30 September in the following year, and the Total Allowable Commercial Catch (TACC) and Annual Catch Entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: Quota Management Areas for blue shark



Key Issues to be Considered

- 2 Blue shark is one of the most widespread shark species in the world. In New Zealand, blue shark is likely to belong to a single, large, wide-ranging stock probably comprising the entire South Pacific, and possibly including the North Pacific and Indian Oceans. The degree to which populations of blue shark are resident in New Zealand fisheries waters is unknown.
- 3 Internationally, there is concern about increasing catches of sharks and the potential adverse effects on shark populations. Sharks, in general, are characterised by slow growth, late onset of maturity, and low fecundity. However, blue shark is considered to be relatively more productive than other shark species. At present, there are no specific international obligations to impose catch limits for blue shark.

- 4 Blue shark is a bycatch in tuna longline fisheries for southern bluefin, bigeye and albacore, and is also taken by bottom longliners and midwater trawlers. There are no target fisheries for blue shark in New Zealand, but the choice of fishing gear can influence the retention of sharks once caught through the use of steel traces.
- 5 The flesh of blue shark ammoniates rapidly after death, making it inedible if not properly handled. Consequently, most blue shark is finned and the carcasses discarded.
- 6 There has been significant under-reporting of blue shark catches, from small sharks being caught and discarded, and from sharks being finned.
- 7 Industry is concerned about having to land large dangerous sharks onboard vessels when their preference is to release them.
- 8 In New Zealand, blue shark recruits to commercial fisheries during their first or second years, with much of the commercial catch comprising juveniles of this species.
- 9 MSY cannot be estimated for blue shark, as the fish found in New Zealand are only part of a wide-ranging stock.
- 10 There have been no assessments of the potential yield of blue shark in New Zealand and information is not available to undertake such assessment.
- 11 Setting low TACCs for blue shark is likely to either constrain the target tuna fisheries or result in widespread discarding of blue shark.
- 12 The conversion factors for blue shark appear to be incorrect.

List of Management Options

- 13 It is proposed to include blue shark on the Third Schedule to the 1996 Act, as a species for which it is not possible to estimate MSY, because of the biological characteristics of the species.
- 14 It is proposed to set a TAC pursuant to s 14 of the 1996 Act as MFish considers that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2).
- 15 MFish proposes the following catch limits for blue shark (refer Table 1).

Table 1: Proposed TAC, TACC, and allowances for blue shark (tonnes)

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
BWS 1	2 080	10	20	190	1 860

- 16 MFish also proposes to:
 - a) Include blue shark on the Sixth Schedule to the 1996 Act, so that fish may be returned to the sea in accordance with stated requirements;

- b) Review the conversion factors for blue shark;
- c) Amend the reporting regulations to ensure that the appropriate fishstock code for blue shark is used under the QMS; and
- d) Set a deemed value, but no overfishing threshold, for blue shark.

TACs

TAC management strategy

- 17 Section 14 of the 1996 Act provides an exception to setting a TAC based on an assessment of MSY where the Minister is satisfied that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with the s 13(2). It is not possible to estimate MSY for the part of the blue shark stock that is found within New Zealand fisheries waters.
- 18 It is therefore proposed that TACs for blue shark are set pursuant to s 14 of the 1996 Act. While any TAC must be set in a way that ensures use of the stock is sustainable there is no requirement to take into account or be guided by the need to manage in accordance with MSY. A TAC set under s 14 of the Act must be set in a way that better achieves the purpose of the 1996 Act than would a TAC set under s 13. MFish believes that a TAC set under the provisions of s 14 of the 1996 Act can better provide for utilisation (developing fisheries to enable people to provide for their social, economic and cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters while ensuring sustainability.
- 19 Further, s 14 provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

Rationale for Proposed TACs

- 20 There have been no assessments of the potential yield of blue shark in New Zealand and no information is available to undertake such assessment. The information available to assess the sustainability of the blue shark fishery is limited to information on the biological and reproductive characteristics of blue shark and catch information within New Zealand fisheries waters.
- 21 Blue shark is a highly migratory species of oceanic habit whose stock status is not known. Blue shark is one of the most widespread shark species in the world and, in New Zealand, is likely to belong to a single, large, wide-ranging stock probably comprising the entire South Pacific, and possibly even including the North Pacific and Indian Oceans. The degree to which populations of blue shark are resident within New Zealand fisheries waters is unknown. Consequently it is not possible to use target stock levels based on MSY for blue shark.
- 22 In the absence of estimates of sustainable catch a TAC based on estimates of current utilisation is proposed. This is problematic because of the reporting problems associated with the fishery. MFish has used the best available information on which to base estimates of commercial catch, and has applied a correction factor to account for known potential errors. The average commercial reported landings over the last three fishing years adjusted upwards by 50% have been used to estimate current

commercial utilisation (1 860 tonnes). Non-commercial use and other sources of fishing mortality (220 tonnes combined) are assessed in order to determine a total level of current utilisation 2 080 tonnes). MFish considers that a TAC at this level is likely to be sustainable.

- 23 A further consideration has been whether there is further development potential in the fishery for blue shark. Current policy guidelines suggest that such potential should be assessed against the following factors:
- 24 **Sustainability of the stock**, within the effort put into the target fisheries of which blue shark is a bycatch, in comparison to the total international effort put into those fisheries, the New Zealand take of shark is unlikely to be significant. Within New Zealand, blue shark is predominantly taken as bycatch in the tuna longline fisheries, but also associated with bottom longlining and midwater trawling. There are no target fisheries for blue shark in New Zealand, but the choice of fishing gear can influence the retention of sharks once caught through the use of steel traces.
- 25 Compared with a wide range of shark species, the productivity of blue shark is moderate because of its relatively fast growth and high (for sharks) fecundity. However, NIWA notes that observer information suggests that the majority of blue shark caught in tuna longline catches around the North Island are dominated by immature sharks of both sexes and mature males.
- 26 Commercial catch reporting of blue shark is considered inconsistent at best. Reporting of greenweight landings when only part of the shark is landed rely on the application of conversion factors, which may be inaccurate by as much as 60%. Consequently, little can be inferred from landing data, except that commercial catch and landings data in New Zealand probably greatly underestimate actual catches of blue shark, mainly through non-reporting of discarded sharks and reporting of processed weight by tuna longline vessels which often keep only the fins.
- 27 The large proportion of immature blue shark in the reported landings, particularly in the tuna longline fisheries, raises some concern about the long term sustainability of the South Pacific stock. MFish considers some caution needs to be taken in any adjustment of the underestimation of the actual landings of blue shark not to exacerbate sustainability concerns by any escalation in the catching of immature blue shark.
- 28 **Biology of the stock and potential for local depletion**, for blue shark the risk is considered to be low to moderate. It is unlikely that New Zealand catches of blue shark influence the global sustainability for blue shark significantly. But the risk is compounded by the observer information which suggests that a large proportion of the blue shark caught in tuna longline catches around the North Island is dominated by immature sharks of both sexes.
- 29 There is also anecdotal information from recreational fishers that there are fewer blue shark available to them.
- 30 **Impacts of fishing on the aquatic environment including bycatch**, for blue shark is a factor of moderate risk. Blue shark is taken in conjunction with other large tuna species including southern bluefin tuna and any increase in catch creates some risk

that southern bluefin tuna may be caught over and above the catch limit set for this species. There is also an unquantified risk to the viability of associated and dependent species, which is method, rather than species dependent.

- 31 **Socio economic and cultural issues**, with blue shark there are clear benefits to the fishery if an expansion in catch can be realised and sustained. The fishery is shared with the recreational sector and there is already information to suggest that fishing is having an impact on their interests.
- 32 **Anecdotal information on abundance and size of likely habitat in the management area**, for blue shark the extent of the habitat within New Zealand fisheries waters is unknown. Anecdotal information suggests that there is some vulnerability of this shark species to overfishing.
- 33 On balance the risks associated with an increase in catch of blue shark are considered to be moderate. MFish therefore proposes to set a TAC for blue shark based on a best estimate of current utilisation. MFish proposes a TAC for BWS 1 of 2 080 tonnes.

Allocation of TAC

Recreational Allowance

- 34 As indicated in Annex Two, the National Marine Recreational Fishing surveys provide no quantitative estimates of recreational harvest of blue shark. Blue shark is not highly prized as a game fish and the recreational catch probably consists mainly of sharks caught incidentally while targeting mako sharks or tunas. However, there is an increasing interest in tag and release of blue shark that may result in some increased catch and death of sharks.
- 35 MFish proposes that the Minister set an allowance for recreational fishers, as outlined in the Statutory Obligations and Policy Guidelines section. There are no estimates of recreational catch but, based on MFish's general understanding of the likely level of fishing activity of the recreational blue shark fishery, MFish proposes a nominal 20 tonne recreational allowance for BWS 1.
- 36 When considering the allowance for recreational interests in the blue shark fishstock, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made under s 311 of the 1996 Act. No such regulations have been made, and accordingly no adjustment to the proposed allowance needs to be considered on this basis.

Customary Māori Allowance

- 37 The levels of customary Māori harvest of blue shark are not known, however, shark in general are known to be taken by customary fishers. MFish considers that customary fishers are likely to make less use of blue shark resources than recreational fishers.
- 38 Accordingly, MFish proposes to set the customary allowance at one-half of that provided to recreational fishing interests based on the criteria outlined in the Statutory Obligations and Policy Guidelines section. Thus, MFish proposes a 10 tonne customary Māori allowance for BWS 1.

- 39 In considering the allowance for Māori customary non-commercial interests, the Minister is required to take into account any mātaihai reserve or s 186 closure. MFish does not consider that the allowance proposed will detract from the intent of any mātaihai reserve or s 186 closure presently in place, nor will the allowance be likely to be insufficient in terms of customary use of blue sharks in these areas.

Allowance for other sources of mortality

- 40 There is no information on the current level of illegal catch of blue shark, although it may occur in order to obtain shark fins. It is suggested that no allowance is made to cover illegal catch at this time.
- 41 In the commercial fishery there has been considerable discarding of small sharks, and of large dangerous sharks. There is little information on the amount of unreported discarded catch for blue shark. About two-thirds of the blue shark catch of tuna longliners is finned and the carcasses discarded¹. This suggests that one-third of the blue shark catch is discarded whole, but what proportion of these discards are reported is not known. A proportion of these sharks will subsequently die from injuries and trauma sustained during capture and release. MFish proposes that blue shark be added to the Sixth Schedule to allow their return to the water (refer para 54), with the requirement that they must be likely to survive. Even so MFish anticipates that a small proportion of these released sharks will die.
- 42 Recreational fishers in New Zealand have an active program of tagging and release of blue shark (refer Annex Two). It is anticipated that a small proportion of these released sharks will subsequently die from injuries and trauma sustained during capture and release.
- 43 MFish has no information to quantify the survival of the recreational tagged and released fish, nor the discarded unreported catch and its survival. In the absence of better information MFish considers it prudent at this stage that the allowance for all other sources of fishing-related mortality be set at 10% of the proposed TACC and the recreational allowance.
- 44 Based on this rationale, MFish proposes a 190 tonne allowance for other sources of fishing-related mortality for blue shark.

TACC

- 45 Over the past five fishing years, the nominal total weights of blue shark reported by fishers on catch effort landing returns (CELRs) (landed), catch landing returns (CLRs) and tuna longlining catch effort returns (TLCERs) (not adjusted to whole weight) ranged from 670 tonnes to 1 445 tonnes annually. Licensed fish receiver returns indicate between 537 and 1 415 tonnes were processed for the same period. In recent years, landed weight of blue shark has increased markedly, however New Zealand's contribution to the catch of blue sharks in the Pacific region is around only 1% of the total.

¹ Francis, M.P., Griggs, L.H., Baird, S.J. 2001: Fish bycatch in the tuna longline fishery. Final Research Report for Ministry of Fisheries research Project ENV2000/03 Objective 1 67 p.

- 46 MFish notes that historically, reported landings of blue shark almost certainly underestimate catches due to unrecorded discards, especially of unwanted small sharks, and the application of incorrect conversion factors. There are substantial differences between the reported landings on fishing returns and those reported on LFRRs. Part of the problem is that data requirements are inconsistent between fishing return forms. CELRs and CLRs are in whole weight, which is calculated by applying an appropriate conversion factor to the recorded processed weight but TLCER data are reported as processed weight. No processed state is required on these forms, so a conversion factor cannot be applied. Blue shark is usually finned on tuna longline vessels, so the processed weight will be a small fraction of the whole weight. For these reasons the reported landings will underestimate actual catches.
- 47 The increase in reported landings over recent years is probably due to a combination of better reporting and/or increased effort in the tuna long-line fishery resulting in higher blue shark bycatch. The increase in reported landing needs to be viewed within the context of a significant increase in effort.
- 48 MFish notes that even for recent years the reported catches of blue shark are likely to be under-estimates because of non-reporting of catches, incorrect conversion factors, and reporting of blue shark catches against SHA/OSD codes.
- 49 MFish notes that there has been an increasing proportion of the blue shark catch being reported taken as shark fins in recent years, following the world-wide development of the shark-fin trade. MFish notes that blue shark, along with many other shark species, have a generic conversion factor of 30:1 applied to convert from fins to greenweight. MFish is aware that this conversion factor may be inappropriate for blue shark. Australian data for blue shark suggests that a more appropriate conversion factor is 48:1. MFish proposes that a review be undertaken of the conversion factors for blue shark during 2004. The impact of any change in conversion factor is included in current estimates of commercial utilisation by the application of a correction factor to reported landings.
- 50 MFish is also aware that many commercial fishers have reported blue shark catches using generic codes including *other sharks and dogs* (OSD) or *sharks* (SHA) rather than the BWS code for blue shark. MFish commissioned NIWA to investigate what species of shark are likely to have been reported under the OSD or SHA codes. NIWA used data from the research and observer databases to determine the relative proportion of each shark species by FMA, method/target species, and depth to provide an allocation of OSD or SHA catches to seven shark species. The report² concluded that for the tuna longline fishery, in particular, the majority of the OSD/SHA catches were blue shark.
- 51 Use of the Sixth Schedule of the 1996 Act is an option that would allow the sustainability of blue shark to be addressed, while ensuring that bycatch does not constrain target fisheries. Species included on the Sixth Schedule of the Act may be returned to the water subject to conditions that ensure that they are likely to survive release. This option does address the concern raised in submissions regarding the

² Beentjes, M.P. 2003. New species into the QMS – OSD and SHA codes. Final Research Report for Ministry of Fisheries Research Project MOF2003/03C. National Institute of Water and Atmospheric Research, Dunedin. 43 p.

danger of handling large sharks when QMS rules require all fish subject to quota be landed. This danger would be manageable if there were provision for the release of live sharks. The economic return from catching smaller sharks is also not as good with reduced meat recovery and lower prices for fins. Inclusion within the Sixth Schedule also enables the marginally economic smaller sharks to not have to be landed.

- 52 In recognition of the fact that reporting in recent years has improved, MFish proposes that TACs are based largely on average reported landings over the last three completed fishing years (1990-00 to 2001-02). As a consequence of the under-reporting of blue shark catches, but taking account of sustainability issues associated with the predominant harvest of immature sharks, MFish proposes to make a upward 50% adjustment to the average reported landings over the last three completed fishing years to provide a proposed TACC for blue shark. Thus, MFish proposes a TACC of 1 860 tonnes for BWS 1.
- 53 Setting of the proposed TACC using this adjustment should maintain current catch levels. Setting of the proposed TACC with this level of adjustment for under-reporting is likely to result in neither constraining the target tuna fisheries or in widespread discarding of blue shark.

Other Management Measures

- 54 Specific measures are proposed in respect of:
- Providing for inclusion of blue shark on the Third Schedule (by Order in Council) as a species for which it is not possible to estimate MSY;
 - Allowing the return of live blue shark to the water;
 - Reviewing the conversion factors for blue shark;
 - Making consequential amendment to the fisheries reporting regulations; and
 - Setting a deemed value for blue shark.

Inclusion of blue shark on the Third Schedule

- 55 MFish proposes that blue shark be added to the Third Schedule of the 1996 Act.
- 56 Blue shark is a highly migratory species and NIWA reports that blue shark caught in New Zealand waters are part of a stock that includes the entire South Pacific, and may also include the North Pacific and Indian Oceans. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. One of the criteria for inclusion of a stock on the Third Schedule is therefore satisfied.
- 57 Section 14 of the Act requires that species managed under s 14 be listed on the Third Schedule of the 1996 Act by Order in Council. Section 14 of the 1996 Act provides for the setting of an alternative TAC if the purpose of the Act is better achieved than by setting a TAC pursuant to s 13(2)

Return of blue shark to the water

- 58 MFish proposes that blue shark be added to the Sixth Schedule of the 1996 Act to allow their return to the water, with stated requirements that they must be likely to survive and must be returned to the waters from which they were taken as soon as practicable.
- 59 Adding blue shark to the Sixth Schedule will provide fishers that catch blue shark as a bycatch, with the flexibility to legally return these fish to the sea. MFish considers this an advantage as large blue shark may endanger fishers, while smaller sharks are of no or little value, but their take would impact upon the sustainability of the species. Details of this proposal are set out in Annex One at the end of this section.

Review the conversion factors for blue shark

- 60 As outlined in the section explaining the rationale for TACC setting, MFish considers that the current conversion factors applying to blue shark may not be correct. Therefore, MFish proposes that a review be undertaken of the conversion factors for blue shark.

Consequential amendment to regulations

- 61 As a consequence of the introduction of blue shark into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this paper.

Deemed values and overfishing thresholds

- 62 A separate section in this document sets out generic information on the setting of interim and annual deemed values and overfishing thresholds proposed for blue shark.
- 63 MFish considers that with low information and poor reporting for blue shark it is appropriate to encourage the reporting of all catches of blue shark by setting a low deemed value for blue shark. Accordingly it is proposed to include blue shark within the low knowledge fishstock category and use the 60% of port price level. There are no known sustainability concerns for blue shark that would necessitate a deterrent deemed value.
- 64 A port price for blue shark has not been determined Blue shark is a low value species and therefore MFish proposes to use a nominal port price of \$0.25 per kg. An annual deemed value for blue shark of \$0.15 per kg is proposed. MFish does not propose to set differential deemed values or overfishing thresholds for blue shark unless monitoring of catch against the TACC suggest that this is required in the future.
- 65 MFish proposes that a carry forward of 10% of ACE be allowed for blue shark on the basis that this will not unreasonably increase sustainability risk to the stock, and will allow flexibility for fishers to manage their fishing operations

Statutory Considerations

66 In forming the management options the following statutory considerations have been taken into account:

- a) The management options seek to ensure sustainability of the stock as required under s 8 by setting a TAC and other appropriate measures. Enhanced reporting will significantly improve understanding of the fishery and use of the Sixth Schedule will reduce unnecessary waste within the fishery. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers.
- b) While blue shark is an inevitable bycatch of the tuna longline fishery and setting a TACC for blue shark could possibly act to constrain the target tuna fishery, MFish considers that this prospect can be mitigated by the inclusion of blue shark into the Sixth Schedule whereby blue shark can be returned to the sea.
- c) Blue shark is an inevitable bycatch of a number of target fisheries, principally the tuna longline fishery, and, with the exception of fins, there is little market opportunity for the species with some fishers discarding their catch. With a TACC set at the average of the last three years of commercial catch, and an increment of 50% to provide for likely under-reporting, MFish considers that there will not be a significant impact on social, economic and cultural factors.
- d) There is little known about the natural variability of blue shark.
- e) As mentioned, blue shark is a bycatch of fisheries that target their prey species such as other sharks and pelagic fishes and to a lesser extent squid, or, a bycatch of fisheries that target other species that predate on the same species, such as tuna. There is no evidence that these interactions are of significant magnitude to impact on associated and dependent species, or on biological diversity. No other information has been considered about any effects of fishing for blue shark on any stock or on the aquatic environment.
- f) Being a pelagic oceanic species and an inevitable bycatch fishery, it is considered unlikely any potential impact to habitats of particular significance to fisheries management would be attributed to the bycatch of blue shark.
- g) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options for blue shark.
- h) For blue shark there is a bag limit in place for recreational fishers in FMAs 3, 5 and 6. MFish does not anticipate any change in these limits at this time.
- i) No fisheries plan exists or are proposed for BWS 1.
- j) Blue shark is taken solely as a bycatch. Relevant conservation services or fisheries services relate to the target fisheries. No decision has been made not to require a service in this fishery.
- k) There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or

any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for BWS 1.

- l) Similarly, before setting any sustainability measure relevant to the Hauraki Gulf, the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000. This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. MFish considers that setting of sustainability measure for blue shark will better meet the purpose of the Act, and ensure that the range of values associated with use of the blue shark resource are enhanced for the people and communities in the area.
- m) The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaītai reserves exist within BWS 1 the values of the mātaītai will not be compromised as blue shark are an oceanic stock. No area has been closed or fishing method restricted for customary fishing purposes in BWS 1 that would affect the fishery. No restrictions have been placed on fishing in any area within the BWS 1 for recreational interests.

Preliminary Recommendations

67 MFish recommends that the Minister:

- a) **Agrees** that the purpose of the 1996 Act is better achieved by setting a TAC for blue shark otherwise than in accordance with s 13(2).
- b) **Agrees** to add blue shark to the Third Schedule of the Act and set a TAC for blue shark pursuant to s 14 of the 1996 Act.
- c) **Agrees** to set a TAC of 2 080 tonnes for BWS 1 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 20 tonnes;
 - iii) An allowance for other fishing-related mortality of 190 tonnes; and,
 - iv) A TACC of 1 860 tonnes.
- d) **Agrees** to add blue shark to the Sixth Schedule of the Act.
- e) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.
- f) **Agrees** to set deemed values for the blue shark stock at \$0.15 per kg.
- g) **Notes** that a carry forward of 10% of ACE is proposed for the blue shark stock.
- h) **Notes** that a review is proposed of the conversion factors for blue shark.

ANNEX ONE

Sixth Schedule - return of blue shark to the water

- 75 MFish proposes to provide for the return of blue shark to the sea by adding blue shark to the Sixth Schedule of the 1996 Act, with stated requirements that they are likely to survive, and must be returned to the same waters from which they were taken as soon as practicable.
- 76 Under s 72 of the Fisheries Act 1996, once blue shark are introduced to the QMS, commercial fishers would be obliged to retain blue shark obtained by any fishing method. Blue shark is likely to be robust enough to enable it to be returned to the sea and subsequently survive.
- 77 If blue shark were added to the Sixth Schedule, commercial fishers who took blue shark as an unintentional bycatch would be able to return it to the sea alive, provided they comply with the requirements set out in the Schedule.

Problem definition

- 78 Blue shark is caught as a bycatch and not a target species, which means there is little economic value associated with its take but there is a cost imposed by the requirement to obtain ACE and a risk to the sustainability of the species. Blue shark frequently survive capture depending on the time hooked or the length of tow. Further, smaller shark are of little or no value, while landing and handling larger blue sharks can be very dangerous.

Preliminary consultation

- 79 No preliminary consultation has been undertaken concerning adding blue shark to the Sixth Schedule. The desirability of the option not having to handle large sharks was identified in a submission by Vela Fisheries Ltd on the Consultation Document on "Introduction of New Stocks into the QMS on 1 October 2004" dated 27 June 2003.

Options

Non-Regulatory Measures

- 80 Unless blue shark is added to the Sixth Schedule, it will be illegal to return or release to the sea blue shark that are dangerous or of no economic value because of their size. There is no non-regulatory mechanism for returning fish taken under the QMS to the sea.

Regulatory Measures

- 81 To implement this measure it is necessary to add blue shark to the Sixth Schedule of the 1996 Act.

Costs and benefits of the proposal

- 82 Adding blue shark to the Sixth Schedule will provide fishers that catch blue shark as a bycatch with the flexibility to legally return these fish to the sea (provided they are immediately returned alive). MFish considers this an advantage as large blue shark may endanger fishers, while smaller sharks are of no or little value, but their take would impact upon the sustainability of the species. Allowing blue shark to be returned to the sea is the least cost option for fishers and should encourage fishers to adopt fishing practices that assist the survival of blue shark, especially since they will not be penalised by deemed value payments.
- 83 Because of their limited value, discarding blue shark caught as a bycatch is a reasonably common practice. Allowing blue shark to be returned to the sea will avoid additional compliance costs that would be needed to ensure that blue shark were not returned to the sea illegally.

Administrative implications

- 84 There are no significant administrative implications.

ANNEX TWO

Species Information

Species Biology

- 85 Blue shark is one of the most widespread shark species in the world and, in New Zealand, is likely to belong to a single, large, wide-ranging stock probably comprising the entire South Pacific, and possibly even including the North Pacific and Indian Oceans. Published estimates suggest that about 140 000 tonnes of blue shark were caught by high-seas fleets in the entire Pacific Ocean in 1994.
- 86 The degree to which populations of blue shark are resident within New Zealand fisheries waters is unknown. Blue shark populations are strongly segregated by size and sex, and undergo seasonal migrations. In the North Pacific, a nursery ground occurs north of the Sub-arctic Boundary, between 40 and 50°N. In both the North and South Pacific, mean shark size declines towards the poles. Blue shark caught on tuna longlines in New Zealand are mostly juveniles.
- 87 In the Pacific Ocean off California, tagged blue sharks have moved up to 6 147 km, and off Australia the greatest recorded movement was 5 504 km. Blue sharks have been tagged in New Zealand since 1975. Up to June 2000, 2 947 blue sharks had been tagged but only 48 had been recaptured. Most of the tagged sharks were small to medium with estimated lengths of 120–220 cm total length (TL), and weights of 5–50 kg. They were mainly tagged off east Northland, Wairarapa, and Dunedin. Long distance movements out of the New Zealand EEZ included seven travelling to Australia, two to Fiji, one each to Tonga, Philippines, Marquesas, and Tahiti, and one to Chile (9 300 km).
- 88 The reproductive biology of blue shark has been well studied overseas. Determination of maturity status is complicated by the existence of pre-mature mating and sperm storage in subadult females, and the lack of rapid maturation of claspers in males. In addition to these difficulties, maturation appears to occur over a wide size range. Females mature over the range 182–275 cm TL and males over the range 173–280 cm TL. In both sexes, 50% maturity appears to be reached around 210–230 cm TL. Pacific blue shark may mature at lengths slightly shorter than Atlantic sharks. Length at birth is in the range 35–55 cm TL, with most young probably being born at 45–50 cm TL. Parturition in both hemispheres occurs in spring or summer. The length of the gestation period is uncertain but is thought to be 9–12 months. Females probably ovulate a new set of ovarian eggs soon after parturition, so the reproductive cycle appears to be annual with no extended resting period. Litter size is four to 135 embryos, with averages ranging between 26 and 56.
- 89 Overseas studies show that blue sharks grow fast initially, reaching about 200 cm TL within five years of birth. Age at maturity is about four to six years for males and five to seven years for females. The oldest blue shark aged was 16 years, and a shark that was 151 cm TL at tagging (predicted age three to four years) was recaptured after 10.7

years at liberty, so longevity of 16–20 years seems reasonable. The longest reliably measured blue shark was 383 cm TL, but it is likely that they exceed 4 m.

- 90 In New Zealand, blue shark recruits to commercial fisheries during their first or second years, and much of the commercial catch are juvenile fish. New Zealand tuna longline catches around North Island are dominated by immature sharks of both sexes and mature males (70–250 cm fork length (FL)). Mature sharks are rarely caught south of Cook Strait, where most of the catch by tuna longliners consists of immature males and immature and subadult females (60–180 cm FL). Longevity and natural mortality rate are unknown for the population occurring around New Zealand.
- 91 Blue shark is an active pelagic predator of fish and squid. There are few specific data on the feeding of blue shark in New Zealand fisheries waters, but pelagic fish predominate in the diet.

Fisheries Characteristics

Commercial catch

- 92 Blue shark is caught commercially as a bycatch by tuna longliners, bottom longliners, and midwater trawlers. There are no target fisheries for blue shark in New Zealand, but the choice of fishing gear can influence the retention of sharks once caught through the use of steel traces.
- 93 Landings of blue shark reported on CELR (landed), CLR, and TLCER forms are shown in Table 2. Data format is inconsistent across forms: CELR and CLR data are (in theory) whole weight, which is calculated by applying an appropriate conversion factor to the processed weight. But TLCER data are reported as processed weight, and because no processed state is reported on these forms, a conversion factor cannot be applied. Blue shark is usually finned on tuna longline vessels, so the processed weight will be a small fraction of whole weight. Thus TLCER data likely represent a gross under-estimate of whole weight. This is supported by estimates of the catch of blue shark aboard tuna longliners, based on scaled up scientific observer records, that are considerably higher than TLCER totals (compare columns four and seven in Table 2).
- 94 The nominal total weights of blue shark reported by fishers on CELRs (landed), CLRs and TLCERs (not adjusted to whole weight) were 670–1 445 tonnes during the last five fishing years (Table 2, column five). Processors reported 537–1 415 tonnes on LFRRs during the same period. There has been a major increase in the weight of blue shark landed in recent years, but landings data almost certainly underestimate catches because of unrecorded discards.

Table 2: Commercial landings and discards (tonnes) of blue sharks reported by fishers (CELRs, CLRs, and TLCERs) and processors (LFRRs) by fishing year. Also shown are the estimated quantities of blue sharks caught by tuna longliners, based on scaled up scientific observer records; values in parentheses are for the foreign chartered fleet plus one large domestic vessel only, because of insufficient observer coverage of the domestic fleet (Francis et al. 2001b). – no data available.

Year	Reported by fishers			Total reported	Processed LFRR	Estimated catch by tuna longliners
	CELR and CLR Landed	Discarded	TLCER processed wt			
1989–90	12	0	–	12	5	–
1990–91	2	0	11	13	3	–
1991–92	18	0	12	31	13	–
1992–93	39	0	26	65	33	–
1993–94	370	1	33	405	118	–
1994–95	251	2	52	305	140	–
1995–96	145	6	49	201	166	–
1996–97	131	31	114	275	303	800
1997–98	518	32	119	670	537	1 369
1998–99	528	48	171	747	525	(373)
1999–00	629	12	165	806	1 031	(275)
2000–01	1 119	48	278	1 445	1 415	–
2001–02	1 019	57	164	1 240	–	–

Catch by region

- 95 Because data reported on TLCERs are not directly comparable with data reported on other forms, the former are treated separately below.

Tuna longline fishery (TLCERs)

- 96 Catches of blue shark reported by scientific observers aboard tuna longliners are concentrated off the west and south-west coast of the South Island, and the north-east coast of the North Island. However, these apparent distributions are biased by the spatial distribution of observer coverage, which has been uneven for the domestic fleet. The latter operates around most of the North Island but observer coverage of it has been largely restricted to the north-east coast of North Island. Blue shark is probably taken by tuna longliners around most of mainland New Zealand. Most blue shark reported on TLCERs were taken from FMAs 1, 2, and 9 (38%, 37%, and 11% of the processed weight respectively over the period 1990–91 to 2001–02). The target species for this fishery are mainly southern bluefin, bigeye, and albacore tuna.

Other fisheries (CELRs, CLRs)

- 97 Small blue sharks caught by tuna longliners are discarded whole, but about two-thirds of the catch is finned, and the carcasses discarded. Most of the blue shark landings reported on CELR (landed) and CLR forms were taken in FMA 1, with significant quantities also coming from FMAs 2, 5, and 7 (Table 3).

Table 3: Percentage of blue shark landings taken by FMA (CELR landed and CLR). 0, less than 0.5%; blank, no catch reported.

Year	FMA 1	FMA 2	FMA 3	FMA 4	FMA 5	FMA 6	FMA 7	FMA 8	FMA 9	FMA 10	Unknown Area
1991-92	68	2	2	1	12		13	1			
1992-93	93	3	1	2			1	1		0	
1993-94	11	84	0	0		0	4	0	0		
1994-95	36	10	0	0	9		28	0	15		1
1995-96	66	17	2	0	8	0	2	0		0	5
1996-97	33	5	15	0	12	3	31	0			0
1997-98	37	16	3		18		21	0	4		1
1998-99	26	22	5		23		19	0	1		5
1999-00	49	10	4	0	21		9	0	3	2	2
2000-01	59	17	1	0	14		5	0	2	3	0
2001-02	53	21	0	0	13	0	8	0	1	3	0
Total	45	21	2	0	14	0	11	0	2	2	1

Catch by method

- 98 Less than 2% of the landings reported on CELR (landed) and CLR forms were also reported on CELR (estimated catch) and TCEPR forms over the fishing years 1998–99 to 2001–02, so no breakdown of catch by target species, fishing method or statistical area can be provided. However, catches were reported mainly from midwater trawl, bottom longline and surface longline fisheries.

Targeted catch and bycatch

- 99 For the same reason as mentioned above, it is not possible to provide a good breakdown of the target species when fishers took blue shark. However, the main target species, from the limited data available appear to be bigeye tuna, albacore, southern bluefin tuna, groper, bluenose, hoki and alfonsino.

Number of vessels catching and landing

- 100 The increase in reported landings over recent years is probably due to a combination of better reporting and/or increased effort in the tuna long-line fishery resulting in higher blue shark bycatch. There has been a significant increase in effort. The number of hooks set per year has increased from two to four million in the mid 1990s to eight to ten million at present. The number of surface longline vessels has also increased from 43 in 1990-91 to 133 in 2001-02.
- 101 The number of vessels reporting landings of blue shark by year is shown in Table 4. There has been a general increase in the number of boats reporting landings of blue shark, while boats also reported more landings of blue shark each year. Some of the increase in recent years can be attributed to improved reporting.

Table 4: Number of landings of blue shark by vessel for fishing years 1990-91 to 2001-02

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vessels	34	18	25	50	73	94	95	81	103	100	136	165	191
Landings /vessel	2	1.7	2.7	2.2	3.5	3.7	4.0	2.9	3.8	4.2	5.8	9.4	10.4

^aFishing year '1990' is fishing year 1989-90

Recreational catch

- 102 The National Marine Recreational Fishing Surveys in 1992-94, 1996, and 2000 do not provide any estimates of the recreational harvest of blue shark. Blue shark is not highly prized as a game fish and the recreational catch probably consists mainly of sharks caught incidentally while targeting mako sharks or tunas. Blue sharks have been tagged by recreational fishers in New Zealand since 1975. Up to June 2000, 2 947 blue sharks had been tagged. They were mainly tagged off east Northland, Wairarapa, and Dunedin.

Customary catch

- 103 There is no quantitative information available to allow the estimation of the harvest of blue shark by customary Māori fishers. Based on MFish's general understanding of the customary and recreational fishery, MFish considers that the customary harvest is likely to be low.

Regulatory Framework

- 104 There are no existing regulations that specify catch limits or other sustainability measures for blue shark. There is no minimum size limit for blue shark for non-commercial or commercial fishers. There is amateur bag limit of one blue shark per day in South-East, Southland, and Sub-Antarctic FMAs. There is no species-specific or "combined species" bag limit regulations for blue shark in any other FMAs. There are no regulations that apply to blue shark that could be considered redundant as a result of entry into QMS.

Fisheries Assessment

- 105 There is no stock assessment information available for blue shark in New Zealand fisheries waters.
- 106 New Zealand has obligations under international agreements, especially the Food and Agriculture Organisation of the United Nations International Plan of Action for Conservation and Management of Sharks (IPOA-Sharks) within the framework of the Code of Conduct for Responsible Fisheries. The objective of the IPOA is to ensure the conservation and management of sharks and their long-term sustainable use. Guiding principles for the Plan of Action are that states that contribute to fishing mortality on a species should participate in its management, the precautionary approach should be applied to ensure sustainable management, and that management objectives and strategies should recognise the nutritional and socio-economic aspects of shark fisheries.

- 107 The IPOA-Sharks is voluntary, but proposes that states should develop a national plan of action for the conservation and management of shark stocks if their vessels catch sharks in targeted or non-targeted fisheries. MFish is to engage in the development of a National Plan of Action (NPOA) for sharks that will help provide a coordinated response to shark management issues in New Zealand fisheries waters.
- 108 While there is a general obligation to conserve and manage, there are no specific international obligations with regard to blue shark that require catch controls at this stage, although in the future it is possible that the Western and Central Pacific Fisheries Commission will adopt measures for this species.

Associated Fisheries

- 109 Blue shark is an active pelagic predator of fish and squid. As top predators, blue shark probably associate with their main prey, but little is known of their relationships with other species. Overfishing of blue shark, it being an apex predator, could result in changes to predator/prey relationships and community structure. Understanding of food web relationships is still at an early stage, but MFish considers that if evidence emerges of impacts on biodiversity from harvesting of blue shark, this can be managed at that time based on international cooperation where appropriate

Environmental Issues

- 110 Blue shark is predominantly taken as bycatch in the tuna longline fisheries for southern bluefin, bigeye and albacore, and is also caught by bottom longliners and midwater trawlers in New Zealand fisheries waters. As blue shark is solely a bycatch fishery, the environmental impacts of fishing need to be considered under the management provisions of the target species, in particular the environmental aspects associated with the tuna longline fishery.

Research

- 111 There has been directed fisheries research on fish bycatch in tuna longline fisheries including blue shark in the past. Research support for the Gamefish tagging program continues and work is underway to assess the age and growth of blue shark in New Zealand fisheries waters.

Social, Cultural, and Economic Factors

- 112 MFish is not aware of any information on particular social, economic, or cultural matters that would influence the setting of TACs and TACCs for blue shark beyond those considered in the relevant sections earlier.

BLUE SHARK (BWS) – FINAL ADVICE

Initial Proposal

- 1 The initial position paper (IPP) proposed to set the following TAC, allowances for customary fishing interests, recreational interests and other sources of fishing-related mortality, and TACC for the blue shark (*Prionace glauca*) stock (BWS 1) being introduced into the QMS on 1 October 2004 (refer Table 1).

Table 1: Proposed TAC, Allowances, and TACC for BWS 1 in tonnes

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
BWS 1	2080	10	20	190	1860

- 2 This proposal was part of a package of measures regarding the introduction of blue shark into the QMS. Other measures proposed for this stock, included:
 - a) Listing blue shark on the Third Schedule of the 1996 Act, so that blue shark can be managed with an alternative TAC that need not consider MSY;
 - b) Listing blue shark on the Sixth Schedule to the 1996 Act, so that blue shark may be returned to the sea in accordance if they are:
 - i) Likely to survive;
 - ii) Returned to the same waters from which they are taken; and
 - iii) Are returned as soon as practical.
 - c) Reviewing the conversion factor for blue shark;
 - d) Amending the reporting regulations to ensure that the appropriate fishstock code for blue shark is used under the QMS; and
 - e) Setting a deemed value, but no differential deemed value or overfishing threshold.

Submissions

- 3 Ten submissions were received on the blue shark proposals from the following submitters:
 - **P Clarke**
 - **D Glass**
 - **D McIntosh**
 - **New Zealand Big Game Fishing Council (NZBGFC)**
 - **Seafood Industry Council (SeaFIC)**
 - **Sanford Limited (Sanford)**
 - **Sealord Group Limited (Sealord)**
 - **Te Ohu Kai Moana (TOKM)**

- **Tolaga Bay East Cape Charters (TBECC)**
 - **Te Rūnanga o Ōtākou**
- 4 The specific submissions on the proposals for blue shark are summarised and addressed under the relevant following headings below.

Biological and Fishery Information

Submissions

- 5 No submissions raised issues concerning the biological or fishery information for blue shark provided in the IPP (refer para 85-91).

MFish Discussion

- 6 The IPP contains a discussion of biological and fishery information (refer IPP para 85-101). Since the release of the IPP, NIWA has provided corrections to the commercial landing information provided to MFish for use in the IPP to calculate the BWS 1 TAC/TACC (refer Table 2). Commercial landing and discard information is also now available for the most recent fishing year (2002-03).

Table 2: Commercial landings and discards (t) of blue sharks reported by fishers (CELRs and CLRs) and processors (LFRRs) by fishing year.

Year	CELR and CLR		Total Reported	LFRR
	Landed	Discarded		
1989-90	12	0	12	5
1990-91	2	0	2	3
1991-92	18	0	18	13
1992-93	39	0	39	33
1993-94	370	1	371	118
1994-95	251	2	254	140
1995-96	145	6	152	166
1996-97	131	31	161	303
1997-98	518	32	551	537
1998-99	528	48	576	525
1999-00	629	12	641	1 031
2000-01	1119	48	1177	1 415
2001-02	1019	57	1076	1 105
2002-03	907	61	968	1 003

Environmental Considerations

Submissions

- 7 No submissions were received regarding the environmental considerations outlined in the IPP in relation to fishing for blue shark.

MFish Discussion

- 8 As noted in the IPP (refer IPP para 110), blue shark is taken as a bycatch of the tuna longline fishery. Specific comment regarding the role of blue shark as an apex

predator is contained in the IPP. Further, the environmental impacts of fishing need to be considered under the management provisions of the target species.

TACs, Allowances and TACC setting considerations

Submissions

Recreational Allowance

- 9 Submitter **D. Glass** notes there is a significant disparity between the proposed recreational allowance and the TACC and allowances for customary and other fishing-related mortality. D Glass contends that the recreational and customary allowances for blue shark are not adequately provided for.
- 10 **NZBGFC** notes that their records show a marked decline in recreational blue shark catch over the last seven years. NZBGFC attributes this decline to the expansion of the domestic surface longline fleet in northern New Zealand. NZBGFC illustrate the decline by providing data from the NZBGFC yearbooks showing that the total number of blue shark caught has steadily declined from 926 in the 1997-98 to 93 in the 2002-03 fishing seasons.

Customary Allowance

- 11 **Te Rūnanga o Ōtākou** notes that the Minister is required to develop policies to help recognise the use and management practices of takatā whenua in the exercise of customary non-commercial fishing rights. Te Rūnanga o Ōtākou requests that 25% of the TAC be provided as a non-commercial allowance, of which 80% should be provided as a customary allowance. Te Rūnanga o Ōtākou requests this allocation to avoid the risk of commercial and non-commercial users coming into conflict in the future. Such an allocation would provide an effective means for Kaitiaki Runaka to exercise their kaitiakitaka responsibility.

Other Sources of Fishing-Related Mortality Allowance

- 12 No submissions regarding other sources of fishing-related mortality were received.

TACC

- 13 **Te Rūnanga o Ōtākou** requests that a precautionary approach be adopted when setting TACs and TACCs for species where there is no catch history.
- 14 **P Clarke** and **D Glass** consider that the TACC's proposed for the shark species are unlikely to be sustainable based on information contained in the IPP.
- 15 **NZBGFC** considers that an expansion of blue shark catch at this time is inappropriate and that better catch data are needed, perhaps through an Adaptive Management Plan, before introducing blue shark into the QMS. NZBGFC also contends that it is not possible to manage a species under the QMS when there are no robust data on catch.
- 16 **TBECC** submits that surface longlining has decimated blue shark on the east coast of the North Island. TBECC believes any uncertainty over the blue shark stock size

should result in very low quotas until there is certainty that the stock size has increased and can sustain a TAC increase.

- 17 **TOKM** does not support the proposal to set the initial BWS 1 TACC as the average of commercial landings during the past 3 years plus 50% because relative to other shark species blue shark is relatively more productive, cannot be targeted, and is caught by a range of fisheries and methods. In addition, TOKM considers that the generic international concern regarding oceanic shark stocks is barely relevant to blue shark and a restrictive TAC/TACC level will seriously affect fishing for target species.
- 18 TOKM agrees that conversion factors for blue shark are seriously understated but that plucking correction factors 'from the air' to add a load to reported landings is not acceptable. TOKM therefore, wishes to see a review of conversion factors for blue shark.
- 19 TOKM suggests that the TAC/TACC for BWS 1 be set at the best annual commercial catch reported over the last five fishing years, plus a 100% allowance, and review this level after three years. TOKM agrees with the catch levels and allowances provided for recreational, customary, and other sources of mortality.
- 20 **SeaFIC, Sanford and Sealord** have submitted that the BWS 1 TACC should be recalculated using LFR data as a starting point for estimating landings and corrected with the proposed new conversion factors and the estimate of the proportion of pelagic sharks recorded in the generic shark reporting codes. **D McIntosh** advised that he has coded his catch of blue shark to a generic shark reporting code in recent years. SeaFIC, Sanford Limited and Sealord submit that once more accurate catch landing information becomes available the TACC should be reviewed using the low knowledge bycatch fishery framework.

MFish Discussion

TAC

- 21 In setting the TAC under section 14, MFish considers that, in the absence of information to undertake an assessment of the potential yield of blue shark, the TAC should be based on estimates of current utilisation as proposed in the IPP (refer para 22) as it better meets the purpose of the Act than a TAC set at a level based on MSY. MFish has based estimates of utilisation on the best available information, including that contained in the submissions.

Recreational Allowance

- 22 There is little quantitative information on the recreational catch of blue shark and it is not a highly prized game fish. MFish therefore proposed in the IPP that the recreational allowance be set at a nominal 20 tonnes level following consideration of MFish policy guidelines. MFish notes that the average season catch of NZBGFC affiliated clubs between the 1996-97 and the 2002-03 season is 8 tonnes. This is well within the allowance proposed. The IPP contains a discussion of matters relating to the setting of the recreational allowance (refer IPP para 34-36). MFish confirms

that its position on the recreational allowance remains as set out in the IPP and an allowance of 20 tonnes is recommended.

Customary Allowance

- 23 Te Rūnanga o Ōtākou has requested that 25% of the blue shark TAC be provided as a non-commercial allowance. MFish notes the current non-commercial catch of blue shark is low. MFish is of the view that an arbitrary allocation of 25% of the TAC to non-commercial fishers could have an unnecessary economic impact on the commercial target fisheries if yields are constrained. The generic section of this advice provides further comment on the submission of Te Rūnanga o Ōtākou.
- 24 The IPP contains a discussion of matters relating to the setting of the customary allowances (refer IPP para 37-39). MFish confirms that its position on customary allowances remains as stated in the IPP and recommends an allowance of 10 tonnes for customary fishing.

Other Sources of Fishing-Related Mortality Allowances

- 25 The IPP contains a discussion of matters relating to the setting of the allowances for other sources of fishing-related mortality (refer IPP para 40-44). TOKM submit in support of the proposed allowance. MFish confirms that its position on allowances for fishing-related mortality remains as stated in the IPP and recommends an allowance of 190 tonnes.

TACC

- 26 MFish agrees with submitters that estimating commercial catch of blue shark is problematic. The IPP contains a discussion of matters relating to the setting of the TACC (refer IPP para 45-53). MFish agrees with the SeaFIC and supporting submissions that the BWS 1 TACC should be based on Licensed Fish Receiver Return (LFRR) data modified using the proposed conversion factor for the primary landing code for finning (FIN) that is currently out for consultation, together with an estimate of the proportion of pelagic sharks recorded in the generic shark reporting codes.
- 27 However, MFish notes the comments and information supplied by P Clarke, D. Glass, TBECC, and NZBGFC. These four submitters believe that there has been a dramatic decline in the blue shark stock in recent years. MFish also notes that despite improved reporting and sustained fishing effort, over the last three fishing years there has been a consistent decline in the commercial catch of blue shark.
- 28 There are indications of declining BWS 1 landings and sustainability issues associated with the predominant harvest of immature blue shark in the New Zealand fishery. MFish believes that a degree of caution is needed when setting the TAC/TACC prior to the provision of better information anticipated from management under the QMS. MFish therefore considers that commercial data from the three most recent fishing years should be taken into account when setting the TAC and TACC as it reflects the current state of the fishery and is likely to be more accurate than earlier fishing years as a result of recent improvements in the reporting of shark landings. MFish

acknowledges the industry request for a review of the TACC when additional information is available.

- 29 Accordingly, MFish has recalculated the catch of blue shark in the manner requested by SeaFIC and supporting submissions. The recalculated fishing year catch of BWS 1 based on LFRR data from the three most recent fishing years and corrected for the proposed new conversion factor for blue shark fins, together with recorded discards is shown in Table 3. The percentage of the catch landed as finned was obtained from LFRR data. MFish notes that with improved reporting the incidence of blue shark being recorded under the codes of other sharks and dogs (OSD) and shark (SHA) is minimal during the past three fishing years.

Table 3: Fishing year catch of BWS 1 based on LFRR and discard catch data with correction for finned conversion factor.

Fishing Year	LFRR (t)	87% Finned Corrected for 48 Conversion Factor	Discards (t)	Total catch based on LFRR data(t)	TACC Proposed in IPP
2000-01	1415	2154	48	2202	-
2001-02	1105	1682	57	1739	-
2002-03	1003	1527	61	1588	-
3 Year Average	-	-	-	1843	1860

- 31 MFish notes that the commercial catch levels of BWS 1 provided in the IPP from the calculation using a 50% adjustment to account for inconsistencies in reporting and the use of an inappropriate conversion factor, closely matches that recalculated in the FAP. Consequently, MFish does not propose to alter the TACC proposed in the IPP and a TACC of 1860 tonnes is recommended.

Social, Cultural and Economic Factors

Submissions

- 32 **SeaFIC, TOKM, Sanford and Sealord** note that despite the measures MFish is proposing to aid the introduction of blue shark into the QMS, the TACC will be set substantially below actual current landings. They are concerned that TACC set below actual landings will impose significant costs on the fishing industry. These costs include:
- Deemed values penalties to cover catch beyond the TACC;
 - Lost opportunity cost within target fisheries constrained by the availability of annual catch entitlement (ACE for bycatch shark species); and
 - Increased operational costs as fishers are forced to alter fishing practices to avoid catching shark bycatch.

MFish Discussion

- 33 MFish acknowledges that there may be costs to individual fishers that catch blue shark as a bycatch of their fishing operations in having to acquire ACE for their bycatch of sharks and/or in adjusting fishing operations to minimise shark bycatch. The TACC proposed is based on the average catch of the last three years because there are potential sustainability concerns in the fishery. In this circumstance some costs are inevitable. MFish considers that the potential for constraints on target fisheries is mitigated by:
- Allowing the return of live blue shark to the sea under Schedule Six provisions;
 - Setting of low deemed values; and
 - No application of differential deemed values or an overfishing threshold.
- 34 Further, MFish believes that these combined measures will help to minimise economic impacts while encouraging fishers to maximise their economic return from the BWS 1 fishery.
- 35 MFish notes that the provisional catch history years for highly migratory target and bycatch species do not overlap. Therefore, many fishers may not have sufficient provisional catch history to cover their bycatch and there will be likely initial costs associated with acquiring quota or ACE. The majority of quota will initially be held by the Crown. MFish notes that Crown holdings of BWS 1 quota will be sufficient to provide for the 20% allocation required for Maori.
- 36 The IPP contains information relating to social, cultural and economic factors (refer IPP para 112). MFish confirms that its position on social, cultural and economic factors remain as stated in the IPP.

Other Management Measures

Submissions

Third Schedule

- 37 **SeaFIC, TOKM, Sanford and Sealord** support the inclusion of blue shark in the Third Schedule but note that within-season adjustments to the TAC will be impractical because of the difficulties of measuring in-season abundance.

Sixth Schedule

- 38 **SeaFIC, TOKM, Sanford, Sealord and NZBGFC** support the proposal to list blue shark on the Sixth schedule.

Review of Conversion Factors

- 39 **SeaFIC, TOKM, Sanford, and Sealord** support the need to review conversion factors to ensure accurate estimates of landings, but consider the TACC should be set on the basis of current catch using the new conversion factor.

Deemed Value and Overfishing Threshold

- 40 **SeaFIC, TOKM, Sanford and Sealord** agree with the proposals for blue shark to set the annual deemed value at 60% of the port price and not setting an overfishing threshold for blue shark.

Shark Finning

- 41 **TOKM, NZBGFC and TBECC** have submitted in opposition to the practise of shark finning and the need to provide incentives for fishers to fully utilize their shark bycatch or release it alive. NZBGFC and TBECC further submit that, for New Zealand to conform to international developments, shark finning should be prohibited.

MFish Discussion

- 42 MFish notes the support of industry for the package of additional management controls proposed in the IPP to assist the introduction of blue shark into the QMS. Accordingly MFish recommends that blue shark is added to the Sixth Schedules of the Act as proposed in the IPP. Specific conditions proposed for the Sixth Schedule listing are that the blue sharks are likely to survive and must be returned to the same waters from which they were taken as soon as practicable. Separate advice recommends the addition of blue shark to the Third Schedule of the Act
- 43 Submissions support the proposal in the IPP to review the conversion factor for blue shark. A detailed proposal has been released for further consultation.
- 44 MFish is concerned to avoid an increase in the demand for blue shark that would occur from providing for the development of target fisheries. However, it does not wish to impose unreasonable constraint on fishers particularly during a period of rationalisation of the tuna longline fishery. Taking these matters into account MFish has proposed that the TACC be set on the basis of average catch.
- 45 Current catch should be sufficient to satisfy demand in the fishery for bycatch but added flexibility provided by the Sixth Schedule provision that provides for the release of live blue sharks in the event the level of the TACC is constraining. In this environment MFish considers that deemed values for blue shark should be on the lower end of the continuum between port price and the transaction costs involved in acquiring and or holding a quantum of ACE. This will also reduce the potential for deemed values to distort the market for ACE during the period of transition of blue shark into the QMS.
- 46 For this reason, while MFish notes the support in submission for setting deemed values at 60% of the port price for blue shark, MFish proposes that deemed values are set at a lower level. A nominal deemed value of \$0.15/kg was suggested in the IPP. A port price of \$0.68 has now been determined for blue shark. MFish acknowledges that the deemed value level should be linked more appropriately to the ACE value but

this value is not known at this time. Therefore, MFish proposes to retain the deemed value proposed in the IPP (\$0.15/kg), which now represents 22% of the port price but is above the likely transaction and levy costs anticipated for this fishery.

- 47 MFish considers that the QMS will provide strong incentives to reduce the practise of landing only the fins of shark bycatch because individual fishers will be constrained by ACE holdings and there will be a financial incentive to maximise the return on the ACE held. MFish considers that fishers will attempt to maximise their returns from their ACE holdings by landing both carcass and fins. MFish therefore anticipates a reduction in shark finning for blue shark once it is introduced into the QMS on 1 October 2004. The blue shark fishery will be monitored to determine whether this is the case.

Legal Obligations

- 48 The statutory considerations that must be taken into account when setting a TAC and allowances for blue shark were identified in the IPP (refer to IPP para 66). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Conclusion

- 49 In the IPP, MFish proposed a TAC, allowances and TACC for the blue shark stock (BWS 1) to be introduced into the QMS on 1 October 2004 (refer Table 1) and provided a summary of the species biology, a characterisation of the fishery and an overview of the present regulatory framework.
- 50 There is no information to make an assessment of the potential yield of blue shark. MSY cannot be estimated for blue shark, as the fish found in New Zealand are only part of a wide-ranging stock. Consequently, MFish has proposed that blue shark be included on the Third Schedule to the Act and proposes that the TAC be set pursuant to s 14 of the Act. Any TAC set under s 14 of the Act can be set at a level that is not based on MSY provided that the TAC better meets the purpose of the Act than a TAC set under section 13(2).
- 51 In the absence of estimates of sustainable catch it is proposed to base the BWS 1 TAC on an estimate of current utilisation. There was new information in submissions and from NIWA on commercial and recreational landings of blue shark. MFish has recalculated recent commercial landings using the new information in the manner requested by industry. The recalculation of commercial landings and the recreational landing information confirmed the commercial and recreational catch estimated by MFish in the IPP
- 52 MFish has considered the best available information on catches, habitat and biology of the stocks, and statutory considerations in proposing the BWS 1 TAC, allowances and TACC. MFish believes that the TAC proposal is consistent with s 14 and the TACC proposal consistent with s 21. MFish also believes that the proposed TAC and TACC levels provide for utilisation of blue shark while imposing measures to promote its sustainability (s 8).

- 53 Given the indications of a locally declining BWS 1 stock and the sustainability issues associated with the predominant harvest of immature blue shark, MFish believes that an element of caution is needed when setting the TAC/TACC prior to the provision of better information anticipated from management under the QMS. Accordingly, MFish considers that the TACC should be based on the average of the commercial catch of the past three fishing years, but acknowledges the industry request for a review of the TACC when additional information is available.
- 54 MFish notes the support of industry for the package of additional management controls proposed in the IPP to assist the introduction of blue shark into the QMS. Accordingly MFish recommends that the additional management controls proposed in the IPP be implemented when blue shark is introduced into the QMS on 1 October 2004.
- 55 Concerns were raised in submissions about landing only the fins of shark bycatch and most of these proposed that it be banned. MFish considers that the QMS provides strong incentives to maximise the value of bycatch and anticipates an increase in landing both shark fins and carcasses. MFish intends to monitor the blue shark fishery but anticipates a reduction in landing only the fins of shark bycatch once blue shark is introduced into the QMS on 1 October 2004.

Recommendations

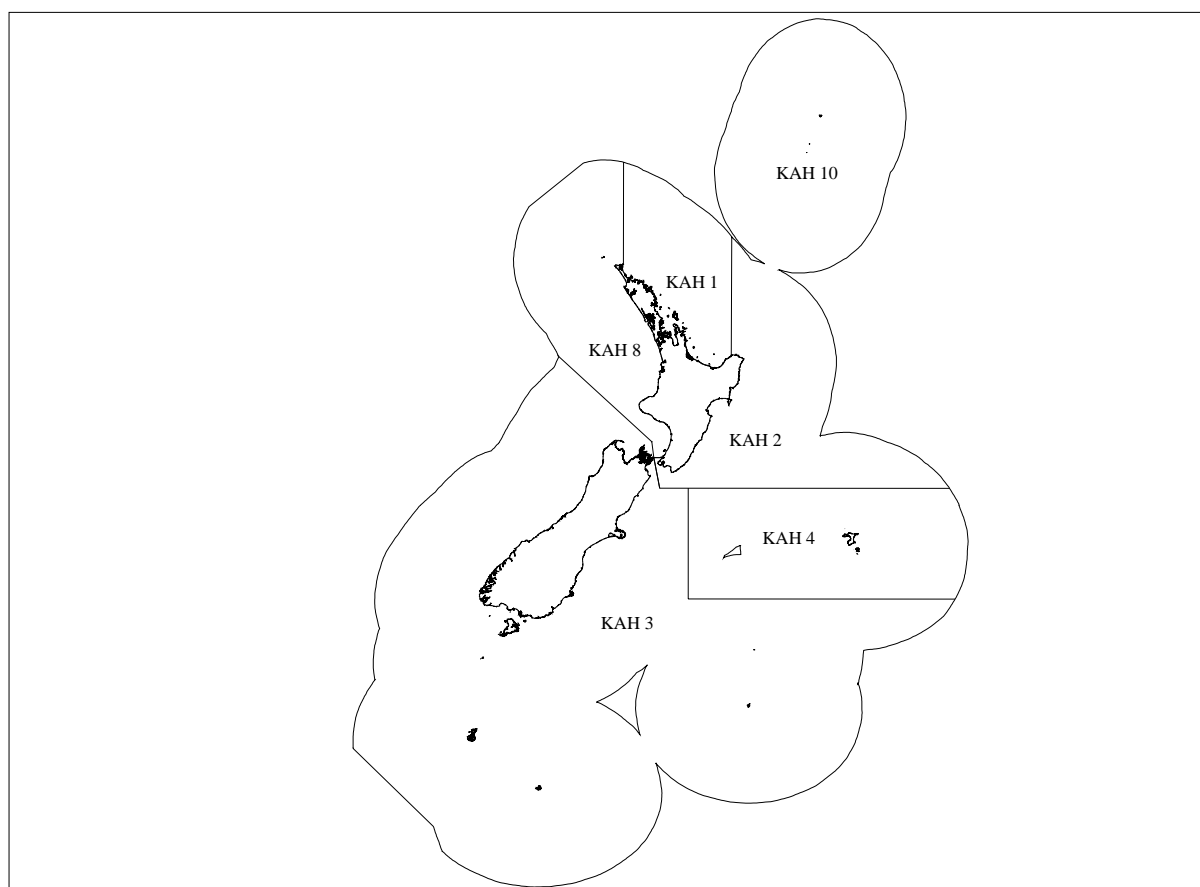
- 56 MFish recommends you:
- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for blue shark otherwise than in accordance with s 13(2).
 - b) **Agree** to set a TAC for blue shark pursuant to s 14 of the Act.
 - c) **Agree** to set a TAC of 2 080 tonnes for BWS 1 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 20 tonnes;
 - iii) An allowance for other fishing-related mortality of 190 tonnes; and
 - iv) A TACC of 1 860 tonnes.
 - d) **Agree** to add blue shark to the Sixth Schedule of the 1996 Act to allow for return to the sea with the following conditions
That they are:
 - i) Likely to survive
 - ii) Returned to the same waters from which they are taken; and
 - iii) Are returned as soon as practical.
 - e) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.
 - f) **Agree** to set the deemed value for BWS 1 at \$0.15/kg.
 - g) **Note** that a separate review of the conversion factor for blue shark, landed as fins only, is in train.

KAHAWAI (KAH) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Kahawai (*Arripis trutta* and *A. xylabion*) has been gazetted for introduction into the QMS on 1 October 2004. The Quota Management Areas (QMAs) for kahawai are outlined in Figure 1. The fishing year for kahawai will be from 1 October to 30 September in the following year and the total allowable commercial catch (TACC) and annual catch entitlement (ACE) are to be expressed in terms of kilograms greenweight.

Figure 1: Quota Management Areas for kahawai



Key Issues to be considered

- 2 MFish considers the key issues that relate to the decisions for setting sustainability measures for kahawai stocks are as follows:
 - a) There are two species of kahawai present in New Zealand waters, kahawai and northern kahawai. A stock assessment applies to kahawai and there is very little information available for the other species;
 - b) Kahawai biomass had declined to about 50% of the virgin biomass at the time of the assessment in 1996, however the current biomass is unknown. Nationwide combined estimates of recreational catch, customary catch and

reported commercial landings are currently just within the range of MCY estimates based on the 1996 stock assessment;

- c) Background information on catch by sector and method is outlined in Annex One. While primarily a purse seine fishery in QMA 1, 2 and 3, kahawai is almost entirely taken as bycatch in QMA 8. Commercial catch limits (CCLs) apply to kahawai, with specific limits pertaining to purse seining;
- d) Since the imposition of CCLs catches, although fluctuating, have progressively declined principally in QMA 3. Declining catch in QMA 3 is associated with reduced purse seining in this area;
- e) Recreational catch is about 83% of commercial landings as estimated by recreational harvest surveys. Kahawai is one of the fish species most frequently caught by recreational fishers;
- f) The recreational sector believes that the number of kahawai available to them and the average size of kahawai has decreased over time; and
- g) Kahawai supports important Māori customary fisheries but the size of the catch is unknown.

List of Management Options

- 3 MFish proposes that the s 13 management arrangements are appropriate for kahawai.
- 4 MFish proposes one option for setting TACS, TACCs and allowances for kahawai stocks as outlined below.

Table 1 Proposed TACs, TACCs, and allowances for kahawai (tonnes greenweight).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
KAH 1	3 910	790	1 580	60	1 480
KAH 2	1 510	255	510	35	710
KAH 3	960	150	300	20	490
KAH 4	18	3	5	0	10
KAH 8	1 210	190	380	5	635
KAH 10	18	3	5	0	10

- 5 Additional management controls proposed include:
 - a) Setting deemed values and application of differential deemed values;
 - b) Amending reporting regulations, and
 - c) Revoking certain fishing permit conditions. These conditions are redundant as they relate to the closing of the purse seine fishery once purse seine limits for kahawai have been reached.

TACs

TAC management strategy

- 6 Section 13 of the Act represents the default management option that is to be applied when setting a TAC for a QMS stock, unless the stock size is considered highly variable from year to year or it qualifies for management under the criteria outlined in s 14 or s 14A of the 1996 Act. MFish does not consider that kahawai stock sizes are highly variable from year to year. In order for a stock to be added to the Third Schedule under the provisions of s 14, the biological characteristics of the species must prevent the estimation of B_{MSY} , the catch limit for any of the stock must form part of an international agreement, or the stock must be managed on a rotational or enhanced basis. Kahawai does not meet any of these criteria. Section 14A enables the Minister to set a TAC that maintains the stock at a level that ensures its long-term viability, while other inter-related stocks can be taken at TAC and TACC levels based on B_{MSY} . MFish does not consider that s 14A is applicable to kahawai fisheries because:
- There is no associated species that requires commercial fishing to that level;
 - There would be detrimental effects on non-commercial fishing interests; and
 - Of the potential for adverse ecosystem effects.
- 7 MFish believes that the s 13 management arrangements are appropriate for kahawai. Under s 13 there is a requirement to maintain a fishstock at a target stock level, being at, or above, a level that can produce the MSY, having regard to the interdependence of stocks. MSY is defined, in relation to any fishstock, as being the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the population dynamics of the stock and any environmental factors that influence the stock.
- 8 As outlined in the Statutory Obligations and Policy Guidelines section, there are guidelines for setting TACs for new species. Among the more important considerations for kahawai are the level of current utilisation, existing stock assessment information, the current commercial purse seine limits, the biological and fishery characteristics of the stock, implications for interdependent stocks, and whether the target level for the TAC can provide benefits that will improve utility from the available harvest. An overlying consideration is the importance of kahawai as a shared fishery between commercial and non-commercial fishing interests.

Rationale for proposed TACs

- 9 Policy guidelines have constructed a hierarchal approach in respect of the information for setting TACs and hence the weighting to be assigned to that information. Stock assessment information is afforded greater weight than a non-QMS catch limit set for the stock. A CCL may be afforded greater weight than information about historical and current catch levels.
- 10 Estimates of virgin and 1996 biomasses, and an estimate of maximum constant yield (MCY) for a single nationwide kahawai stock are available. MCY and its relevance

to the setting of TACs are discussed in the Report from the Fishery Assessment Plenary¹.

- 11 A discussion of the stock assessment model for kahawai is provided in the Fisheries Assessment section in Annex Two. Given the history of exploitation, the kahawai stock is not likely to be at or near its virgin biomass (B_0). Modelling suggests that the fishery was at approximately 50% of B_0 in 1996. The introduction of purse seine limits has been effective in limiting commercial catches since 1993-94 and the biomass may have stabilised since that time. However, trends in non-commercial catch during this period are unknown. Recreational catch is a significant proportion of the fishery.
- 12 There is uncertainty about the level of current biomass levels and the applicability, for setting current yields, of using the 1996 stock assessment. This is because the assessment is not only uncertain but also some seven years out of date.
- 13 For the 1990-91 fishing year, the Minister agreed that a total commercial catch limit should be 6 500 tonnes (based on a value derived from a compromise between the average commercial landings for 1983-86 of 5 000 tonnes and the average commercial landings for 1986-89 of 8 500 tonnes) with 650 tonnes of this total set aside for Māori. As an interim measure until introduction of kahawai into the QMS, the Minister decided to set specific limits pertaining only to purse seining. Commercial catch limits (CCL) were set by dividing the 5 850 tonne catch limit amongst the FMAs in proportion to the average purse seine landings relative to the other commercial fishing method landings reported during the period 1987-89: 1 666 tonnes for FMA 1, 851 tonnes for FMA 2, 2 339 tonnes for FMAs 3-8 and 0 tonnes for FMA 9.
- 14 While national catches decreased during 1991-92, landings in FMA 1 increased and for 1993-94 the competitive catch limit for purse seining in FMA 1 was reduced from 1 666 tonnes to 1 200 tonnes and any purse seine catches reported for FMA 9 were included in this catch limit. No changes have been made to the purse seine limit of 851 tonnes for FMA 2. The purse seine catch limit for FMAs 3-8 was reduced from 2 339 to 1 500 tonnes from 1995-96.
- 15 MFish does not support using the current CCLs as a basis for setting TACs. This is because the CCLs pertain only to purse seining, have no stock assessment as their basis, and are based on landings data.
- 16 In the instance of a commercial fishery that is stable, but variable, guidelines suggest criteria to set catch limits on the basis of either the current commercial catch or on average catches when landings have been stable in excess of three years. Commercial landings of kahawai declined between 1988 and 1998 and have stabilised thereafter, particularly in the important management areas QMA 1 and QMA 2. Accordingly, the proposed TACs have been calculated using average commercial landings for the period between 1997 and 2002 as MFish considers this relatively stable period provides the best available information on current levels of commercial utilisation. It

¹ Guide to Biological Reference Points for the 2002-2003 Fisheries assessment Meetings in Report from the Fishery Assessment Plenary, May 2003: stock assessments and yield estimates Part 1: Albacore to Ling. . J Annala et al Comps and eds

is also broadly consistent with the method for evaluating the current recreational utilisation.

- 17 The average of the two most recent estimates of recreational landings has been used to estimate current recreational utilisation of the fishery.
- 18 For species and stocks where there is some catch, but the stock is not considered of importance to customary Māori, then current utilisation may be estimated on the basis of half the recreational catch. Kahawai is of considerable interest to Māori in some areas, however there is no information on customary harvest. MFish considers that, even though it is important as a customary fishery, the level is unlikely to equal the level of the recreational fishery and proposes to use 50% of the current level of recreational utilisation as an estimate of current customary harvest.
- 19 Combined estimates of current utilisation for the non-commercial and commercial sectors are currently assessed to be about 7 600 tonnes.
- 20 Another consideration for TAC setting is that recreational fishers value kahawai far greater than commercial fishers (see Social, Cultural and Economic factors in Annex Two). Current recreational perceptions are of a decline in the availability of kahawai. The current proposal to set TACs at the level of current utilisation assumes that these perceptions are associated with a reduction in the kahawai stock to a level at or above B_{MSY} and not below that level.
- 21 Recreational interests are most likely best served by stocks that are maintained above B_{MSY} as size and availability of fish is increased in comparison to those available at a smaller biomass. The stock assessment is uncertain and outdated and targets above B_{MSY} are not proposed. In the absence of a stock assessment, the MFish preferred policy is to use current utilisation as a basis for determining both TACs and allocation. However, the shared nature of the fishery is relevant when considering the risks with respect to the uncertain information for setting sustainable yields for the stock.
- 22 Recreational interests believe the overall reduction in kahawai schools might be having an effect on interdependent stocks of predators such as marlin and tuna. MFish notes that the factors influencing the distribution of highly migratory stocks of species such as marlin and tuna is complex and not well understood. While the availability of prey might be one important factor in the seasonal availability of these species, kahawai may provide only a component of any potential food source. Nevertheless, the importance of species such as kahawai as a food source suggests the need for caution when setting catch limits.
- 23 In summary, MFish proposes that TACs be based on estimates of current utilisation. Although relevant, the stock assessment information is uncertain and dated. The CCLs pertain only to purse seining, are based on dated landings data and have no stock assessment basis. While commercial landings have been relatively stable, trends in non-commercial catch are unknown. Estimates of utility suggest that kahawai is much more greatly valued by the recreational sector. However, rather than suggesting alternative stock targets, MFish considers that the disparity in relative value between the sectors supports the need for caution in setting catch limits for the fishery.

- 24 MFish notes that combined estimates of non-commercial and commercial utilisation for kahawai stocks are currently just within the range of the estimates for MCY (7 600-8 200 tonnes). MFish proposes setting TACs that coincidentally lie on the lower bound of the MCY estimate (ie, 7 600 tonnes).

KAH 1

- 25 MFish proposes a TAC for KAH 1 of 3 910 tonnes based on current utilisation of the fishery.

KAH 2

- 26 MFish proposes a TAC for KAH 2 of 1 510 tonnes based on current utilisation of the fishery.

KAH 3

- 27 MFish proposes a TAC for KAH 3 of 960 tonnes based on current utilisation of the fishery.

KAH 4

- 28 Only very small amounts of catch have been reported in FMA 4. MFish proposes a nominal TAC of 18 tonnes for KAH 4.

KAH 8

- 29 MFish proposes a TAC for KAH 8 of 1 210 tonnes based on current utilisation of the fishery. MFish notes that ACE will primarily be required to cover the bycatch of fishing for other species in KAH 8.

KAH 10

- 30 No catch has been reported in FMA 10. MFish proposes a nominal TAC of 18 tonnes for KAH 10.

Allocation of TAC

- 31 The TAC constitutes a composite of the respective stakeholder groups' catch allocations, plus any other fishing-related mortality. When setting any TAC, a TACC must be set, as well as allowances determined for the Māori customary and recreational fishing interests and for any incidental fishing related incidental mortality.
- 32 The 1996 Act stipulates a process by which the TAC is to be allocated. However, no explicit statutory mechanism provides guidance as to the apportionment of the TAC between sector groups either in terms of a quantitative measure or prioritisation of allocation.
- 33 There is information available for both catch history (current utilisation) and for utility value. In shared fisheries MFish has a policy preference in favour of the catch history

allocation model in the absence of clear information to the contrary. While the utility based model is not discounted altogether its application to kahawai is problematic as the information is uncertain.

- 34 MFish notes that current levels of utilisation for all sectors combined can be accommodated within the proposed TACs. This suggests that currently there is no scarcity within the fishery and therefore no clear-cut requirement to consider reallocating the fishery between sector groups on the basis of utility value or any other considerations.
- 35 Accordingly, the proposed allowances and TACCs have been calculated using average commercial landings for the period between 1997 and 2002 as MFish considers this relatively stable period provides the best available information on current levels of commercial utilisation. It is also broadly consistent with the method for evaluating the current non-commercial utilisation.
- 36 The Minister is required to make separate decisions on allowances and TACCs for each stock. MFish propose allowances and TACCs as shown in Table 1.

Recreational Allowance

- 37 The proposed recreational allowances in tonnes for each QMA are set out in Table 1.
- 38 The average of the two most recent estimates of recreational harvest has been used to estimate current recreational utilisation of the fishery. Because the recreational harvest surveys report on the fishstock codes an arbitrary amount (54 tonnes) was removed from the KAH 3 estimate and added to the KAH 9 estimate to account for area changes in establishing KAH 8.

Māori customary allowance

- 39 The proposed customary allowances for each QMA are set out in Table 1.
- 40 Policy guidelines provide several options for setting a customary allowance. Where estimates are not available, but there is known to be customary catch, a nominal allowance may be made. For stocks of importance to customary Māori the allowance may be based on the level of the recreational catch. For species and stocks where there is some catch, but the stock is not considered of importance to customary Māori, then the allowance may be based on half the recreational catch.
- 41 Exploitation of kahawai dates from the early settlement of New Zealand when they formed a substantial food source for Māori. In pre-European times large catches were often dried or smoked and stored for later use. Kahawai is a known target species for customary purposes especially on the seasonal runs around river mouths such as the Motu River in the Eastern Bay of Plenty. Large catches are still preserved for subsistence by smoking and bottling. Kahawai has a broad coastal distribution and can also be found in harbours, particularly in northern New Zealand. A significant level of customary catch could be anticipated in these areas. Māori have had an historic interest in kahawai and it is an important food source in some localities. MFish would welcome submissions, particularly from Māori customary fishers, that provide information about levels of customary kahawai catch.

- 42 No quantitative estimates of customary fishing for kahawai are available. It is unlikely that customary catch is at or near the level of the recreational catch. While kahawai is considered to be an important customary species, the numbers of recreational fishers taking this species is likely to significantly exceed the numbers of customary fishers. Further, a proportion of the customary catch is probably taken within the bounds of the daily recreational allowance of twenty kahawai per person.
- 43 In the absence of quantitative information MFish proposes a customary allowance set at 50% of the current level of recreational utilisation.

TACCs

- 44 Proposed TACCs in tonnes for each QMA are set out in Table 1.
- 45 The proposed TACC has been calculated using average commercial landings for the period between 1997 and 2002. This may understate or overstate current commercial utilisation in terms of the period chosen for some management areas. MFish notes that commercial landings of KAH 1, KAH 2 and KAH 3 were greater between 1988 and 1997 and accordingly extending the years used to calculate average commercial landings could potentially increase estimates of current commercial utilisation. Any potential impact from adopting different estimates of current utilisation can be measured as direct opportunity costs. A tonne of kahawai has a value and any reduction in tonnage for the commercial sector as a result of a lower TACC can be measured in terms of a forgone value. MFish considers that any such impacts can best be measured by forgone annual earnings as provided by the port price of kahawai (\$430 per tonne).
- 46 The commercial kahawai fishery is seasonal primarily because it is the off-season target of other species and subject to voluntary seasonal fishing arrangements. It is likely that within a QMS management regime this pattern of the fishery will not change. However, quota for kahawai will need to be retained to cover the bycatch of fishing for other species.

KAH 1

- 47 There is one TACC option proposed for KAH 1. Based on the average of the last five years commercial landings from this management area it is proposed that the TACC be set at 1 480 tonnes. This proposed TACC exceeds the current purse seine limit of 1 200 tonnes and provides for anticipated bycatch levels. MFish assesses there will be little if any socio-economic impact associated with adoption of this option because it is based on current levels of commercial utilisation.

KAH 2

- 48 There is one TACC option proposed for KAH 2. Based on the average of the last five years commercial landings from this management area it is proposed that the TACC be set at 710 tonnes. Although based on average landings, the proposed TACC is less than the current purse seine limit of 851 tonnes and the most recent years catch of 832 tonnes. MFish assesses there is likely to be little (\$52 030 forgone earnings on the 2001-02 catch) socio-economic impact associated with adoption of this option because it is based on current levels of commercial utilisation.

KAH 3

- 49 There is one TACC option proposed for KAH 3. Based on the average of the five years commercial landings from this management area it is proposed that the TACC be set at 490 tonnes. This proposed TACC is less than the current purse seine limit of 1 500 tonnes. MFish notes that declining catches in QMA 3 is associated with reduced purse seining in this area. MFish assesses there is likely to be little if any socio-economic impact associated with adoption of this option based on current levels of commercial utilisation.

KAH 4

- 50 There is one TACC option proposed for KAH 4. Based on a nominal value it is proposed that the TACC for this management area be set at 10 tonnes. MFish considers this TACC appropriately reflects the current level of use in this fishery.

KAH 8

- 51 There is one TACC option proposed for KIN 8. Based on the average of the five years commercial landings from this management area it is proposed that the TACC be set at 635 tonnes. This proposed TACC provides for current levels of bycatch. MFish assesses there will be little if any socio-economic impact associated with adoption of this option because it is based on current levels of commercial utilisation.

KIN 10

- 52 There is one TACC option proposed for KAH 10. Based on a nominal value it is proposed that the TACC for this management area be set at 10 tonnes. MFish considers this TACC appropriately reflects the current level of use in this fishery.

Allowance for other sources of mortality

- 53 There is no information on the current level of illegal catch. Accordingly, it is suggested that no allowance is made to cover illegal catch at this time.
- 54 The Report from the Fishery Assessment Plenary states that there is no information on other sources of mortality apart from juvenile kahawai, which may suffer from habitat degradation in estuarine areas. Nevertheless, MFish notes that the majority of kahawai is taken by purse seine (a bulk fishing method). There are a number of sets where the purse is set but no catches are recorded, possibly because of gear failure or other related factors. Some incidental fishing related mortality is likely especially in instances of gear failure. MFish proposes that a nominal allowance of 5% of the average purse seine reported landings for the last five years be set in accordance with the legislative requirement to provide for an allowance of other sources of fishing relating mortality.

Other Management Measures

Method Restriction

- 55 The recreational sector believes that there is conflict with commercial fishing for kahawai, particularly with purse seiners and set netters. These concerns are currently mitigated by voluntary agreements² and by an outcome of the set net review³.
- 56 There is currently no provision for considering spatial allocation within the process of setting sustainability measures and therefore continued voluntary arrangement between sectors to retain these measures for kahawai might be necessary with kahawai in the QMS.

Consequential amendment to regulation

- 57 As a consequence of the introduction of kahawai into the QMS, MFish proposes to revoke certain fishing permit conditions. These conditions relate to the closing of the purse seine fishery once purse seine limits for kahawai have been reached. In addition, MFish proposes to introduce a number of amendments to the reporting regulations to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this paper.

Schedule 5A

- 58 MFish does not propose to list any kahawai stock on Schedule 5A of the Act and proposes to allow under-fishing rights to be carried forward.

Deemed values and Over-fishing threshold

- 59 A separate section of this document sets out generic information on the setting of interim and annual deemed values.
- 60 Application of the policy framework for deemed values would mean kahawai falls within the “all others” fishstock category. The port price for kahawai is \$0.43 (early 2003 MFish port price survey). The standard factor of the port price for species in this category is 75%. The proposed annual deemed value would therefore be \$0.32, while the interim deemed value would be set at \$0.16.
- 61 MFish acknowledges, however, that overcatch of the kahawai TACCs will affect the interests of the non-commercial fishers in a fishery they highly value. MFish also notes the following influences upon the kahawai port price:
- Lower port prices reported by vertically integrated companies (those that catch, process and market).
 - There are niche markets such as those for smoked kahawai that attract

² There are voluntary purse seine closures in place in Parengarenga Harbour, Rangaunu Bay, Doubtless Bay, Cavalli Island, The Bay of Islands, Rimariki Island to Bream Head, the Hauraki Gulf, the Bay of Plenty, Cape Runaway to East Cape, Waikahawai Point to Poverty Bay and Hawke Bay to spatially separate non-commercial and commercial sectors. In addition a voluntary moratorium was placed on targeting kahawai by purse seine in the Bay of Plenty between 1 December and the Tuesday after Easter.

³ An outcome of the set net review was that commercial set netting was prohibited by regulation from 26 locations.

substantially more than average prices.

- 62 Accordingly, MFish recommends an additional option of applying a factor of 200% to the port price, which would derive an annual deemed value of \$0.86. Although a departure from the deemed values policy framework, this option would reinforce the importance of ensuring that catch of kahawai is not landed in excess of ACE (a statutory consideration) in light of the importance of kahawai to the non-commercial sector.
- 63 A provisional figure from the November/December 2003 MFish port price survey indicates that the port price for kahawai in areas 1, 2 and 3 could be as high as \$3.50. MFish will review the proposed port price in light of submissions on the IPP and any further port price information that becomes available.
- 64 MFish proposes to set differential deemed values for kahawai stocks. MFish does not propose to set an overfishing threshold for kahawai. MFish considers that the combination of the deemed values proposed and the proportionally increasing deemed values for fishers who exceed their ACE should be an effective set of balancing provisions.

Statutory Considerations

- 65 In evaluating the management options the following statutory considerations have been taken into account.
- a) The management options seek to ensure sustainability of the stock by setting a TAC and other appropriate measures. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers;
 - b) While there is a national stock assessment available for kahawai, MFish considers it to be uncertain and outdated. Nonetheless this stock assessment suggests that the TACs proposed, based on current levels of utilisation, are likely to be at or above B_{MSY} ;
 - c) There are social and economic consequences from setting the proposed TACs. Current recreational concerns with regard to the reduction in availability of kahawai to them are not addressed by setting TACs based on current levels of utilisation. These proposals assume that the decline in availability is associated with the fishing down of the stock to levels at or above B_{MSY} . While there might be a number of possible economic effects those that have been quantifiable are minor. Any opportunity costs needs to be weighed against the uncertainty in current stock status, the value of kahawai as a shared fishery and the importance of this species in an ecological context as both predator and prey;
 - d) Recruitment of kahawai is not known to be particularly variable at the current levels of stock biomass;
 - e) Kahawai fishing is not known to pose a risk to the long-term viability of any associated or dependent species. However, there are recreational concerns about the effect any reduction in kahawai schools might be having on interdependent stocks of predators such as marlin and tuna. Unfortunately, the factors influencing the distribution of highly migratory stocks of these species

are complex and not well understood. They do suggest the need for caution in setting sustainability measures for the stock;

- f) There are no known effects of purse seine fishing on the aquatic environment;
- g) The purse seine method is not known to pose a risk to the maintenance of biodiversity of the aquatic environment. Habitats of particular significance for fisheries management have been identified for KAH 3 and these have been taken into account when preparing this advice. No other habitats of particular significance for kahawai management have been identified;
- h) MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5) are adequately addressed in the management options for kahawai;
- i) MFish is not aware of any considerations in any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to setting TACs for kahawai at this time (as required by ss 11(2)(a) and (b)). MFish is also aware of the provisions of the Hauraki Gulf Marine Park Act 2000. The Hauraki Gulf is defined in that Act to include all coastal waters and offshore islands from near Te Arai Point offshore to the Moko Hinau Islands, and south to Homunga Point (north of Waihi Beach). This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. Kahawai are known to occur within the boundaries of the Hauraki Gulf and MFish considers that the setting of sustainability measures for kahawai will better meet the purpose of the Act;
- j) Before setting any sustainability measure the Minister must also take into account any conservation services or fisheries services, any relevant fisheries plan approved under the Act, and any decisions not to require conservation services or fisheries services. Conservation and fisheries services apply to fisheries generally in order to assess and monitor the impacts of fishing on non-target fish and other species. No fisheries plans exist or are proposed for kahawai (s 11 (2A));
- k) Sections 21(1)(a and b) and (21)(4)(i and ii) and (21)(5) require the Minister to allow for non-commercial fishing interests (recreational and Māori), and other mortality to the stock caused by fishing. The nature of the fishery and the interests of the respective fishing sectors have been influential in recommendations for the setting of the TACC. The commercial kahawai fishery is seasonal primarily because it is the off-season target of other species and subject to voluntary seasonal fishing arrangements. It is likely that within a QMS management regime this pattern of the fishery will not change. However, quota for kahawai will need to be retained to cover the bycatch of fishing for other species particularly in KAH 8. Allowances have been made for recreational and customary interests and for other sources of mortality to the stock caused by fishing. No mātaimai in the QMA applies in the area of the fishery. No area has been closed or fishing method restricted for customary fishing purposes in the QMA that is likely to affect fishing for this pelagic fishery. The voluntary restrictions that have been placed on commercial fishing to protect recreational interests have been considered when making recommendations;

- l) The information used to develop proposals for kahawai refers to an assessment of the stock conducted in 1996. There is uncertainty about this assessment (and it is now some seven years out of date) however, uncertainty and the absence of information is not a reason for failing to provide for utilisation at levels considered to be sustainable, however MFish notes that caution is required in this instance; and
- m) The level of non-commercial catch within New Zealand fisheries waters is uncertain with regard to setting allowances for recreational, customary Māori use and other sources of fishing-related mortality. MFish notes, however, that uncertainty in information is not a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act (s 10 Information Principles).

Preliminary Recommendations

66 MFish recommends that the Minister:

- a) **Agrees** to set a TAC of 3 910 tonnes for KAH 1 and within that TAC set:
 - i) A customary allowance of 790 tonnes;
 - ii) A recreational allowance of 1 580 tonnes;
 - iii) An allowance for other fishing-related mortality of 60 tonnes; and
 - iv) A TACC of 1 480 tonnes.
- b) **Agrees** to set a TAC of 1 510 tonnes for KAH 2 and within that TAC set:
 - i) A customary allowance of 255 tonnes;
 - ii) A recreational allowance of 510 tonnes;
 - iii) An allowance for other fishing-related mortality of 35 tonnes; and
 - iv) A TACC of 710 tonnes.
- c) **Agrees** to set a TAC of 960 tonnes for KAH 3 and within that TAC set:
 - i) A customary allowance of 150 tonnes;
 - ii) A recreational allowance of 300 tonnes;
 - iii) An allowance for other fishing-related mortality of 20 tonnes; and
 - iv) A TACC of 490 tonnes.
- d) **Agrees** to set a TAC of 18 tonnes for KAH 4 and within that TAC set:
 - i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.
- e) **Agrees** to set a TAC of 1 210 tonnes for KAH 8 and within that TAC set:
 - i) A customary allowance of 190 tonnes;
 - ii) A recreational allowance of 380 tonnes;

- iii) An allowance for other fishing-related mortality of 5 tonnes; and
 - iv) A TACC of 635 tonnes.
- f) **Agrees** to set a TAC of 18 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.
- g) **Agrees** to set an annual deemed value for kahawai of:

EITHER

 - i) \$0.32 per kg;

OR

 - ii) \$0.86 per kg.
- h) **Agrees** that differential deemed values apply.
- i) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.
- j) **Notes** that once kahawai becomes subject to the QMS fishing permit conditions applying purse seining catch limits and vessel restrictions on the taking of kahawai will no longer be applicable. Accordingly, the chief executive will need to revoke these fishing permit conditions.

ANNEX ONE

Removing redundant fishing permit conditions

- 67 It is proposed to amend the fishing permits of some permit holders to remove the schedule imposing purse seine catch limits for FMAs 1 and 9 combined, FMA 2 and FMAs 3-8.

Background

- 68 Since 1990-91 commercial catch limits have applied to kahawai, with specific limits pertaining to purse seining. The current purse seine catch limit is 1 200 tonnes for FMA 1 and FMA 9 combined, 851 tonnes for FMA 2, and 1 500 tonnes for FMAs 3-8. These catch limits are fished competitively. MFish monitors catches and closes each fishery if and when it is likely the catch limit has been reached.

Problem definition

- 69 The retention of purse seine catch limits under the QMS does not contribute to the sustainability of the stock, and would result in an unnecessary constraint on harvesting.

Preliminary consultation

- 70 There is a consensus among stakeholders that the long term sustainability of the fishery is the key issue and that management changes are overdue.

Options

Non-regulatory measures

- 71 There are no non-regulatory alternatives to revoking the purse seine catch limits.

Regulatory Measures

- 72 Revoking the fishing permit conditions removes a restriction that is no longer necessary under the QMS.

Costs and benefits of the proposal

- 73 Revoking the fishing permit conditions removes the requirement to enforce purse seine catch limits, and will result in improved harvest efficiency for commercial fishers.
- 74 There are no costs associated with revoking this regulation.

Administrative implications

- 75 There are no administrative implications associated with revoking these fishing permit conditions.

Conclusion

- 76 The retention of purse seine catch limits under the QMS for the kahawai fishery does not contribute to the sustainability of the stock, and unnecessarily restricts the efficient harvest of kahawai. The proposed revocation of the redundant permit conditions will result in benefits, but no costs.

Recommendation

- 77 It is proposed to amend the fishing permits of some permit holders to remove the schedule imposing purse seine catch limits for KAH 1 and 9 combined, FMA 2 and FMA 3.

ANNEX TWO

Species Information

Species biology

- 78 Kahawai (*Arripis trutta*) occurs throughout New Zealand, the Kermadec and Chatham Islands as far south as Foveaux Strait. They are most abundant around the North Island and northern South Island. *A. xylabion* (northern kahawai), although having a longer tail fin, can be difficult to distinguish from *A. trutta*. This species is commonly found at the Kermadec Islands and although rare around mainland New Zealand, is found in northern latitudes. *A. trutta* and *A. xylabion* is included in the QMS as a species assemblage.
- 79 Kahawai live in a variety of habitats, ranging from tidal intrusions into rivers, estuaries and coastal embayments, thought to open waters many miles offshore. Kahawai are most often found in surface schools of similarly sized fish often in association with schools of jack mackerels, blue mackerel and trevally. Schools of kahawai typically contain between 10-40 tonnes of fish.
- 80 Adult kahawai feed mainly on small pelagic fishes such as anchovies, pilchards and yellow-eyed mullet, but also on pelagic crustaceans, especially krill. Benthic species such as crabs and polychaetes are also eaten on occasion, especially during the summer months, when spawning takes place on the sea floor. Juvenile kahawai feed primarily on copepods.
- 81 Biological information suggests no differences in the growth rate, length weight relationship and onset of maturity between the sexes. The onset of maturity occurs at about 40 cm, which equates to ages of three to five years, growth rate is moderate and the maximum-recorded age of kahawai is 26 years. Natural mortality is unlikely to be higher than 0.2 and is likely to be close to this estimate.

Fisheries characteristics

Commercial catch

Catch and landing by QMA

- 82 Reported commercial landing summaries of kahawai for each QMA for the fishing years 1993–94 to 2002–03 are given in Table 3.

Table 3. Reported commercial landings (tonnes) of kahawai by QMA from 1993-94 to 2001-02.

Fishing Year	1	2	3	QMA 4	8	10	Total
1993-94	2 023	706	1 820	0	550	0	5 489
1994-95	1 788	1 063	1 014	0	465	<1	4 483
1995-96	1 570	1 072	1 882	0	452	<1	5 207
1996-97	1 884	1 084	1 391	0	389	0	4 965
1997-98	1 358	191	343	<1	572	0	2 674
1998-99	1 566	729	1 078	0	845	<1	4 468
1999-00	1 602	928	484	<1	725	0	3 921
2000-01	1 592	875	403	0	552	0	3 610
2001-02	1 287	832	152	<1	475	0	2 874

- 83 Between 1970-1975 the annual average commercial catch of kahawai was 500 tonnes, much for use as bait. However, fishing practices evolved to utilise this relatively low value commercial species. Since the mid 1970s purse seine vessels fish for skipjack tuna around the North Island over summer. For approximately five months of the year (December to May) the northern fleet, based in Tauranga, targets skipjack tuna (*Katsuwonus pelamis*). When skipjack is no longer available during the winter and spring months the fleet fish for a mix of species including kahawai, jack mackerels (*Trachurus* spp.), and blue mackerel (*Scomber australasicus*). These species are caught 'on demand' as export orders are received (to reduce product storage costs).
- 84 Reported landings of kahawai progressively increased from 1977 to 1980 stabilising at about 5 000 tonnes between 1980 and 1985 and increasing thereafter to peak at 9 800 tonnes during 1987 to 1988. Commercial landings of kahawai declined between 1988 and 1998. Landings thereafter have stabilised particularly in KAH 1 and KAH 2.
- 85 For the 1990-91 fishing year, the total commercial catch limit for kahawai was set at 6 500 tonnes, with 4 856 tonnes set aside for purse seining. While national catches decreased during 1991-92, landings in KAH 1 increased and for the 1993-94 the competitive catch limits for purse seining in KAH 1 were reduced from 1 666 tonnes to 1 200 tonnes and purse seine catches reported for KAH 9 were included in this catch limit. Since, despite fluctuating between 1993-94 and 2001-02, purse seine landings reported for KAH 1 have averaged 1 200 tonnes.
- 86 No changes have been made to the purse seine limit of 851 tonnes for KAH 2. The KAH 2 purse seine fishery was closed early each year between 1991-92 and 1995-96. Apart from a reduced purse seine catch of 200 tonnes reported for 1997-98, landings have been consistently around 800 tonnes per year.
- 87 The purse seine catch limit for KAH 3 was reduced to 1 500 tonnes from 1995-96. In the past a southern fleet, based in Nelson, fished exclusively for the mackerels and kahawai when fishing in southern waters. With the transfer of some of these vessels to Tauranga the purse seine catch in KAH 3 has declined from landing 1 500 tonnes in 1995-96 to 150 tonnes in 2001-02.

Catch by fishing method

88 Total kahawai catch (tonnes) by main commercial fishing method for all QMAs combined from 1993-94 to 2002-03 is shown in Table 4.

Table 4: Total kahawai landings (tonnes) by main commercial method for all QMAs combined, for fishing years 1992–93 to 2001–02:

Method	Fishing Year								
	1994	1995	1996	1997	1998	1999	2000	2001	2002
Purse seine	4,089	3,423	3,931	3,563	1,530	3,152	2,753	2,590	1,886
Bottom trawl	118	157	289	317	420	622	561	365	348
Set net	412	372	400	704	354	187	192	261	240
Ring net	117	97	86	44	68	80	100	64	139
Bottom pair trawl	26	18	91	5	2	54	54	36	61
Bottom longline	73	106	83	70	54	79	43	64	56
Danish/Beach seine	181	46	12	9	11	19	18	18	6
Trolling	23	47	57	15	3	2	2	5	6
Unknown	59	44	27	22	23	23	15	19	4
Total	5,098	4,310	4,976	4,749	2,465	4,218	3,738	3,422	2,746

Note: Fishing year '1991' is fishing year 1990–91.

89 Over the past nine years, catches by purse seining account for 75% of reported landings. Despite purse seine catch limits, catches by purse seining have fluctuated largely because of variable fishing effort in KAH 3.

90 Trawling, set netting, ring net, bottom pair trawl, longlining, Danish seine/beach seine, and trolling each accounted for lesser amounts.

91 The annual landings of kahawai taken by trawling remained relatively stable with most of the catches in KAH 8. Set net landings have declined, as a result of set net area closures and changes in fishing patterns.

92 Most of the bottom longline kahawai landings are reported from KAH 1. Landings have remained relatively stable through time.

Targeted catch and bycatch

93 Kahawai commercial landings by nominated target species for all QMAs combined in fishing years 1993-94 to 2001-02 are provided in Table 5

Table 5: Total kahawai landings (tonnes) by nominated target species for all QMAs combined, for fishing years 1992–93 to 2001–02:

Method	Fishing year								
	1994	1995	1996	1997	1998	1999	2000	2001	2002
Kahawai	3 389	3 310	3 689	3 322	1 183	2 151	2 446	2 229	1 564
Jack mackerels	1 127	341	474	270	301	667	262	212	376
Trevally	159	215	262	700	482	461	483	332	319
Blue mackerel	0	1	0	20	83	344	120	174	7
Snapper	157	167	245	152	160	269	132	174	169
Grey mullet	94	100	102	83	106	93	113	130	154
Rig	56	54	41	26	23	20	21	26	18
Flatfish	31	28	38	20	50	22	22	23	24
Total	5 098	4 310	4 976	4 749	2 465	4 218	3 738	3 422	2 746

Note: Fishing year '1994' is fishing year 1993–94.

- 94 Most kahawai is taken as a target species almost entirely by purse seining apart from a small amount by setnet. Target fisheries for jack mackerels, trevally, snapper and grey mullet, and occasionally blue mackerel, report bycatches of kahawai.

Number of vessels catching and landing

- 95 The number of vessels reporting landings of kahawai by year is shown in Table 6.

Table 6: Number of landings of kahawai by vessel for fishing years 1993–94 to 2002–03

	Fishing year ^a								
	1994	1995	1996	1997	1998	1999	2000	2001	2002
Vessels	769	729	635	567	518	477	474	497	469

^aFishing year '1993' is fishing year 1993–94

- 96 The number of vessels reporting landings of kahawai decreased between 1993–94 and 1998–99, however since then the number of vessels reporting kahawai has stabilised. The eight purse seine vessels operating in the fishery always take the bulk of the commercial catch.

Recreational catch

- 97 Kahawai is one of the fish species most frequently caught by recreational fishers and the recreational catch estimate is 83% of the average commercial catch during the past five years. The size of the recreational fishery is restricted by the application of daily bag limits but there is no minimum legal size for kahawai.
- 98 A survey of the Value of New Zealand Recreational Fishing undertaken by the South Australian Centre for Economic Studies (SACES) compared kahawai fishers with other recreational fishers. Kahawai anglers are characterised as follows: they go fishing significantly more times per year and are more likely to fish for eating purposes. They are more likely to fish from jetty or land platforms and are slightly more likely to catch and keep additional fish. They have a lower average fishing expenditure, have a higher male participation and are more likely to be a member of a fishing club.
- 99 Obtaining estimates of the total recreational catch of kahawai is difficult. Recreational fishing surveys are designed to estimate the fish caught and killed by

adult anglers. Many children target kahawai and kahawai is commonly used for live baiting when targeting other species. The survey estimates are likely to be an underestimate of the actual level of catch (and hence measure of fish available to the sector and the potential mortality associated with fishing). MFish considers that it is unlikely that survey estimates include all fish caught and landed, used as bait or released by the recreational sector. Since 1991 there have been four telephone and diary surveys conducted to estimate national landings by recreational fishers. Survey estimates for 1992-94, 1996 and 1999-00 are reported below. Preliminary results from the national survey undertaken in 2000-01 have been provided for KAH 2 and KAH 3 as the 1999-00 estimates are likely to be biased by a pool of diarists in those fishstocks that reported fishing much more extensively than any other fishers.

Table 7. Recreational landings of kahawai (number of fish and tonnes greenweight) by QMA for 1991-94, 1996, and 1999-2000.

Year	1991-1994		1996		1999-2000	
	Number	Tonnes	Number	Tonnes	Number	Tonnes
KAH 1	724 000	980	666 000	960	1 860 000	2 195
KAH 2	190 000	290	142 000	217	492 000	800#
KAH 3	223 000	200	222 000	134	353 000	570#
KAH 4	-	-	-	-	-	-
KAH 8	254 000	330*	199 000	204*	337 000	441*
KAH 10	-	-	-	-	-	-

- no estimate

Based on preliminary results from the 2001 national survey

* estimate pertains to FMA 9 only.

- 100 A national survey estimated annual recreational landings of kahawai during the 1991-94 period to be 1 800 tonnes. A national survey conducted in 1996 produced an estimate of 1 515 tonnes that was broadly consistent with the earlier estimate. However, the survey conducted in 1999-2000 produced an estimate of kahawai landings of 2 195 tonnes for KAH 1 (compared to 960 tonnes in 1996). There remains some doubt about the estimates from the 1996 and 1999-00 surveys. The uncertainty revolves around the participation rates of recreational fishers used in each survey. Those for 1999-2000 may be too high and those for 1996 may be too low. Assuming a common participation rate for both surveys will have the effect of lowering the 1999-2000 estimate and increasing the 1996 estimate.
- 101 The average of the two most recent estimates of recreational landings are proposed as the best basis for estimating current recreational utilisation. Because the recreational harvest surveys report on the fishstock codes an arbitrary amount (54 tonnes) was removed from the KAH 3 estimate and added to the KAH 9 estimate to account for area changes in establishing KAH 8.
- 102 Recreational groups have repeatedly expressed concern about the state of kahawai stocks. High percentages of respondents to readership surveys conducted by fishing magazines in 1989, 1990, 1993 and 1997 felt that the numbers of kahawai available to recreational fishers had declined in the years prior to each survey. In 1992 the Recreational Fishing Council (RFC) carried out a club/individual survey where 188 of 189 responses suggested this decline was at least 50%. In 1997 the RFC carried out a survey of recreational fishers in major fishing magazines. There were 2 002 respondents of which 47% felt that kahawai stocks had 'declined significantly' and

32% felt that they had 'declined a little' over the previous five years. Recreational interests have expressed concerns about low kahawai catch rates seen in recreational fisheries. Boat ramp surveys conducted by MFish in 1991 and 1994 indicated that catch rates of kahawai by recreational fishers were <0.2 fish per hour, however, these values included trips targeting other species and therefore may be artificially low.

Customary catch

- 103 No quantitative estimates of customary fishing for kahawai are available. A substantial level of customary catch could be anticipated. Māori have had an historic interest in kahawai and it is an important food source in some localities. The report from the Fisheries Assessment Plenary notes that Māori have concerns with respect to declines in traditional fisheries.

Regulatory Framework

- 104 The recreational daily bag limit for all areas is 20 kahawai per fisher if the one species is taken, otherwise as a mixed bag of 20. The minimum mesh size for recreational set nets targeting kahawai is 100 mm. There is no minimum legal size for kahawai.
- 105 Since 1990-91 commercial catch limits have applied to kahawai, with specific limits pertaining to purse seining. The current purse seine catch limit is 1 200 tonnes for KAH 1 and KAH 9 combined, 851 tonnes for KAH 2, and 1 500 tonnes for KAH 3 (FMAs 3-8). These catch limits are fished competitively. MFish monitors catches and closes each fishery if and when it is likely to be over caught.
- 106 Trawling and Danish seining have been prohibited within two nautical miles of much of the shoreline of the Bay of Plenty, for much of the Hauraki Gulf, and within one nautical mile of much of the north-western coast of the North Island. The reasons for these closures include protecting juvenile fish that often tend to congregate in near-shore waters, and spatially separating commercial trawl and Danish seine vessels and non-commercial fishers.
- 107 MFish notes that there have been voluntary agreements to restrict the commercial take of kahawai.

Fisheries assessment

- 108 A stock reduction model was used in 1996 to obtain estimates of virgin and current biomasses and MCY for a single nationwide kahawai stock with constant recruitment. A single stock was assumed in the absence of information to suggest separate stocks.
- 109 A number of biological assumptions were used in the model and these are provided below in Table 8. The most sensitive input parameter is the natural mortality of kahawai. If the natural mortality of kahawai is assumed to lie between 0.15 and 0.25 the model estimates MCY ranging between 5 100 and 14 200 tonnes (refer Table 9). However, recent analysis suggests the natural mortality for kahawai is unlikely to be higher than 0.2 and is likely to be close to this estimate. MFish considers a natural mortality of 0.2 for kahawai to be the best available information and accordingly proposes that MCY estimates based on that value be considered best available information.

- 110 The coefficients for relations with both sexes combined are given because no significant difference with sex could be detected.

Table 8: Biological parameters used in the model

Parameter	Symbol	Value
Natural mortality	M	0.2 yr ⁻¹
Age of recruitment	A _r	4 yr
Gradual recruitment	S _r	3 yr
Age at maturity	A _m	5 yr
Gradual maturity	S _m	0 yr
Von Bertalanffy parameters	L _∞	60 cm
	K	0.3 yr ⁻¹
	t ₀	0 yr
Length-weight parameters	a	0.024
	B	2.91
Recruitment steepness	h	0.95
Recruitment variability (biomass cal'n)	σ _R	0
Recruitment variability (yield cal'n)	σ _R	0.6

- 111 Catch curves derived for purse seine fishing in KAH 2, KAH 3 and KAH 9 during 1991-92 suggested a maximum value for total mortality of 0.31. Therefore, adjusting the maximum fishing mortality in any year so that the average fishing mortality and natural mortality combined was 0.31 probably made the estimates conservative. The average fishing mortality was calculated over the years 1980-92. As mentioned, recent analysis suggests natural mortality for kahawai is unlikely to be higher than 0.2 and is likely to be close to this estimate. Results of the model for various values of M (natural mortality) are provided below.

Table 9 Estimates (tonnes greenweight) of virgin biomass (B₀) and biomass in 1996 (B₁₉₉₆) compared to B_{MSY}. F_{av} is the average fishing mortality between 1980 and 1992. Estimates are calculated for different values of natural mortality (M).

M	F _{av}	B ₀	B _{MSY} /B ₀	B ₁₉₉₆ /B ₀	MCY
0.25	0.063	152 000	13.9%	71.7%	12 600-14 200
0.20	0.112	106 000	16.1%	50.0%	7 600-8 200
0.15	0.162	93 000	17.8%	28.0%	5 100-5 700

- 112 The above estimates are uncertain and depend on the model assumptions and input data. They may be regarded as conservative estimates as the estimates of total mortality in the model are based on maximum observed values. The catch history is uncertain due to uncertainties in the commercial catch records, and the non-commercial catch history is based on the 1996 survey. Estimates of MCY were calculated for a single national fishstock. MCY = pB₀ where p is determined from a method where the biomass does not go below 20% B₀ more than 20% of the time.
- 113 The base case described for the above parameters provides the basis for the lesser MCY estimate. A sensitivity analysis was undertaken where the non-commercial catch was greater than that based on the 1996 harvest estimate. This has the effect of increasing estimates of B₀, B_{MSY}/B₀, B₁₉₉₆/B₀, and MCY and is the basis for the greater estimate of MCY provided in the range given in Table 9.

- 114 If the natural mortality of kahawai is assumed to lie between 0.15 and 0.25 the model estimates MCY ranging between 5 100 and 14 200 tonnes (refer Table 9). However, recent analysis suggests the natural mortality for kahawai is unlikely to be higher than 0.2 and is likely to be close to this estimate. MFish considers a natural mortality of 0.2 for kahawai to be the best available information and accordingly proposes that MCY estimates based on that value be considered best available information. Accordingly, the best estimate of MCY is between 7 600 and 8 200 tonnes.

Table 10: Summary of yield estimates (tonnes greenweight), average reported commercial landings (tonnes) for 1997–02 and recreational harvest (tonnes greenweight) as estimated by the average of the 1996 and 1999–00 harvest surveys.

Fishstock		FMA	MCY	Commercial landings	Recreational landings
KAH 1	Auckland	1		1 481	1 578
KAH 2	Central (East)	2		711	509
KAH 3	South-East, Southland, Sub-Antarctic, and Challenger	3, 4, 5		492	667
KAH 8	Central (West), Auckland (West)	6 & 7 8 & 9		634	354 323
KAH 10	Kermadec Is	10		0	0
Total			7 600-8 200	3 338	2 762

- 115 Combined estimates of recreational catch and reported commercial landings are currently within the range of MCY estimates.
- 116 There are two species of kahawai present in New Zealand waters, kahawai and northern kahawai. This assessment applies only to kahawai and nothing is known about the other species.

Associated fisheries

- 117 Kahawai swim in schools of similar sized fish and often mix with those of other pelagic species such as jack mackerels (*Trachurus spp.*), trevally, blue mackerel and kingfish. They are associated with pelagic prey species such as juvenile jack mackerels, pilchards, anchovies, sprats, yellow-eyed mullet, whitebait and pelagic crustaceans such as krill.
- 118 Kahawai are themselves preyed by other species such as kingfish, tunas and billfish and might be an important factor in the seasonal availability of these species.

Environmental Issues

- 119 Kahawai, as predators, form an important ecological relationship with its prey, some seabirds, and possibly with some marine mammals. Kahawai circle and herd schools of prey when feeding and in doing so make available the prey species to other predatory species. There is no information on whether current kahawai fishing activities are detrimental to the long-term viability of any other species.
- 120 Juvenile kahawai may suffer from habitat degradation in estuarine areas.

- 121 Within KAH 3 the kahawai purse seine fleet has voluntarily agreed not to fish in a number of nearshore areas around Tasman and Golden Bays, the Marlborough Sounds, Cloudy Bay, and Kaikoura since the 1991-92 fishing year. The main purpose of these agreements is to minimise both local depletion of schools of kahawai found inshore, and catches of juveniles. Similar areas outside KAH 3 have not been identified. There are no other known areas where biodiversity or habitats of significance to fisheries management are likely to be adversely affected by fishing for kahawai.
- 122 Kahawai is taken as a bycatch in trawl fisheries. The nature of trawling is that this method has an affect on the physical structure of the substrate and the benthic community structure. Most of the trawling where kahawai is taken as a bycatch is likely to occur in long-established existing trawl grounds where it is likely the original benthic community will have been modified. MFish does not anticipate that introducing kahawai into the QMS will result in new areas being trawled.

Current and Future Research

- 123 Current research has the objective of monitoring the status of the stock by surveying the length and age structure of the recreational catch over time.
- 124 The direct effects of purse seine fishing for kahawai on the environment has not been studied but are likely to be relatively minor. Research on the interrelationships between kahawai and other elements of the aquatic environment has been identified as an area for future consideration, however, this is a complex area of study and it is unlikely to be undertaken in the foreseeable future.
- 125 As mentioned, obtaining reliable estimates of recreational catch for kahawai has proved difficult. Further work to estimate, and to differentiate, recreational catches and landings are required.

Social, Cultural, and Economic Factors

- 126 The results of the SACES survey produced estimates of the value of the recreational fishery for kahawai based on non-market estimation techniques (contingent valuation to determine the willingness of a fisher to pay to catch a kahawai). These results were used to estimate the value of the recreational fishery based on the 1996 estimate of recreational catch of 1 515 tonnes.
- 127 The results estimate a total recreational expenditure of \$158 million in 1996. It is important to note that total expenditure is not a measure of the net benefit of the fishery and cannot be directly compared to the value of kahawai taken commercially. Also of note is the fact that estimates of expenditure and value are based on what is likely to be an under-estimate of current recreational landings.
- 128 MFish considers that the best comparative measure of recreational value is determined from the marginal willingness to pay (the change in willingness to pay with respect to a unit change in the amount of fish caught and kept). Using the estimates provided by SACES of a marginal willingness to pay of \$2 800 per tonne and capitalising this amount at rates of 5% and 10% provides a range of values from \$28 000 to \$56 000 per tonne.

- 129 Commercially caught kahawai is a relatively low value species although some is sold as a popular smoked product. Port price was \$0.44 per kg greenweight during 2001-02. This price is comparable with that received for QMS species such as blue mackerel (\$0.30) and trevally (\$0.67-\$1.27). In order to determine possible future quota value of kahawai MFish has assessed two comparable QMS species, blue mackerel and trevally. While the fisheries differ in scale and characteristics, the port prices of these three species are comparable. Like kahawai, blue mackerel and trevally are taken by purse seine. Like kahawai some trevally is smoked and both species are popular in this processed form on the domestic market. The average traded price for these species in 2001-02 was \$1 700 and \$5 100 respectively per tonne. These average prices suggest a commercial value for kahawai in the range of \$1 700-\$5 100 per tonne, which is approximately one sixteenth to one eleventh of the estimated value of one tonne of kahawai caught by recreational fishers.
- 130 However, there is considerable uncertainty in information used to assess utility in the absence of a market for tradable rights between sectors. This uncertainty relates to ability to compare non-market values (willingness to pay) with market values (price of quota) and the static nature of the value estimate. The estimate of value is valid only for the time the survey was undertaken. Since that time social, cultural and economic values may have changed.

KAHAWAI (KAH) – FINAL ADVICE

Initial Proposals

- 1 It was proposed to set TACs for kahawai pursuant to section 13 of the 1996 Act. One option was proposed for setting a TAC, allowances and TACC for each stock as shown in Table 1 below.

Table 1: Proposed TACs, TACCs, and allowances for kahawai (tonnes greenweight).

QMA	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
KAH 1	3,910	790	1,580	60	1,480
KAH 2	1,510	255	510	35	710
KAH 3	960	150	300	20	490
KAH 4	18	3	5	0	10
KAH 8	1,210	190	380	5	635
KAH 10	18	3	5	0	10

- 2 An annual deemed value of either \$0.32 or \$0.86 per kilogram was proposed for kahawai.
- 3 It was proposed that differential deemed values apply to kahawai.
- 4 Consequential amendments to the Fisheries (Reporting) Regulations 2001 were proposed.

Submissions

- 5 Submissions on the proposals for kahawai are listed below and are summarised and addressed under the relevant sections of this advice.

- **Akaroa Harbour Recreational Fishing Club Inc**
- **Allan, Alastair D**
- **Anderson, Douglas**
- **Barnett, Jarrod**
- **Bates, David**
- **Bay of Islands Charter Fishing Association**
- **Bay of Plenty Conservation Board**
- **Benfell, V.**
- **Bert Lee (Tolaga Bay East Cape Charters)**
- **Carey, Bruce**

- **Clark, Peter**
- **Coleman, Bruce**
- **Collett, Bruce**
- **Council of Outdoor Recreation Associations of NZ Inc**
- **Craig, Eileen**
- **Crump, Phillip and Betsy**
- **Daniel, Neven**
- **Dennis, John**
- **Dickson, G.M.**
- **Feldman, Mark**
- **Forsman, Steve**
- **Hammond, D.J.**
- **Herbert, John**
- **Hoani Langsbury (Te Runanga o Otakou (Inc))**
- **Horan, John**
- **Jones, Christian**
- **Joyce, Grahame**
- **Kaikoura Boating Club**
- **Larcombe, Myra**
- **Lawrence, George**
- **Mathews, Bill**
- **McKenzie, Weston**
- **McLean, David**
- **Mercury Bay Ocean Sports Club (Inc)**
- **Miller, David**
- **Mount Maunganui Sport Fishing Club**
- **Non-Commercial Fishers (option4, NZ Big Game Fishing Council, NZ Angling and Casting Association)**
- **Northland Conservation Board**
- **NZ Angling Limited**
- **NZ Marine Transport Association**
- **NZ Recreational Fishing Council**
- **O'Connor, Bruce**
- **O'Donoghue, R**

- **Orman, Tony**
- **Potter, Trevor**
- **Richard Pollock (White Island Marine Charters Ltd)**
- **Roberts, Mark**
- **Sanford Limited**
- **Sealord Group Limited**
- **Shanks, Mark**
- **Tangiora, Pauline E.**
- **Tauranga Game Fishing Club**
- **The Northern Inshore Fisheries Company Ltd (NIFCL)**
- **The NZ Seafood Industry Council Ltd (SeaFIC)**
- **Toi, Harry (Nga Hapu, Ngati Kopaki, Ngati TeAra, the Ngati Kopaki, Ngati TeAra Trust)**
- **Tokoroa Sports Fishing Assn (Inc)**
- **Townsend, Murray J**
- **Te Ohu Kai Moana (TOKM)**
- **Treloar, Keven**
- **van Loghem, Philip**
- **Vellenoweth, Jim and Mabel**
- **Waihau Bay Sports Fishing Club Inc**
- **Ward, Michael**
- **Wayne T Taylor (Te Kawanga o Kahungunu)**
- **Whangaroa Big Gamefish Club Inc**
- **Wong, Christopher**
- **Wood, R V**

- 6 MFish notes that the submissions from the Northland Conservation Board, Mount Maunganui Sportfishing Club, Tauranga Game Fishing Club, Tokoroa Sports Fishing Association, and Waihau Bay Sports Fishing Club all state their support for the submission of Non-Commercial Fishers. Accordingly these submissions are considered as part of the submission from Non-Commercial Fishers.
- 7 MFish notes that the submission from the NZ Marine Transport Association states its support for the submission of the Recreational Fishing Council. Accordingly this submission is considered as part of the submission from the RFC.
- 8 Many of the submissions are lengthy and detailed. To ensure that you are able to refer to these directly rather than rely on MFish summaries a bound copy of submissions is available as a supplement to this advice paper.

- 9 1 790 emails were received from the option4 website by 20 June 2004 in response to option4 alert # 6. A subset of 1453 of these responses provided by option4 on 16 May 2004 are evaluated in Appendix 1 and alert # 6 is replicated in full in Appendix 2. Examples of electronic submissions are available for your perusal if you so wish.
- 10 1 668 form petitions were received by 24 June 2004 supporting the option 4 / NZBGFC submissions on kahawai (see Appendix 3).

Key Issues to be considered

- 11 MFish has reconsidered key issues outlined in the IPP that relate to the decisions for setting sustainability measures for kahawai stocks and now consider these to be as follows:
- a) There are two species of kahawai managed as an assemblage in the QMS: kahawai and northern kahawai. Northern kahawai is probably confined to far northern waters and very little information is available for this species;
 - b) Commercial catches have declined after peaking at 9 600 tonnes in 1987-88 reducing to 2 900 tonnes in 2002-03. The majority of commercial landings is taken by purse seining for kahawai, however during the last five years about 45% of the catch is taken as bycatch of other fisheries. The proportion of target and bycatch varies by stock management area;
 - c) Kahawai is one of the fish species most frequently caught by recreational fishers. MFish has now changed estimates of recreational catch proposed in the IPP, which were based on an average of recreational harvest estimates from national diary surveys;
 - d) Technical experts recently reviewed the recreational harvest surveys undertaken in 1996, 1999-00 and 2000-01 and now say that the 1996 estimates should not be used. This group also caution against the use of more recent surveys saying results may be implausibly high for some important fisheries;
 - e) Recent survey results (1999-00 and 2000-01) are substantially higher than those from 1996. Accordingly, MFish now considers that recreational utilisation is greater than portrayed in the IPP;
 - f) Kahawai supports important Māori customary fisheries but the size of the catch is unknown and can only be estimated as a proportion of recreational catch;
 - g) Current estimates of recreational catch exceed that of the commercial sector and when combined with estimates of customary Maori catch the non-commercial fishery is approximately 140% of the size of the commercial fishery;
 - h) Recreational fishers have expressed strong concerns over what they perceive is a marked decline in the amount and size of kahawai available to them in recent years and attribute this decline to commercial fishing and purse seining for kahawai in particular;

- i) Industry submits that there is a lack of information to support any suggestion of a decline in stock size and submit information to support no changes in the number of kahawai schools in recent years;
- j) There is conflicting information making it difficult to confirm either claim. However, clearly there are widespread non-commercial concerns about the fishing down of kahawai stocks. Equally there are commercial concerns about the impact of any reduction in catch to that sector;
- k) Both the recreational sector and some parts of industry support managing kahawai at a level of biomass above B_{MSY} . The current biomass of kahawai is unknown;
- l) A 1996 stock assessment for kahawai is an important reference point but it is dated (trends in biomass since that time are unknown) and there is considerable uncertainty associated with its estimates of yield;
- m) A nationwide combined estimate of recreational catch, customary catch, fishing-related mortality and reported commercial landings now exceeds yield estimates based on the 1996 stock assessment;
- n) There is risk that current catches might be unsustainable in the long term and there are competing demands for the use of kahawai between the fishing sectors;
- o) MFish now proposes two options for setting TACs for kahawai, one based on an estimate of current utilisation and the other based on a reduction from current levels of use; and
- p) Alternative options for setting sustainability measures and other controls for kahawai proposed in submissions are outlined and evaluated in this paper.

Biological and Fishery Information

Submissions

- 12 **Non-Commercial Fishers** submit that the best available estimate of natural mortality is not used in the 1996 stock assessment (refer to the section on the use of the 1996 stock assessment). Other submissions received did not raise any issues concerning the biological information for kahawai provided in the IPP (refer para 78-81).
- 13 Submissions from **Non-Commercial Fishers, TOKM, NIFCL and Sanford** referred to inaccuracies in the catch statistics reported in the IPP and Non-Commercial Fishers submitted that a longer time series of commercial catches should have been reported to indicate past trends in the commercial fishery.

MFish response

- 14 Revised commercial catch statistics have been prepared and these cover a longer time period than that shown in the IPP. These are shown graphically in Figure 1 in the section outlining the trends in utilisation of kahawai.

Environmental Considerations

Submissions

- 15 **Richard Pollock** submits kahawai is an integral food source of a wide range of other carnivorous fish, dolphins and whales.
- 16 **Non-Commercial Fishers** believe that the decline in kahawai abundance is linked to anecdotal accounts of greater numbers of barracouta in northern waters since 1990. The submission quotes a charter boat skipper and ex-commercial fisher who believes that barracouta have extended their temperature preference and range northwards in response to a niche vacancy allowed for by the disappearance of kahawai schools.
- 17 **Non-Commercial Fishers** note that kahawai is one of the few inshore species that push krill and small fish to the surface where seabirds can reach them. While Non-Commercial Fishers states it is not aware of any study conducted to examine the relationship between food availability and nesting success of seabirds it submits that any reduction in the number of kahawai schools has the potential to impact on seabirds, particularly their ability to feed their offspring. Submissions consider that the most notable decline amongst seabirds has been in white fronted terns, which are known as “kahawai birds”. Non-Commercial Fishers submit that MFish have not adequately addressed the effect of declining kahawai stocks on associated and dependent species.
- 18 The **BOPCB** submission refers to a report that concludes that the lack of knowledge about marine species and their role in maintaining the integrity and resilience of marine ecosystems poses a serious risk for New Zealand¹. It submits that kahawai have a unique role to play in terms of biodiversity and the interdependence of a broad range of other species and expresses concern regarding the impact of reduced kahawai stocks.

MFish response

- 19 A number of submitters raise environmental issues that they consider are relevant to the determination of TACs for kahawai stocks. MFish notes that environmental issues and the related statutory considerations are addressed in the IPP at paragraphs 119-122 and paragraph 65 (a)-(g) respectively. In summary, MFish has identified the likely importance of kahawai in the food chain. This is a matter that you can take into account when determining a target biomass for kahawai and the setting of TACs for kahawai stocks.
- 20 In relation to specific submissions, MFish notes that stocks of barracouta and kahawai overlap their distributions throughout most of their respective ranges along the coastlines of both the North and South Island. They have broadly similar niche requirements and are often associated when forming summer feeding aggregations particularly around schools of juvenile jack mackerels or pelagic crustaceans. Tagged barracouta have moved considerable distances (up to 500 nautical miles). It is probably not surprising that at various times particularly when forming these summer

¹ Report of the Parliamentary Commissioner for the Environment, 1999: **Setting Course for a Sustainable Future: The Management of New Zealand's Marine Environment**

feeding aggregations that barracouta are found further north (and kahawai are found further south) than is usual, depending on the movements of their prey. MFish considers this to be a more plausible explanation for the fisher's observations than niche displacement of one exploited stock by another.

- 21 MFish notes that potential effects of reduced kahawai abundance on seabirds were addressed in the IPP at para 119. MFish is aware of one NZ research paper (Robertson 1992) on the effects of food supplies on seabirds. Contrary to the views of submitters, Robertson speculated that reduction of the populations of barracouta, kahawai, gemfish, skipjack and albacore tuna from commercial fishing may have allowed small pelagic species to increase in abundance and which may be contributing to the observed increase in the NZ gannet population during recent decades². While the white fronted tern was once more abundant around the coast, its declining population is believed to be due to predation by stoats, dogs, rats and mustelids. Its accessible nesting habit makes this species particularly vulnerable to disturbance³. International research has concluded that only extreme food shortages cause significant adult bird mortality. However, poor to moderate availability of food can reduce adult body weight, clutch size, breeding success, colony attendance and the growth rates of chicks⁴.
- 22 In summary, the literature suggests that the potential for impacts on other aquatic life is more complex than suggested by submitters. While the potential impacts of sustainable fisheries on seabird populations are likely to be minimal the potentially important role of kahawai in the ecosystem as both a pelagic predator and prey species emphasises the need for caution in management.

TAC

Proposed target level

MFish initial position

- 23 MFish proposed that s 13 management arrangements were appropriate for kahawai. Under s 13 there is a requirement to maintain a fishstock at a target stock level being at, or above, a biomass level that can produce the maximum sustainable yield (B_{MSY}), having regard to the interdependence of stocks.

Submissions

- 24 In general, submitters support the use of the s 13 management arrangements for kahawai stocks.
- 25 However, the submission on behalf of **Non-Commercial Fishers'** considers that the IPP contained no discussion on what kahawai management should aim to achieve. It

² Robertson, D.A. (1992) Diet of the Australasian gannet (*Morus serrator*) around New Zealand **New Zealand Journal of Ecology** 16(2): 77-81

³ Robertson C.J.R. editor (1985) **The Complete Book of New Zealand Birds**.

⁴ Cairns, D. K. (1987) Seabirds as indicators of marine food supplies. **Biological Oceanography**. 5:261-271 and Cairns, D. K. (1992) Bridging the gap between ornithology and fisheries science: use of seabird data in stock assessment models **The Condor**.94:811-824.

notes that the goal of the MFish Strategic Plan 2003 – 2008 is: “*Maximise the value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment*”. It submits that the objective should be to maximise the benefits of this fishery for all New Zealanders. Non-Commercial Fishers also say that MFish must address the 1989 recreational fishing policy objectives in the final advice.

- 26 Further, the submission notes that the IPP claims an overall objective to ensure sustainable management of kahawai. It notes that the Plenary Report infers an acceptable sustainable kahawai stock of about 20% of virgin biomass. Non-Commercial Fishers submit that while this stock size may meet the criteria for maximising commercial harvest it is totally unacceptable to the submitters who require greater consideration of the social, economic, cultural and ecological implications of a kahawai stock reduced to being no more abundant than one fifth of its virgin biomass.
- 27 The submission notes the lack of harvest strategy for kahawai. It notes the adoption of a harvest strategy above B_{MSY} for kingfish and notes that this particular harvest strategy was not widely discussed or agreed to. It submits that the same mistakes are being made for kahawai as management decisions are being taken in the absence of agreed objectives.
- 28 The **RFC** submits that the kahawai fishery should be managed at a biomass greater than B_{MSY} .
- 29 **BOPCB** and many other recreational submissions submit their concerns relating to the fishing down of kahawai stocks. The BOPCB submits that experience available within the board suggests that kahawai biomass has reduced down to 25% of the stock size in 1962.
- 30 **Sanford** notes that there is information suggesting biomass in the mid-1990s was around 50% of virgin biomass (B_0), indicating a healthy kahawai resource at that time. It submits that reducing commercial landings since 1996 has probably led to an increase in biomass since that time.

MFish response

- 31 The management arrangements proposed for kahawai under s 13 of the Act provide for maintaining the biomass of a fishstock at a target stock level, being at, or above, a level that can produce the maximum sustainable yield (MSY), having regard to the interdependence of stocks. MSY is defined, in relation to any fishstock, as being the greatest yield that can be achieved over time while maintaining the stock’s productive capacity, having regard to the population dynamics of the stock and any environmental factors that influence the stock. A requirement to maintain stocks at or above B_{MSY} is generally recognised internationally as being an appropriate fishstock target although there is some international support for B_{MSY} representing a minimum fishstock threshold level.
- 32 The IPP proposals were based on the assumption that kahawai stocks are currently at or above B_{MSY} .

- 33 MFish notes that you have discretion under the Act to manage (and set a specific target level for) a stock at or above B_{MSY} (s 13(2)(a)). If a stock is currently below the target stock level, there is a requirement pursuant to s 13(2)(b) to set a TAC that will result in the stock being restored to the target stock level (that is, at or above a B_{MSY}) in a way and at a rate which has regard to the interdependence of stocks and within a period appropriate to the stock, having regard to the stock's biological characteristics and any environmental conditions affecting the stock.
- 34 If the stock is above the target stock level, there is a requirement to set a TAC that will result in the stock moving towards the target stock level, or alternatively remain above the target stock level, having regard to the interdependence of stocks (s 13(2)(c)). In considering the way in which, and rate at which, a stock is altered to achieve the target stock level, the Minister is to have regard to such social, cultural, and economic factors as he or she considers relevant (s 13(3)). Section 13(3) makes it explicit that such factors are relevant in the determination of the way and rate of progress to the target level, rather than in the determination of the target stock level itself.
- 35 There is no set rate, or time frame, within which a rebuild or a "fishing down" of a stock must be achieved. However, the progress of moving towards the target stock level must be suitable to the fishery in question, having also considered those matters specified in s 13 of the Act.
- 36 MFish notes that rebuilding or maintaining an important recreational fishery at levels above B_{MSY} will theoretically provide benefits to recreational fishers in terms of increased abundance of the stock and hence increased availability to recreational fishers. Further a greater range of size classes will be available in the fishery improving the opportunities for recreational fishers to catch larger fish. MFish assumes that these benefits would also apply to customary fishers.
- 37 The benefits to the commercial sector from management above B_{MSY} are less apparent. There is some reduction in available yield at higher levels of biomass but the commercial fishery could also benefit from improved availability of the stock(s) and the associated lower costs of harvesting in target fisheries. There are, however, costs associated with any reduction in catches that may be required to achieve a higher level of biomass.
- 38 MFish notes that environmental considerations also indicate that maintaining a higher biomass level for kahawai may also be desirable. However, in the case of kahawai there is no recent information on biomass nor is there sufficient information to identify a specific proposed stock level. In this case MFish is not able to provide quantitative estimates for any stock and management above B_{MSY} becomes a largely theoretical exercise. In the absence of this information MFish considers that a target level for kahawai stocks is not a crucial issue to determine at this time. Rather, you should consider the socio-economic benefits at various stock sizes in relation to the TAC options proposed for consideration.

Information used to calculate TACs

MFish initial position

- 39 MFish proposed that TACs be based on estimates of current utilisation. Although available and relevant, the 1996 stock assessment information for kahawai was considered to be uncertain and dated.
- 40 TACs for kahawai stocks proposed in the IPP are shown in Table 2. It was noted in the IPP that the total of all TACs combined was at about the same level as a conservative (base case) estimate of sustainable yield reported in the Stock Assessment Plenary Report.

Table 2: TACs for kahawai stocks proposed in the IPP.

QMA	1	2	3	4	8	10	Total
	3,910	1,510	960	18	1,210	18	7,626

Submissions

- 41 Submissions have raised issues about the information that should be used for the purposes of establishing TACs for kahawai.
- 42 These issues are addressed in the following sections;
- a) Use of the 1996 stock assessment;
 - b) Other sources of information;
 - c) Trends in utilisation;
 - d) Estimates of commercial landings;
 - e) Estimates of recreational landings; and
 - f) Estimates of customary landings.

Use of the 1996 stock assessment

MFish initial position

- 43 The MFish initial view of the 1996 stock assessment was summarised in the IPP at paragraphs 116-124. In summary, a 1996 stock reduction model was used to obtain estimates of virgin and current biomasses and maximum constant yield (MCY) for a single nationwide kahawai stock. Recruitment was assumed to be deterministic for biomass estimation, but stochastic for yield estimation. Estimates of MCY were calculated for a single national fishstock using a model constrained to ensure that the biomass did not go below 20% of the unfished (or virgin) biomass (B_0) more than 10% of the time.
- 44 In the absence of information specific to kahawai, a number of parameter values used in the model were assumed or input as ranges. The natural mortality was one such parameter. In the IPP MFish proposed that a natural mortality of 0.2 for kahawai was the best available information and accordingly proposed that the historic MCY

estimates based on that value were the best available. This was because analysis suggested the natural mortality for kahawai is unlikely to be higher than 0.2 and is likely to be close to this estimate.

- 45 Estimates of MCY derived from the 1996 model were generally regarded as conservative because some of the other parameters used as model inputs were based on maximum observed values. However, in the IPP MFish noted that the historic stock assessment contains important uncertainties, most notably the value used to reflect fishing mortality and the non-commercial catch history applied to the model.
- 46 A base case model using a 1996 estimate of recreational catch provided an MCY estimate of 7,600 tonnes (MCY_{base case}). Using different assumptions concerning the pattern and history of non-commercial catches of kahawai, a sensitivity analysis was undertaken where the non-commercial catch was extended back in time and was greater between 1945 and 1992 than the recreational catch used in the base case. This had the effect of increasing estimates of B_0 , and MCY and was the basis for the greater MCY estimate of 8,200 tonnes (MCY_{sensitivity analysis}).
- 47 MFish noted in the IPP at paragraph 24 that combined estimates of non-commercial and commercial utilisation for kahawai stocks were just within the estimates for MCY (7 600 and 8 200 tonnes) based on a natural mortality (M) of 0.2. MFish proposed setting combined TACs for fishstocks that coincidentally were consistent with the smaller of the two 1996 estimates of sustainable yield (ie 7 600 tonnes). The estimated levels of utilisation for all sectors combined could be accommodated within the proposed TACs and MFish therefore suggested there was no scarcity within the fishery and therefore no clear-cut requirement to consider reducing the current catch in the fishery. MFish noted that the initial proposals were based on the assumption that the stock is at or above B_{MSY}

Submissions

- 48 **Sanford** submits that the methodology proposed for setting TACs for kahawai in the IPP is flawed and fails to properly apply the provisions of the Act. It submits that TACs should be based on the use of best available information. It submits that the 1996 stock assessment is better information as it is based on an evaluation of the sustainability of the resource. Accordingly, Sanford proposes that TACs are set on the basis of the alternative MCY (8 200 tonnes).
- 49 Sanford notes that the stock assessment estimated that biomass in the mid-1990s was around 50% of virgin biomass (B_0), well above B_{MSY} (the biomass that provides the maximum sustainable yield), indicating a healthy kahawai resource at that time. It notes that the IPP conservatively estimated MCY to range between 7 600 and 8 200 tonnes.
- 50 It submits that the stock assessment, completed almost 20 years after the commencement of the kahawai purse seine fishery, indicated that the stock was being fished at conservative levels. Sanford notes that commercial catches over the decade leading up to the assessment averaged around 6 000 tonnes, while catches in the last decade have averaged less than 4 500 tonnes. It believes that the 1996 stock assessment remains the best available information and should be used as the basis for

setting TACs. It submits support for combined TACs based on 8,200 tonnes on the basis that $MCY_{\text{sensitivity analysis}}$ was considered to be conservative.

- 51 **Non-Commercial Fishers** submit that it is not convinced that the critical values used in the 1996 stock assessment are correct. It submits that any TACs set should be based on the use of the best available information (for estimating MCY) and submits that this fishery should be managed above the biomass that will support maximum sustainable yield.
- 52 Non-Commercial Fishers note that the IPP preference is for the $MCY_{\text{base case}}$ of 7 600 tonnes. Further, the submission notes that $MCY_{\text{base case}}$ is based on a natural mortality of 0.20 and a model that allows fishing stocks down to a level of biomass that is less than 20% of virgin biomass. It submits that TACs should be set on the basis of the best available estimate of natural mortality, which it considers to be 0.18, and in addition must set out to manage this fishery above the biomass that will support MSY. It submits that recalculating MCY on the basis of $M = 0.18$ will achieve this. Non-Commercial Fishers submitted a revised estimate of MCY of 6 900 tonnes and recommended combined TACs for all fishstocks be based on this estimate.
- 53 **The RFC** submits that it does not consider that a reliable stock assessment can be carried out without a recruitment index for the fishery.

MFish response

- 54 MFish notes that both commercial and some recreational submissions support the use of the 1996 MCY estimates as a basis for setting TACs. However, submitters differ on which of the MCY estimate should be used. Sanford supports combined TACs for all fishstocks of 8 200 tonnes on the basis that $MCY_{\text{sensitivity analysis}}$ estimates were considered to be conservative and constitute the best available information. Non-Commercial Fishers recommend combined TACs for all fishstocks of 6 900 tonnes based on “revising” the $MCY_{\text{base case}}$ estimate using their preferred estimate of natural mortality ($M=0.18$), which they believe to be a key parameter in the model.
- 55 The historic stock assessment model used to estimate $MCY_{\text{base case}}$ was based on 1996 recreational harvest. Expert advice is now that the 1996 estimates of recreational catch are unreliable and should not be used. This is because of methodological problems with the 1996 survey.
- 56 It is possible that the 1996 survey under-estimated recreational catch but this is not certain. If this were the case then the effect on MCY estimates would be to increase them. This is demonstrated by the value of $MCY_{\text{sensitivity analysis}}$ (8 200 tonnes), which was determined from the model using higher values of recreational catch than those used in the base case model.
- 57 On the other hand, MFish notes that adoption of the Non-Commercial Fishers suggestion of using $M=0.18$ would alter the $M=0.2$ estimate of $MCY_{\text{sensitivity analysis}}$ (8 200) down to approximately 7 600. For $MCY_{\text{base case}}$ the reduction using $M=0.18$ would be from 7 600 down to approximately 6 600⁵.

⁵ These values were calculated by fitting an exponential regression to the three data points in Table 9 of the IPP and then utilising $x=0.18$ in the regression equation. This method is only an approximation.

- 58 MFish accepts that $M=0.18$ may be a more appropriate value for kahawai and notes that while it was not used in the historic assessment model (a range of values was used instead) it is reported in the Stock Assessment Plenary Report as the applicable value for kahawai. However, MFish notes that if the 1996 recreational catch was under-estimated, this counter balances the altered parameter for natural mortality to a degree. The effect of an *ad hoc* revision of the two parameters in response to stakeholder submissions leads MFish to conclude that a conservative estimate of MCY remains approximately 7 600 tonnes.
- 59 The simplistic historic assessment remains a reference point for a level of yield from the kahawai fishery. However, you should note that there is considerable uncertainty associated with the historic stock assessment and the resulting MCY estimates. It is also important to note that MCY will only maintain the stock at or above B_{MSY} if it is at or near this level already. If it is substantially lower then lower catch levels may be required to rebuild the stock.
- 60 MFish agrees with the RFC submission that recruitment variability is a potentially important factor that is poorly known. The 1996 assessment ran a broad range of recruitment sensitivities and selected 0.6 as a conservative value (high variability resulting in lower MCY estimates). The 1996 assessment report noted that recruitment variability may be high for kahawai and the establishment of a recruitment index would give one means of improving the biomass estimates. Attempts to establish a recruitment index for kahawai to date have not been successful.
- 61 As noted in this paper and in the IPP, there is considerable uncertainty regarding the historic assessment, which is now six years out of date. A new assessment of the kahawai stock is required.
- 62 The historic assessment utilised a basic modelling approach and did not incorporate any abundance index. New information is available that would allow further evaluation of critical parameters incorporated in the historic assessment (e.g. revised catch histories and revised estimates of natural mortality). Tag data available at the time of the historic assessment could not be incorporated into that assessment.
- 63 Additional research has occurred since the historic assessment providing additional information that could be incorporated into a new assessment approach (e.g. catch-at-age sampling). Research is currently underway investigating one relative index of kahawai abundance and an index of recruitment (refer RFC submission). Additional research is soon to be contracted to investigate another relative index of kahawai abundance.
- 64 New assessment methods are available that can better utilise all of the available data, whether a relative index or indices are successfully developed or not, and a new assessment is therefore to be proposed for the 2005-06 year (with the historic approach repeated for comparative purposes only). Information from this assessment should be available for reviewing management arrangements for the 2006-07 fishing year.

Other sources of information

- 65 Other sources of information raised in submissions as a means of inferring trends in kahawai abundance and a discussion of these issues is provided in Appendix 1.
- 66 In summary, recreational fishers have expressed strong concerns over what they perceive is a marked decline in the amount of kahawai available to them in recent years. A considerable volume of submissions supports this perception. Reference is made in submission to perception surveys, fishing competition records, tagging analysis, length based studies and recreational CPUE supporting this view.
- 67 Industry suggests that there is a lack of information to support any suggestion of a decline in stock size and refers to aerial sightings, trends in commercial bycatch and recreational sampling information in support of this view. There is conflicting information making it difficult to confirm either claim.
- 68 None of the other sources of information presented in Appendix 1 is definitive with regard to determining recent trends in the stock and the current state of the kahawai biomass. Recreational submissions acknowledge that perceptions about stock status vary by area, other information is limited in extent and usefulness as an index of abundance.
- 69 The limited scientific evidence available does not suggest that there have been major changes in recreational catch rates or reductions in the size of kahawai available to recreational anglers. Recent recreational harvest survey estimates are now considered the best available information on recreational catch. The current estimate of 4 025 tonnes of kahawai (higher than the commercial catch) does not in itself support the widespread perception of respondents that the fishery has declined in availability.
- 70 Equally there is only limited information to support the case that there has been no further decline in the kahawai stock. While perceptions of fishers may be considered to have a lesser weighting than the limited scientific information available they also constitute information. MFish does not discount anecdote but considers that you should weight it accordingly.
- 71 MFish notes the Sanford submission that it is axiomatic that harvesting will have led to a reduction in biomass. With a species such as kahawai that is highly visible because of its surface habit, it will be more noticeable to recreational fishers as the size of the stock is reduced towards B_{MSY} . Further, a reduction in the size of fish might be expected as larger older fish are removed during harvesting and replaced by smaller more productive fish. At issue is whether the biomass has declined to a point that a rebuild of the stock is necessary or desirable.

Estimates of commercial landings

MFish initial position

- 72 MFish's initial proposals were to average five years of commercial landings for the period 1997-98 to 2001-02 to define the commercial landings for the purpose of setting TACs.

Submissions

- 73 **Sanford** considers that the use of an arbitrary time period for assessing current utilisation and setting TACs is inappropriate where a stock assessment is available, and where commercial catches have been constrained by catch restrictions.
- 74 Other submissions specify alternative options for calculating commercial landings for the purpose of setting TACs or in some cases for allocation:
- a) excluding target purse seine landings and basing current utilisation on bycatch levels only (**RFC** and **Mark Feldman**);
 - b) use of “revised” $MCY_{base\ case}$ after making non-commercial allowances (**Non-Commercial Fishers**);
 - c) use of $MCY_{sensitivity\ analysis}$ after making non-commercial allowances, allocated between quota management areas on the basis of the 1993-00 catch history (**Sanford**);
 - d) Use of the average of five years of commercial landings between 1997-02 (**TNFCL**); and
 - e) Use of the average of five years of commercial landings between 1992-97 (**TOKM**).

MFish response

- 75 MFish confirms its initial view that using the most recent five years of commercial landings best reflects public policy considerations and other management measures already in place for the fishery. These considerations are reflected in current management arrangements and consequently the current use of the resource. Complete information is now available for the 2002-03 fishing year and MFish has incorporated this most recent year in determining average landings. This means that current commercial utilisation is defined by the average of the 1998-03 fishing years as compared to the use of the 1997-02 fishing years used in the IPP.
- 76 The information about the catch of each sector group also acts as a guide to the subsequent allocation of the TAC but current use need not determine allocations within a TAC. The Minister makes a separate decision about allocation after setting the TAC.
- 77 The choice of commercial fishing years, intended to reflect current use in the fishery is an important consideration for two reasons. Firstly, within current proposals it determines the level of current use, which combined with that of other sectors, is assessed against sustainability considerations when determining TACs for the fishery. Secondly, the choice of years may affect the allocation of TACs and TACCs between stocks.
- 78 For example the change to include the 2002-03 year within the five-year average has the effect of reducing the average commercial catch for KAH 1 by 125 tonnes despite increasing the average for all kahawai stocks combined by 55 tonnes.
- 79 A more significant trend in the use of more recent commercial landings is the decline in landings in KAH 3 from the period 1993-94 to 1996-97 when compared to the period 1997-98 to 2002-03 (1998-99 is an exception). This change occurred because

of a decline in the level of purse seining in the area of the stock. The use of a more recent period of commercial catch (as opposed to the 1991-97 period proposed by TOKM) results in lower TACs and TACCs for this kahawai stock. You should note the implications of the choice of recent years for determining commercial utilisation of kahawai.

Estimates of recreational landings

MFish initial position

- 80 MFish's initial TAC proposals used an estimate of recreational landings based on an average (with some adjustment) of the 1996 and 1999-00 recreational diary surveys.

Submissions

- 81 Submissions specified the following alternatives:
- a) 1999-00 recreational survey only (**Non-Commercial Fishers**); and
 - b) 1996 diary survey only based on this being the only accepted estimate (**Sanford**).
- 82 Recreational fishers say that their landings have declined but argue that the 1999-00 recreational harvest survey should be used to define their utilisation.
- 83 **NIFCL** recognises the inherent problems with the recreational diary surveys and believes that any advice over the robustness and acceptance of the presumed recreational catch should be qualified.
- 84 **TOKM** accept the estimate of recreational use proposed in the IPP suggesting changes only to estimates of commercial use.

MFish response

- 85 Estimates for the recreational catch of kahawai have been derived from regional telephone/diary surveys conducted from 1991-92 to 1993-94, and three national telephone diary surveys undertaken in 1996⁶, 1999-00⁷ and 2000-01⁸.
- 86 The most relevant surveys are the three national telephone diary surveys. The results of these surveys are summarised in Table 3. The harvest estimates for 2000-01 are preliminary.
- 87 The 1999-00 survey for all fishstocks produced harvest estimates that were considerably greater (up to 300%) than the 1996 survey. Although the general methodology of using a telephone/diary survey was the same for all surveys, there were important differences in the details that could have accounted for the differences between estimates. An independent review advised caution in using the 1996

⁶ Bradford, E. (1998) Harvest estimates from the 1996 national recreational surveys. **Fisheries Assessment Research Document 98/16**.

⁷ Boyd, R.O., Reilly, J.L. (2004) 1999/2000 National Marine Recreational Research Survey: harvest estimates. **Draft New Zealand Fisheries Assessment Report 2004/ April 2004**.

⁸ Boyd, R.O., Gowing, L., Reilly, J.L. (2004) 2000/2001 national marine recreational research survey: diary results and harvest estimates. **Draft New Zealand Fisheries Assessment Report 2004/ May 2004**.

estimates as absolute harvest estimates without further analysis and also cautioned against the use of the estimates for QMA2 for the 1999-00 survey. These considerations lead MFish to conclude that the recreational use of kahawai lay in a range between 1996 estimates and 1999-00 and an average of the two was the best reflection of current recreational utilisation.

- 88 In determining an average between surveys to represent current recreational utilisation an adjustment of survey results was required to take into account specific new stock boundaries for kahawai. Catch estimates for KAH 2 and KAH 3 for 1999-00 were considered to be too high and were replaced by provisional estimates from the 2000-01 survey for this stock.
- 89 A meeting in December 2003 of technical members of the Recreational Working Group examined the methodologies used for each of the 1996, 1999-00 and 2000-01 surveys. The Recreational Working Group considered that the 1996 results should not be used as absolute estimates of recreational catch. Overall the estimates for 1996 were considered at that time to be substantially under-estimated. More recently the 1996 estimates are reported as containing methodological errors and they are considered to be unreliable. Given the size of the more recent estimates of recreational catch MFish considers that it is possible that 1996 estimates of recreational catch remain under-estimates.
- 90 More recent advice from the technical members of the Recreational Working Group is that the estimates of recreational catch from the 1999-00 and the 2000-01 surveys may be implausibly high for some important fisheries and have cautioned against their use.
- 91 MFish considers that the 1999-00 estimates of catch for KAH2 and KAH 3 are implausibly high and this is reflected in the approach adopted in the IPP to exclude these estimates from the average figures presented in the IPP and to use instead provisional estimates from 2000-01. This conclusion was based on a comparison between surveys and between estimates for each stock. For example it was not considered to be realistic that the 1999-00 estimates of recreational kahawai catch for KAH 2 exceeded those for KAH 1 (refer Table 3). The recreational fishery in KAH 1 is generally considered to be much larger than any other area of the country.
- 92 For other stocks MFish notes that 1999-00 and 2000-01 estimates are substantially higher than those for 1996 but is not able to say that they are implausibly high. Given the technical concerns relating to the 1996 recreational harvest estimates and the absence of a current assessment model there are no other reference points for kahawai.
- 93 The recreational fishery for kahawai is either a target troll or lure fishery (based on surface or spatial aggregations of fish) or is taken as a bycatch of fishing using baited hooks. MFish notes that the 2000-01 harvest survey reported kahawai was the second most harvested finfish nationally and the SACEs survey reported that kahawai was the second most important of the five key recreational species it evaluated by value. It is possible that large catches could be realised by recreational fishers target fishing for kahawai. Further, the high recreational catch (estimates now exceed the commercial catch) may explain in part the recreational perceptions that stocks of kahawai have continued to decline in abundance despite the constraint on commercial catches.

- 94 However, to take account of the views of the technical members of the Recreational Working Group, MFish now proposes taking the lower of the 1999-00 and 2000-01 estimates for each kahawai stock as a basis for determining current recreational use for that stock and nationally.
- 95 Table 3 shows the recreational allowance as proposed in the IPP compared with the equivalent estimates of the recreational harvest for each QMA for the 1996, 1999-00 and 2000-01 surveys. Also shown in the table is the best estimate of current recreational use that MFish is able to construct from these surveys based on advice to date.

Table 3: Comparison of IPP estimate of current recreational use, recent harvest estimates and revised estimates of current recreational use.

Fishstock	IPP estimate of recreational use	1996 (t)	1999-00(t)	2000-01(t)	Revised estimate of recreational use
KAH 1	1,580	960	2,195	2,248	2,195
KAH 2	510	217	2,937 (800#)	799	800
KAH 3	300	137	667 (570#)	570	510*
KAH 4	5	-	-	-	5
KAH 9 (8)	380	203	440	609	500*
KAH 10	5	-	-	-	5
Total	2,780	1,516	6,240 (4,006#)	4,226	4,015

Based on preliminary results from 2000-01 national survey.

* Similar to the IPP, 60 tonnes was removed from the KAH 3 estimate and added to the KAH 9 estimate to account for area changes in establishing KAH 8

- 96 In conclusion, internal and external experts have reviewed the 1996, 1999-00 and 2000-01 recreational surveys. Since the IPP was released the Recreational Working Group has confirmed that the 1996 estimates contain methodological errors and should not be used as absolute estimates of recreational catch. Technical advice is that even the results from the 1999-00 and the 2000-01 surveys should be treated with caution, as some estimates are implausibly high for some important fisheries.
- 97 MFish now proposes basing estimates of recreational current utilisation of kahawai on the lowest of the estimates for each stock from the 1999-00 and 2000-01 surveys as outlined in Table 3. Despite the uncertainty in the recent estimates of recreational catch MFish considers that these constitute the best available information with which to determine the current recreational utilisation of the kahawai fishery and with which to consider an allowance for recreational fishing interests.
- 98 MFish has relied on expert advice from the Recreational Working Group regarding the reliability of survey results when deciding on the best estimates of current recreational use of kahawai. MFish acknowledges that the Pelagic Working Group has not reviewed the alternative estimates presented. This is an issue of particular concern to Sanford, which suggests that the recent estimates should not be used because of this. You should be aware of and take into account this concern when considering the alternative estimates of current recreational utilisation proposed. However, MFish reiterates the current advice that the 1996 recreational survey (the Sanford preferred option) contains methodological errors and the estimates should not be used.

Customary Māori catch

MFish initial position

- 99 The IPP at paragraph 18 proposed 50% of the recreational utilisation as a basis for estimating current customary harvest and setting an allowance for customary Māori fishing.

Submissions

- 100 **Sanford** considers that most fishing by Maori New Zealanders is for recreation or sustenance, except for fishing under a customary permit in relation to these activities, and is therefore not by definition customary fishing. Sanford submits that recreational fishing by Maori is sampled by the recreational fishing surveys and therefore is contained in recreational estimates. Sanford suggests that because the Maori population is only 15% of the New Zealand population, and, if few Maori reside in their tribal rohe, then genuine customary catch is likely to be small compared to the total recreational catch by hundreds of thousands of Maori and non-Maori recreational fishers.
- 101 **TOKM and NIFCL** accepted the estimate of customary Maori use proposed in the IPP proposing changes only to estimates of commercial use.
- 102 **Non-Commercial Fishers** submit that customary Maori harvest should be set at 50% of recreational use but say that it is not sufficient to just make a quantitative allowance for customary fishing. Management measures must be put in place to ensure that Maori are able to take kahawai within their allowance.

MFish response

- 103 In order to assess customary catch for the purpose of TAC setting, policy guidelines were used to determine what might be an appropriate allowance for customary Maori fishing. Maori consider kahawai to be a species of significant importance and in these circumstances guidelines suggest that an allowance in excess of estimated recreational catch is appropriate. Given the size of the estimated recreational catch MFish concluded that an allowance of 50% of this amount should be made. This estimation took into account the factors that could influence customary catch. These include the facts that:
- a) Kahawai are widely distributed in coastal waters, harbours and estuaries;
 - b) Kahawai are known to form seasonal spatial aggregations in some locations and form readily locatable schools in coastal waters;
 - c) Kahawai are accessible to customary fishers from shore and by boat; and
 - d) Kahawai is a preferred species for customary fishers in some areas.
- 104 While this estimate was intended for TAC setting purposes it was also the same level proposed as an allowance for customary fishing within the TAC.
- 105 It is important to note the distinction between allocation and TAC decisions. The MFish policy view is that when making decisions regarding an allowance to any

sector you may take into account factors beyond actual catch. MFish notes that the allowance for customary Maori fishing is not intended to be constraining and should take into account the importance of the resource to that sector which may not be reflected by estimates of actual catch.

- 106 In this case MFish acknowledges that some Maori may chose to fish within recreational rules and their catch may be incorporated within current estimates of recreational harvest. However, MFish considers that there is evidence to support the historical importance of kahawai to Maori and it is likely that catches and catch rates by Maori have been greater because of targeting of this preferred species. The Motu River fishery is an example of a high catch rate seasonal fishery where kahawai were harvested for subsistence purposes.
- 107 New information is now available to suggest that recreational utilisation is larger than previously estimated. The most recent estimates of recreational harvest are now considered by MFish to be the best available to determine current recreational use with the result that increased estimates of use are now proposed for the recreational sector. MFish has re-evaluated the proportion of recreational use that could form an estimate of Maori customary fishing for TAC setting purposes and for the purpose of allowing for the interests of customary Maori fishers. An estimate and allowances based on 25% of the higher estimates of recreational utilisation are now recommended. This has the effect of reducing the estimate of customary Maori use and the Maori customary allowances from that proposed in the IPP by about 30% (refer Table 4).
- 108 It is important to note that this is intended as an estimate of customary use over and above any customary Maori fishing that may be included in recreational harvest estimates. MFish acknowledges that there is no quantitative information to support this estimate and you will need to take this into account when determining TACs and subsequent allowances for customary Maori fishing within those TACs. The level of customary harvest becomes important if you decide to set TACs that reduce existing use in the fishery. As a matter of policy MFish recommends that customary use/allowances are not constrained or reduced in this circumstance and the burden of reduction on commercial and recreational fishers is therefore proportionally higher.

Table 4: Revised and proposed (IPP) estimates of current Maori customary fishing by kahawai stock:

QMA	1	2	3	4#	8	10#	Total
Revised estimate of current Maori customary utilisation	550	205	125	1	125	1	1007
IPP estimate of current Maori customary utilisation	790	255	150	3	190	3	1,401

note nominal estimates/allowances for KAH 4 and KAH 10

Trends in utilisation

MFish initial position

- 109 Fisheries characteristics, commercial catch limits and trends were summarised in the IPP in paragraphs 82-101.

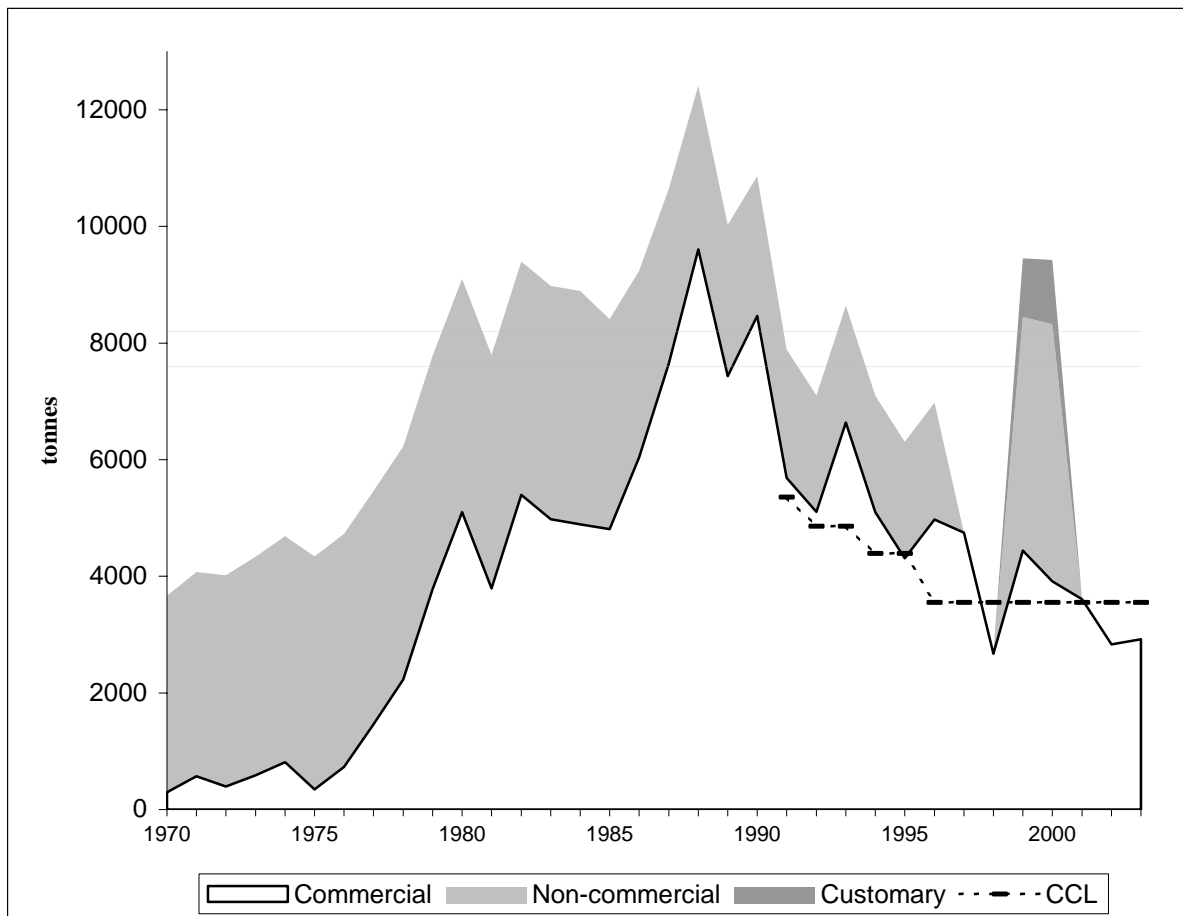
Submissions

- 110 **Non-Commercial Fishers** submit that a more complete description of the commercial catch history is required than is provided in the IPP.
- 111 **Non-Commercial Fishers and Mark Feldman** submits that when quotas were imposed on other species in 1986 companies' diverted fishing effort onto those species not under quota, most notably kahawai. Submissions outline a scenario of largely unrestricted purse seine effort depleting kahawai fishstocks, particularly around the South Island. Further, these and many of the other non-commercial submissions state that the number of kahawai available to recreational fishers and the average size of kahawai have decreased over time. Submissions attribute these declines to purse seining.
- 112 **Non-Commercial Fishers** submit that the public have been concerned about the decline in kahawai since the late 1980s. Non-Commercial fishers acknowledge that a recent report on the size of kahawai taken by recreational anglers has not changed between 1994 and 2003 but say that the intention of the Minister in introducing catch limits for purse seining was to rebuild the fishery and there have been no signs that this has been occurring. Non-Commercial Fishers submit that accepting the dregs of an overheated purse seine fishery that was unconstrained until 1991 is not good enough and will not be accepted by non-commercial fishers, now or in the future.
- 113 **Mark Feldman** submits that the IPP premise of associating declining commercial landings in KAH 3 with reduced purse seining in that area should not be accepted. He submits that it is naïve to believe that commercial fishers would stop fishing in KAH 3 for any other reason than reducing catch rates.
- 114 **Sanford** submits that commercial catches have been heavily constrained since the early 1990s by purse seine catch limits, seasonal restrictions, area exclusions and an agreement to avoid schools of immature kahawai.
- 115 Sanford submits that the decline in commercial landings since 1990 is most apparent in QMAs 3 and 8. It submits that the reduced landings in KAH 3 were due to reduced fishing activity resulting from the imposition of voluntary management measures. These it submits were:
- a) "a voluntary agreement to avoid fishing in southern Tasman Bay because of the importance of the area both to recreational fishers and as a feeding place for small kahawai; and
 - b) a similar voluntary agreement to cease fishing in Cloudy Bay and within one nautical mile of the coast north of Kaikoura. The latter area was an important part of the commercial fishery as kahawai schooled daily in this area as part of a diurnal migration between deep and shallow water, but were usually unavailable in deeper water".
- 116 **Sealord Group Limited** submits that historically it was responsible for the majority of kahawai landings from KAH 3. It submits that landings reduced when the cannery it supplied closed and its purse seine vessel was sold.

MFish response

- 117 Figure 1 shows a representation of combined landings by sector groups over time. The figure is based on reported commercial landings data, recreational harvest estimates up to 1996 are those data reported for the sensitivity analysis version of the 1996 stock assessment and the two point sources graphed for 1999-00 and 2000-01 are based on recreational harvest estimates as reported in table 3. Customary landings are included in the non-commercial estimates until 1996. After that, customary harvest is shown separately based on 25% of the recreational estimates. The combined commercial purse seine catch limits (CCL) are shown. Also depicted are the 1996 estimates of MCY based on a natural mortality of $M=0.2$ (7,600 tonnes and 8,200 tonnes).

Figure 1: Cumulative kahawai landings by fishing sector between 1970-2003



- 118 MFish notes recreational submissions suggesting unsustainable levels of commercial fishing. Figure 1 does suggest the level of commercial fishing alone was in excess of MCY estimates between 1987 and 1991. However, MFish does not share submitters views that management of the kahawai fishery after 1991 was ineffective and that as a result any kahawai stock is depleted due to commercial fishing.
- 119 As shown in Figure 1, the introduction of purse seine limits was effective in limiting commercial catches. The reported number of annual purse seining target sets on kahawai was reduced from about 250 sets in 1987-88 prior to the introduction of catch limits to average about 60 sets after their introduction. Commercial catches have declined after peaking at 9 600 tonnes in 1987-88 to 2 900 tonnes in 2002-03. MFish notes that commercial purse seine catch limits currently apply only to purse seining when kahawai is the target species. Landings in some years in excess of CCLs as shown in Figure 1 are due to landings of kahawai as bycatch.
- 120 Commercial landings from KAH 3 have declined by more than 5 000 tonnes between 1980 and 2003. Most of the early part of this reduction in landings is due to imposing purse seine catch limits, however these have not constrained commercial landings since 1995-96. MFish notes the reasons given for declining commercial landings provided in submissions. Industry submits that profitability of this fishery has been eroded by measures that they have voluntarily agreed to and the closure of a cannery, which have resulted in a changed distribution of the purse seine fleet. Recreational

fishers submit that declining catch rates are a more likely cause of the cessation of purse seine fishing in KAH 3.

- 121 Trends in non-commercial catch, while developed for the 1996 assessment model, are unknown. The two most recent harvest estimates suggest recreational fishers currently account for a much greater component of total landings than the commercial sector. Whether this is the result of a more recent increase in recreational catches or recreational catches of kahawai have been substantially higher than previously thought in the past is unknown. Most recreational submissions claim that recreational catches of kahawai have declined. If this were to be the case then historical catches may have been substantial.
- 122 It is clear that collectively non-commercial catches now contribute significantly to the total mortality on kahawai stocks. Further, revised estimates of current utilisation are beyond the best available estimates of sustainable use of the fishery (7,600 and 8,200 tonnes).

Setting TACs

- 123 MFish proposed in the IPP that kahawai TACs were based on estimates of current utilisation. MFish's estimate of current utilisation for the purpose of setting TACs has been revised from the IPP and is now based as follows:
- a) The lowest estimate of recreational catch from 1999-00 and 2000-01 diary surveys for each stock management area;
 - b) Customary catches based on an altered proportion of estimates of recreational current utilisation (25% as opposed to 50% proposed in the IPP);
 - c) Revised estimates of other sources of fishing related mortality;
 - d) Commercial landings based on the average of landings reported for the five fishing years between 1998-03 (now with commercial landings adjusted by prorating up to catch landed data totals).
- 124 Revised estimates of current utilisation are now greater than the best available estimates of MCY for kahawai (7 600 and 8 200 tonnes). While these estimates are outdated and uncertain they remain the only reference points of sustainable yield for kahawai. Further an "ad hoc" revision of the MCY estimates based on a lower value of natural mortality suggests that they should be lower (although this is counterbalance if past recreational catches has been higher than previously thought).
- 125 There is a risk that current utilisation of kahawai stocks may not be sustainable and there are also widespread perceptions from the recreational fishing sector that a rebuild of kahawai stocks is required. MFish now considers that an alternative option of setting TACs for kahawai below the current level of use should be considered.
- 126 MFish proposes two TAC options for your consideration. The first option is to base TACs on current utilisation and the second option involves a proportional reduction in current commercial and recreational utilisation of 15% for key kahawai fishstocks. The percentage reduction proposed by MFish is arbitrary but is intended to strike a balance between the impacts of any reduction in current use and the increased certainty that the sustainability of kahawai stocks is ensured.

- 127 Alternative options for setting TACs have been suggested by submitters and these are outlined below along with the two MFish options. The options are evaluated as combined TACs as some are presented in submission in this manner with a variety of proposals to apportion these combined TACs between stocks.
- 128 Submissions containing specific information used to support TAC options proposed by stakeholders are addressed in Appendix 1.
- 129 Options identified for setting combined TACs are:
- 9 595 tonnes based on current utilisation using an average of five years between 1992-97 (**TOKM**) apportioned between stocks on the basis of estimates of current utilisation;
 - 8 757 tonnes a status quo option based on the revised estimates of current utilisation presented in this advice. (**MFish current utilisation**) apportioned between stocks on the basis of estimates of current utilisation;
 - 8 200 tonnes on the basis of the $MCY_{\text{sensitivity analysis}}$ estimate (**Sanford**) apportioned between stocks on the basis of the distribution of catches and catch estimates;
 - 7 612 tonnes based on a 15% reduction in commercial and recreational use in key kahawai stocks (KAH 1, KAH 2, KAH 3, and KAH 8) (**MFish proportional reduction**);
 - 6 900 tonnes on the basis of a revised estimate of $MCY_{\text{base case}}$ (**Non-Commercial Fishers**) apportioned between stocks on the basis of the distribution of recreational catch estimates and the level of commercial bycatch; and
 - 6 685 tonnes based on reducing commercial catch to a bycatch level only (**RFC and Mark Feldman**).

Evaluation of TAC options

- 130 TAC options are shown in table 5. While submitters have different proposals for allocation underlying their proposals for combined TACs the setting of allowances and TACCs is a separate decision. In terms of choosing a combined TAC option for kahawai there is a balance between the risk to the stock and the level of impact on current fishers you may wish to impose given the uncertain information on the status of kahawai stocks. Lower TACs represent least risk but also impose a more significant impact on current users of the fishery.

Table 5: TAC (MFish preferred options in bold) options for kahawai stocks:

TAC option and proponent	KAH 1	KAH 2	KAH 3	KAH 4	KAH 8	KAH 10	Total
IPP (not proposed)	3,910	1510	960	18	1210	18	7,625
MFish current utilisation	4,235	1,970	1,190	16	1,330	16	8,757
TOKM	4,600	1,780	1,970	18	1,210	18	9,595
Sanford	3,832	1,635	1,563	16	1,139	16	8,200
MFish proportional reduction	3,685	1,705	1,035	16	1,155	16	7,612
Non-Commercial Fishers	3,452	1,245	987	17	1,193	6	6,900
RFC / Feldman	3,390	1,160	915	16	1,188	16	6,685

- 131 MFish notes the following are relevant factors for evaluating TAC options. There is:
- a) a 1996 stock assessment with estimates of MCY of 7 600 tonnes and 8 200 tonnes;
 - b) the MFish preferred reference point was 7 600 tonnes in the IPP;
 - c) 1996 information on status of stock relative to B_{MSY} (50%);
 - d) considerable uncertainty in the estimates of yield and stock status for kahawai;
 - e) a revised estimate of current utilisation beyond the best available estimates of MCY (7 600 and 8 200 tonnes);
 - f) some agreement by sectors for a target stock level above B_{MSY} ;
 - g) a commercial view that there is no evidence of declining recreational catches, numbers of schools of kahawai or changes in the level of bycatch in recent years;
 - h) a strong recreational perception about declining abundance, availability and size of fish in the main stocks; both long term and in recent years;
 - i) a revised estimate of MCY submitted by Non-Commercial Fishers (6 900 tonnes) as a basis for combined TACs; and
 - j) a revised stock assessment of kahawai is planned but results will not be available for management consideration until the 2006-07 year.

Current utilisation MFish / TNIFCL / TOKM / Sealord

- 132 This option is intended to reflect the status quo management arrangements for kahawai and is based on revised estimates of current customary, recreational and commercial utilisation. MFish notes that the NIFCL supports the basis for assessing current utilisation (using revised values) and assuming that status quo management should continue. TOKM supports the basis for assessing current utilisation but prefers that the criteria years be 1992-97 for most of the fishstocks. Sealord supports the IPP basis for assessing current utilisation for KAH 1, KAH 2 and KAH 8 but submits that for KAH 3 current use should be based on the current CCL (1 500 tonnes).
- 133 Combined TACs for this option total 8 757 tonnes (9 595 for the TOKM proposal and 9 722 tonnes for the Sealord proposal). This level of utilisation is greater than the best available estimates of MCY for kahawai based on the preferred natural mortality parameter (7 600 and 8 200 tonnes). MFish retains its preference for the lower of these two reference points as providing the best balance between the uncertainty in parameters (natural mortality) and inputs (recreational catch) used in the assessment model. While yield estimates are uncertain, as are some estimates of current utilisation (and you need to take this uncertainty into account), there is a level of risk to the sustainability of kahawai stocks if combined TACs are set at this level of utilisation in the fishery. The risk is that kahawai stock sizes will not be maintained at or above B_{MSY} .

Sanford

- 134 Sanford propose that TACs be set on the basis of the 1996 MCY_{sensitivity analysis} estimate (8 200 tonnes) apportioned between stocks. Sanford considers that this yield estimate is conservative and will provide for a level of harvest that will maintain stocks at or above B_{MSY} .
- 135 MFish does not support the use of MCY_{sensitivity analysis} as a conservative estimate of MCY. While it may be a better reflection of yield from the fishery if the pattern of catch used in the model to derive this estimate is correct, the actual trends in catch are not known. The base case MCY estimate remains MFish preferred option as a reference point.
- 136 A TAC of 8 200 tonnes is likely to present less risk to the sustainability of kahawai stocks than one based on current utilisation. It is uncertain, however, whether a reduction to this level will maintain stocks at or above B_{MSY} . It represents only a 567 tonne reduction (6%) from estimates of current utilisation and is 1,395 tonnes less than the TAC proposed by TOKM using alternative commercial catch history years. Adopting this option would give less weight to the anecdotal information of declining stock size, availability and size of fish but would reduce the impact of any reduction on current fishers.

Proportional reduction, MFish

- 137 MFish considers that there is a case for a reduction in current use of kahawai because there is general uncertainty about the state of the stock.
- 138 Anecdotal information from recreational fishers suggests kahawai are less abundant. Anecdotal information is by its nature uncertain. The level of uncertainty should be factored into the weight you place on the information in determining your decision on TAC options. In this case MFish note that while the information is uncertain, the quantity of information from recreational fishers, and consistent concern expressed by submitters about the state of the fishery indicates the general concern recreational fishers have for the state of the stock.
- 139 In addition you should note the potentially important role of kahawai in the ecosystem, which might lead you into emphasising the need for caution in management.
- 140 MFish note that catch sampling and age structure data from the fishery are not providing information to support a recent decline in the size of fish in recreational catches and by implication biomass of the stock. The size and age of the fish sampled has remained relatively constant. However MFish notes that catch selectivity may influence these indicators and they may not reflect trends in stock abundance.
- 141 Estimates of current utilisation are above the best available estimates of sustainable yield (7 600 and 8 200 tonnes). However the 1996 assessment is dated and uncertain. This uncertainty is compounded by potentially counteracting effects of:
- i) information on natural mortality which suggests the estimate used in the assessment might have been too optimistic; and

- ii) new information on recreational catch which suggests that the 1996 recreational catch estimates used in the assessments are unreliable (catch by this sector may be higher than that used in the assessment which would tend to increase MCY estimates but this is not known).
- 142 Nonetheless, MFish consider there is sufficient information (anecdotal information from recreational fishers and stock assessment information) to consider a reduction to current landings. Given the uncertainty in information about stock status and information on sustainable yield MFish considers that a nominal 15% reduction to the level of current removals could be considered.
- 143 MFish note that a 15% reduction of current utilisation (to 7 612 tonnes) would move landings close to the MFish preferred estimate of $MCY_{base\ case}$ (7 600 tonnes) for the fishery. This estimate, although uncertain, provides the best indication of possible sustainable yield for the fishery at this time. MFish note that a further stock assessment using updated information is proposed (although not yet confirmed) for 2005. Information from this assessment, if it goes ahead, would be available for use in considering management options for the 2006-07 fishing year.
- 144 MFish acknowledges that this combined TAC option is based on an arbitrary reduction from current levels of use but considers that a reduction of this amount provides a balance between providing greater certainty that kahawai stocks will be maintained and the level of impact imposed on existing users of the fishery

Non-Commercial Fishers

- 145 Non-Commercial Fishers propose a combined TAC of 6 900 tonnes based on a revised estimate of $MCY_{base\ case}$.
- 146 MFish notes that Non-Commercial Fishers support setting more conservative TACs to allow rebuilding of the stocks. Non-Commercial Fishers submit that recalculating MCY on the basis of $M=0.18$ will achieve this.
- 147 MFish notes that basing TACs on any level of MCY will not necessarily rebuild stocks although the risk of reducing stock size below B_{MSY} is reduced with catch limits based on the more conservative estimates. In addition the Non-Commercial Fishers recalculation of the $MCY_{base\ case}$ ignores the potential counter effect of higher estimates of recreational catch on MCY estimates.
- 148 MFish considers combined TACCs of 6 900 tonnes are more conservative than required for the fishery. There would be socio-economic impacts of adopting this level of fishing. Shared reductions by both the commercial and recreational sectors of around 25% from current levels of utilisation would be required to achieve fishing levels of 6 900 tonnes. MFish considers that on balance, this level of reduction is not required to ensure sustainability but notes that a reduction to this level would provide greater certainty that the kahawai stock would remain at or above B_{MSY} .

RFC / Feldman

- 149 This option is based on reducing commercial catch to a bycatch level only. MFish notes that the focus of this option is on allocating kahawai rather than on proposing sustainable limits on total removals from the fishery. However, by assuming current

levels of utilisation for recreational and customary fishing and by basing the commercial component of TACs on bycatch levels a combined TAC total of 6,685 tonnes is suggested.

- 150 This proposal includes the proposition of removing the purse seine target fishery and discounting past commercial catches by this sector. This proposition is also contained in many email submissions as a result of the Option4 website. This proposal is considered more appropriately under the allocation section of this advice. With regard to the combined TAC level proposed, MFish advice is similar to that provided for the option of Non-Commercial Fishers.
- 151 There would be substantial economic consequences associated with this level of combined TAC. While MFish acknowledges that there would be more certainty that catches were sustainable MFish considers that this needs to be balanced against the level of impact on existing users. It is MFish's view that adopting this option would give undue weight to potential environmental issues and the anecdotal information of declining stock size, availability and size of fish and ignore other indicators that suggest no recent change in kahawai abundance.

MFish preferred TAC options

- 152 The MFish preferred TAC options are to either base combined TACs on current utilisation or an arbitrary 15% reduction in recreational and commercial use of key kahawai stocks (KAH 1, KAH 2; KAH 3 and KAH 8). MFish does not accept the Sanford view that basing TACs on current utilisation is ultra-viries the Act. Nor does MFish agree with the views of some recreational fishers that preferential reductions favouring recreational use should be used as a basis for TAC setting. MFish considers that in the current position of uncertainty it is not appropriate to place undue weight on any one indicator of stock size or abundance. If you consider that current utilisation is at levels that presents a risk to the sustainability of the stock then in these circumstances a reduction in utilisation is indicated.
- 153 MFish considers an alternative option to TACs based on current utilisation is to base them on a proportional reduction in utilisation. A reduction of 15% is significant but it is proposed as a balance between certainty and impact. The following sections on TACs for each stock and subsequent allowances also contains tables of allowances and TACCs for alternative TAC options proposed by stakeholders for your consideration

Option 1 (Current Utilisation)

KAH 1

- 154 A TAC of 4 235 tonnes is proposed (increased from the 3 910 tonnes proposed in the IPP). This is based on estimates of current commercial, customary and recreational utilisation and an allowance for other sources of fishing related mortality.

KAH 2

- 155 A TAC of 1 970 tonnes is proposed (increased from the 1 510 tonnes proposed in the IPP). This is based on estimates of current commercial, customary and recreational utilisation and an allowance for other sources of fishing related mortality

KAH 3

- 156 A TAC of 1 190 tonnes is proposed (increased from the 960 tonnes proposed in the IPP). This is based on estimates of current commercial, customary and recreational utilisation and an allowance for other sources of fishing related mortality

KAH 4

- 157 A TAC of 16 tonnes is proposed for this stock, which is slightly reduced from the 18 tonnes proposed in the IPP. This is because of an estimate of customary utilisation that has been revised from the IPP.

KAH 8

- 158 A TAC of 1 330 tonnes is proposed (slightly reduced from the 1 210 tonnes proposed in the IPP). This is based on estimates of current commercial, customary and recreational utilisation and an allowance for other sources of fishing related mortality

KAH 10

- 159 A TAC of 16 tonnes is proposed for this stock, which is reduced from the 18 tonnes proposed in the IPP. This is because of an estimate of customary utilisation that has been revised from the IPP.

Option 2 (Proportional reduction)

KAH 1

- 160 A TAC of 3 685 tonnes is proposed (reduced from the 3 910 tonnes proposed in the IPP). This is based on a 15% reduction in current commercial and recreational utilisation. .

KAH 2

- 161 A TAC of 1 705 tonnes is proposed (increased from the 1 510 tonnes proposed in the IPP). This is based on a 15% reduction in current commercial and recreational utilisation.

KAH 3

- 162 A TAC of 1 035 tonnes is proposed (slightly increased from the 960 tonnes proposed in the IPP). This is based on a 15% reduction in current commercial and recreational utilisation.

KAH 4

- 163 A TAC of 16 tonnes is proposed for this stock, which is reduced from the 18 tonnes proposed in the IPP.

KAH 8

- 164 A TAC of 1 155 tonnes is proposed (reduced from the 1 210 tonnes proposed in the IPP). This is based on a 15% reduction in current commercial and recreational utilisation.

KAH 10

- 165 A TAC of 16 tonnes is proposed for this stock, which is reduced from the 18 tonnes proposed in the IPP.

Impact of reduced TACs

- 166 If you accept the need for a reduction in the current level of utilisation to achieve levels of kahawai stocks that are sustainable in the long term you are required to have regard to such social, cultural and economic factors as you consider relevant when deciding on the rate at which stocks should rebuild. The interests of future generations are also an important consideration.
- 167 Submissions document how reduced TACs will impact on submitter's respective interests. Notwithstanding these impacts, there is common ground between non-commercial and some commercial sectors in their acceptance of the target levels used as a basis for managing kahawai. Both submitted support for setting TACs on the basis of MCY estimates.
- 168 There are socio-economic impacts of TAC options. The degree of impact in particular will depend on the allocation option you choose. Detailed consideration of economic impact is outlined in the sections on allocation.
- 169 MFish has assumed that the interests of customary Maori fishers are best served by an improvement in the availability of kahawai. MFish has proposed no reduction in allowance for customary Māori fishing under the proportional reduction option (reductions are proposed only for the recreational and commercial sectors) and considers that the benefits, or otherwise, to customary fishers of the TAC option proposed will be an improved ability to take kahawai within their allowance.
- 170 MFish concludes that the ability of Māori customary fishers to harvest kahawai within their customary allowance for the stock will be improved by reducing the landings of the other fishing sectors.
- 171 MFish assumes that the interests and aspirations of future generations of recreational fishers will be similar to those expressed by current fishers. That is access to stocks of kahawai where catches are reasonably available and fish are of good (in a recreational context) size. Recreational dissatisfaction with the current position is clearly apparent and MFish concludes that recreational perceptions will be improved with reduced levels of landings.

- 172 In a more general sense the maintenance of stocks at or above a level that will support B_{MSY} is likely to meet the needs of future generations.
- 173 There will be an impact on recreational landings of reduced TACs. Effective constraint will be required to achieve a reduction in recreational landings. Some submissions support the need for a reduced bag limit or imposition of an MLS (although this might pose problems for fishers wishing to use undersize kahawai for bait). MFish does not know if recreational fishers are prepared to accept this impact in the knowledge that benefits will accrue to them from a greater stock size.
- 174 Commercial fishers perceive no such benefits to offset the impacts of lower commercial landings of kahawai. Clearly there are benefits to industry from constraints on the total removals of kahawai. Submissions have articulated the value of kahawai to the commercial sector as a bycatch and target fishery. Sanford has also indicated that it supports maintaining kahawai biomass above the B_{MSY} . Without management action this value could be potentially dissipated if stocks decline. At issue is whether longer term benefits can accrue to industry from stocks at greater levels of biomass leading to a greater availability of kahawai and who contributes to this rebuild.
- 175 Commercial impacts can be measured as direct opportunity costs. A tonne of kahawai has a value and any reduction in tonnage for the commercial sector as a result of a lower TAC is an opportunity cost. This is particularly the case for target fisheries or where a component of the fishery is based on targeting. For bycatch fisheries additional impacts occur when catches are constrained to such a level that ACE is not available to cover the inevitable bycatch associated with other target fisheries. Impacts include the punitive measures associated with the balancing regime or the potential that bycatch constrains target fisheries and limits the landings of these fisheries. MFish is not aware of any current situations where target catches are constrained by the level of bycatch TACs. Typically landings are taken in excess of the bycatch TAC if this is required and deemed values are paid. There is also the risk that catch in excess of ACE will be discarded at sea.
- 176 Ensuring that quota and/or ACE flows to where it is most required in the fishery on entry to the QMS will be a test for the economic incentives provided in the QMS. At the levels of TAC proposed, the majority of quota will be required to cover unavoidable bycatch in some stocks (eg KAH 8). At the outset MFish relies on the economic incentives and disincentives of the QMS to ensure that landings remain within the TAC (and TACC). Again this is a consideration of both the TAC and allowances that you decide to set.
- 177 You will need to consider the balance of costs and benefits in your decision as to what TACs to set. Of necessity MFish has assumed the status quo distribution of landings when considering a more detailed assessment of possible economic impacts. MFish has considered the socio-economic impacts associated with TACC options later in this paper. The detail of impacts on each sector will vary for each stock. MFish notes that reduced TACs are proposed only for the main areas of fishing (KAH 1, KAH 2, KAH 3 and KAH 8).

ALLOCATION

Introduction

- 178 The Act requires that, when setting a TACC, you must have regard to the TAC for that stock and you must allow for recreational and customary Māori fishing interests and other mortality to the stock caused by fishing. The Act does not provide any explicit criteria to guide determination of the allowances provided to each fishing sector. The nature of your discretion is broad. Subject to the constraints of the scope of the Act, you are able to take into account such factors you consider to be relevant to your decision and determine the weight you consider to be appropriate to be placed on such factors.
- 179 MFish set out a list of factors in the Statutory Considerations and Policy Guidelines section of the IPP that it considers being relevant to your decision. In addition, MFish identified judicial decisions that consider the issue of allocation of the TAC. In particular, case law has identified that:
- a) you need to consider competing demands for a stock;
 - b) you do not need to provide for the needs of any particular sector when specifying an allowance;
 - c) you are able to vary the ratio between commercial and recreational interests; and
 - d) where commercial landings are reduced for sustainability reasons, reasonable steps should be taken to avoid the reduction being rendered futile through increased fishing by non-commercial stakeholders.
- 180 In general, the Act provides no legal recognition of landings taken by a sector prior to introduction to the QMS. Your discretion to determine allocation of the TAC is not fettered by catch histories of any sector.
- 181 In the instance of kahawai there are competing demands for the resource. MFish now recommends a reduction in current utilisation of kahawai. In the IPP, MFish set out two fundamental policy approaches for addressing competing demands. Both approaches are consistent with the Act. The two approaches are:
- a) A claim-based allocation describes a situation where allocations are made on the basis of a consideration of the legitimacy of claims to the resource. Generally these claims are based on some form of present or historical association with the resource, giving rise to expectations on the part of fishers (or classes of fishers) with respect to on-going future involvement; and
 - b) A utility-based allocation describes a situation where allocations are based on the utility (or quantum of well being) that would flow from a particular allocation. This method tends to favour allocations to those who value the resource most (downplaying the importance of past associations with the resource). As such it tends to have a focus on the present rather than the past.
- 182 Information available at the time suggested that current combined levels of utilisation were within the more conservative of the best available MCY estimates. Accordingly

the IPP suggested there was no scarcity in the fishery and therefore no clear-cut requirement to consider reallocating the fishery between sector groups on the basis of utility value or any other consideration. However, that is no longer considered to be the case and if you accept the need for a reduction in the current level of utilisation to achieve levels of kahawai stocks that are sustainable in the long term you will need to consider the implication of making allocations when there are competing demands for the available resource.

- 183 MFish has a policy preference in this circumstance for a claims based allocation and recommends that reductions in recreational and commercial utilisation occur in equal proportions. As matter of policy MFish does not recommend a reduction in the allowance proposed for customary Maori fishing but notes that this allowance is based on an estimate of current customary use that is contested in industry submission.

Utility value of the kahawai fishery

MFish initial position

- 184 The IPP discussed estimating utility value for the kahawai fishery at paragraphs 126-130. It noted that there is a great deal of uncertainty with information used to assess utility value, particularly for the recreational sector where non-market valuation techniques are used. However, recreational estimates of value provided by the South Australian Centre for Economic Studies (SACES)⁹ and a proxy valuation for kahawai to the commercial sector are available.

Stakeholder submissions

- 185 **Sanford** submits that its purse seine fleet operates year-round, fishing a multi-species catch plan of which kahawai contributes from 10-15% by value. These vessels generate annual sales of which \$2.5 million is attributable to kahawai. It submits that a reduction in catch would render one or more of its five domestic purse seine vessels unviable. Sanford lists 104 jobs associated with its purse seining operations.
- 186 Sanford notes that kahawai presents a development opportunity for the seafood industry as greater value markets are being developed. Exports are increasing overseas, particularly in the Middle East and the opening of the Auckland Fish Market this year will result in further increases in domestic sales. The Sanford submission includes a table suggesting a progressively increasing trend in kahawai sales value per kilogram from \$1.08 in 2001-02 to \$1.30 in 2002-03.
- 187 Sanford submits that commercial fishing contributes valuable employment and foreign exchange earnings to the economy, as well as providing safe, healthy seafood for the majority of the New Zealand population who do not fish for sport.
- 188 **SeaFIC** and **TOKM** contest the non-market valuation study used to derive estimates of recreational value (SACES). Both submit that the survey is flawed and has attracted academic criticism in the past.

⁹ The South Australian Centre for Economic Studies (1999) **Value of New Zealand Recreational Fishing Project: REC 9801**.

- 189 **The RFC** notes that the SACES project found that kahawai have a greater value as a recreational fish than as a commercial fish and that kahawai is second only to snapper in terms of overall recreational value. It submits that these results reinforce the value and importance placed on kahawai by the RFC and to the recreational sector.
- 190 **Non-Commercial Fishers** notes that while the commercial value is \$1 700-\$5 100 per tonne (an estimated provided in the IPP) it submits that the value of most purse seine caught fish would be at the lower end of this range. A body of supporting submissions oppose the commercial use of a fishery highly valued by recreational fishers.

MFish response

- 191 While noting the economic importance of kahawai to Sanford and the factors raised regarding the potential for greater value markets for kahawai MFish still considers that the present commercial valuation for kahawai remains within the range of values considered in the IPP.
- 192 MFish notes the criticism raised in submission regarding the SACES survey but considers that much of this has been addressed in the past. Despite the uncertainty in non-market valuation (acknowledged in the IPP) MFish notes that there is considerable disparity between estimates of commercial and non-commercial value (refer IPP paras 126-130).

Allocation principles

Stakeholder submissions

- 193 Industry submissions strongly oppose anything other than a claims based approach to setting allowances and TACCs. Submissions from commercial fishers and their representative organisations may be summarised as follows:
- a) Information on utility was highly uncertain and techniques used to estimate utility flawed;
 - b) Use of utility had the potential to undermine the QMS and the integrity of ITQ; and
 - c) A claims or catch history based allocation framework provides more certainty.
- 194 **TOKM** supports the principle of catch history for allocating catch between sectors and considers that use of utility without compensation could be considered bad faith because it would undermine treaty settlement assets.

- 195 **The Bay of Island Charter Fishing Association** and **Tony Orman** supports managing kahawai as a tourist-recreational fish. Tony Orman submits that kahawai is potentially an economic resource of far greater magnitude than the earnings from purse seining, if designated as a recreation and sports fish. His submission notes that Sanford employ 100 people associated with purse seining but submits that one fishing lodge could generate an equivalent number of jobs with just twelve rooms (using what he states as the accepted factor of 8 jobs per tourist bed per night).
- 196 Other recreational submissions generally refer to the fact that kahawai is highly valued by that sector citing either social or economic values associated with the fishery that they believe outweigh those of the commercial sector.

MFish response

- 197 MFish notes that your discretion in regard to factors you can take into account when determining allocations is wide. These factors are outlined in the generic section of the IPP. The utility concept is one of these relevant factors.
- 198 Most recreational submissions strongly favour preferential access for the recreational sector on the basis that kahawai is more highly valued by them. Much is made in submission of the fact that kahawai caught commercially has a low value. Recreational groups favour a qualitative assessment of utility based on giving a preference to recreational fishers in a fishery that is obviously “more valuable” to them.
- 199 MFish considers that there is subjectivity attached to both consideration of catch history and utility. As evidenced by the discussion on catch history in the earlier sections of this paper, catch history is contentious. MFish considers that much of the critique of the utility model and estimates provided in the IPP can be addressed, however MFish confirms its view (acknowledged in the IPP) that there is a great deal of uncertainty attached to quantitative assessments of value.
- 200 MFish considers that catch history information is a more certain basis for allocation than utility and has a policy preference for its use. Utility information for kahawai is uncertain. You should weight this uncertainty if you consider the use of utility information as a basis for allocations for kahawai.

Māori customary allowance

MFish initial position

- 201 The IPP proposed that in the absence of quantitative information a customary allowance be set at 50% of the current level of recreational utilisation.

Stakeholder submissions

- 202 **Sanford** submits that the Maori customary allowance proposed in the IPP is excessive. Other aspects of its submission on the Maori customary allowance are addressed in the preceding section on Maori customary utilisation.

- 203 **Non Commercial Fishers** submit that a component of customary fishing is contained in recreational harvest estimates but that customary allowances should be based on 50% of the recreational harvest estimates to ensure that Maori have a priority access to kaimoana.
- 204 **Harry Toi** (on behalf of Ngati Hapu, Ngati Kopaki, Ngati Kopaki, Ngati te Ara, the Ngati Kopaki, Ngati TeAra Trust) submits that the allocation process is not conducive to the sustainability of the resource for tangata whenua. He submits support of the need for assessing impacts of the social and economic situation of tangata whenua before allocating quota.
- 205 **Wayne Taylor** (on behalf of Ngāti Kahungunu, Ngāti Pahauwera and Moeangiangi 42 N owners) submits that kahawai has special spiritual, cultural and historical significance for them. Wayne Taylor notes that one of sub tribes of Ngāti Pahauwera was known as the Kahawai tribe and derived a particular spiritual connection to kahawai.
- 206 **Te Runanga o Otakou** notes that the Minister is required to develop policies to help recognise the use and management practices of takatā whenua in the exercise of customary non-commercial fishing rights. Te Rūnanga o Ōtākou requests that a minimum of 25% of the TAC be provided as a non-commercial allowance, of which 80% should be provided as a customary allowance.
- 207 **John Horan** submits that his whanau have coastal land of Maori heritage. He has supplied the elderly and his family for almost twenty years and he states that they rely on kahawai. He wants to continue supplying the needs of his extended family but submits that there has been a decline in kahawai at Whatuwhiwhi over the years that he attributes to commercial fishing.

MFish discussion

- 208 MFish proposes to base Maori customary allowances on revised estimates of current utilisation (refer previous section on customary Maori catch and Table 6).
- 209 It is important to note that this is intended as an estimate of customary use over and above any customary Maori fishing that may be included in recreational harvest estimates. MFish acknowledges that there is no quantitative information to support this estimate and you will need to take this into account when determining allowances for customary Maori fishing within the TACs proposed. The level of customary harvest becomes important if you decide to set TACs that reduce existing use in the fishery.
- 210 MFish notes the submission of Wayne Taylor supporting the fact that kahawai is a species of particular significance to customary Maori fishers and of John Horan articulating the reliance his whānau place on kahawai. As a matter of policy MFish recommends that customary use/allowances are not constrained or reduced in the circumstance of reduced TACs and the burden of reduction on commercial and recreational fishers is therefore proportionally higher.
- 211 MFish notes the generic view of Te Rūnanga o Ōtākou for the provision of allowances, but concludes that a standard approach to setting allowances in the

manner suggested is not appropriate for kahawai. Rather a case-by-case approach is indicated. This submission is addressed in further detail in the generic section of this advice.

Table 6: Options (MFish preferred option in bold) for the allowance for Maori customary fishing by kahawai stock:

QMA	1	2	3	4	8	10	Total
Current utilisation (status quo)	550	205	125	1	125	1	1 007
Current utilisation (proportionally reduced)	550	205	125	1	125	1	1 007
Sanford#							
Non-Commercial Fishers	1 000	375	275	3	200	2	1 855
# see table 7							

Recreational allowance

MFish initial position

- 212 The recreational allowances (in tonnes) proposed in the IPP for each QMA are set out in Table 7 below. The average of the two most recent estimates of recreational landing was proposed as the basis for setting the recreational allowance.

Stakeholder submissions

- 213 The **RFC** submits that no recreational allowances should be set until better information becomes available.
- 214 **Non-Commercial Fishers** propose that the allowances should be based on the results of the most recent survey. Submissions state that an error in the 1996 recreational harvest survey allowed for many refusals in the survey to be counted as non-fishing households. Accordingly, it submits that incorrect harvest estimates must not be used as a basis for how much kahawai is allowed for by recreational fishers.
- 215 Non-Commercial Fishers submits that as a source of food, learning or sport, kahawai are highly valued by recreational fishers. It submits that the fishing experience for kahawai provides a thrill for anglers of all ages.
- 216 **Sanford** also opposes the MFish proposed allowances. Sanford submits that the 1996 survey alone should be used to determine an allowance as the most recent survey has yet to receive full review and acceptance.
- 217 **SeaFIC** and **TOKM** strongly oppose the setting of recreational allowances on the basis of a transfer of value away from the commercial sector.

MFish discussion

- 218 MFish notes that the statutory basis for determining allowances within a TAC is clear. You do not need to provide for the needs of the recreational sector (or any other sector group) in full. You will need to make an assessment as to the competing needs of the sector groups for a limited resource.

- 219 There is no constraint (within the scope of the Act) on the basis upon which you can decide to allocate the TAC or on the quantum you elect to allocate to each sector. As noted previously, it is important for you to have regard to the relevant social, economic and cultural implications when making your decision. MFish considers that landings history information is a more certain basis for allocation than utility. Utility information for kahawai is uncertain. You should weigh this uncertainty when considering the use of utility information as a basis for allocations for kahawai.
- 220 There are competing demands for the use of kahawai. Recreational fishers constitute the largest fishing sector and account for about 60% of all kahawai currently caught. Kahawai is one of the few species that has this characteristic. It is highly sought after by recreational fishers. The saltwater flyfishing industry and some charter operations also have a significant interest in the species. Recreational fishers express a preference for increased abundance and greater ability to catch large sized fish.
- 221 MFish considers it is appropriate that due recognition be given to the importance of the stock to recreational fishers. However, it is problematic to ascertain what the precise needs of recreational fishers are. Recreational landings of 4 025 tonnes per annum are not satisfying current recreational needs as measured by perception surveys. While recognising the recreational importance of kahawai, MFish does not support fully allocating the fishery to recreational fishers or endeavouring to provide for the needs of recreational fishers in full.
- 222 The recreational solution is to remove the purse seine target fishery. There would be substantial economic consequences associated with removing the target component of commercial landings and no legal mechanism for effecting it. MFish considers that the critical decision is the level of TACC you decide after allowing for non-commercial use. MFish considers that industry should be free to operate within that TACC as they see fit (regarding the choice of fishing method).
- 223 MFish recommends that the recreational allowance be based on either the MFish estimate of current recreational utilisation or a 15% reduction of current utilisation depending on which TAC option you elect.

Table 7: Options (MFish preferred options in bold) to set recreational allowances for kahawai fishstocks:

Option and proponent	KAH 1	KAH 2	KAH 3	KAH 4	KAH 8	KAH 10	Total
IPP	1,580	510	300	5	380	5	2,780
Current utilisations	2,195	800	510	5	500	5	4,015
Proportional reduction	1,865	680	435	5	425	5	3,415
Sanford#	1,705	550	324	6	410	6	2,780
Non-Commercial Fishers	2,000	750	550	4	400	3	3,707
RFC*							

Recreational and customary allowance combined

* Wait for better information

Management of recreational landings

MFish initial position

- 224 MFish did not propose introducing any change to management arrangements for recreational kahawai fishing on the basis that the allowance proposed was based on existing use.

Stakeholder submissions

- 225 **TNIFCL** notes trends in population growth and submits that recreational effort should be constrained through reductions in the daily bag limit and setting of a minimum legal size for kahawai.
- 226 The **Bay of Plenty Conservation Board** recommends a halving of the daily recreational allowance of twenty kahawai per person.
- 227 **The RFC** supports the recreational sector assisting with a rebuild of kahawai stocks but only if this was made possible by controls on commercial landings.

MFish discussion

- 228 There is no minimum legal size limit for kahawai taken recreationally and recreational bag limits for kahawai are based on a mixed bag of species with a limit of 20 per person (an exception is the Southern Fishery Management Areas in which an individual daily limit of 15 applies). Within the mixed bag limit, if kahawai is the only species taken, then up to 20 may be taken per person per day.
- 229 Management options are available to constrain recreational kahawai catches. These include the imposition of a minimum legal size (effective for some species) or the setting of a separate and reduced daily bag limit for kahawai. The MFish preference is to consider a reduction in the daily bag limit. MFish has yet to analyse recreational survey information to determine what an appropriate bag limit should be to achieve the desired level of reduction.
- 230 If you agree to set an allowance for recreational fishing less than the current level of use, MFish will provide you with further advise on how this might be achieved following consultation with recreational fishing interests. This is not a decision that needs to take effect at the commencement of the fishing year on 1 October 2004.

TACC

MFish initial position

- 231 TACCs proposed in the IPP for each QMA are set out in Table 8 below.

Stakeholder submissions

- 232 **The Council of Outdoor Recreation Associations of New Zealand Inc** and **New Zealand Angling Limited** submit that kahawai should be designated a recreational fish with no allocation of commercial quota. They submit that only by eliminating commercial fishing will the fishery recover to sustainable levels.
- 233 **Non-Commercial Fishers** and the **RFC** submit that purse seine catch history should be discounted and that the TACCs should be based on reported commercial bycatch only. Non-Commercial Fishers submit that for three of five years the purse seine fleet has exceeded the KAH 1 commercial catch limit of 1 200 tonnes and because this is illegal it should be discounted from the catch history.

- 234 **Mark Feldman** submits that as kahawai are worth a lot more to the recreational sector an effort should be made to define the true commercial bycatch and this should be used to determine TACCs. Mark Feldman is concerned that the IPP recommends an increase in the commercial fishery.
- 235 The **Sanford** submission proposes setting TACs on the basis of MCY_{sensitivity analysis} (8,200 tonnes) and allocating TACCs on the basis of these TACs after making allowances for recreational and customary fishing.
- 236 The **NIFCL**, **SeaFIC**, **TOKM** and **Sealord** support basing TACCs on estimates of current commercial utilisation but differ in their proposals for defining what current utilisation is.

MFish discussion

- 237 The setting of TACs relies on determining a level of catch that will ensure the sustainability of kahawai stocks. The decision on TACCs is a separate one. In determining TACCs for kahawai stocks you are free to decide between MFish proposals or consider alternatives based on submissions if you so wish.
- 238 There have been changes to the estimates of commercial utilisation proposed in the IPP. The IPP proposed that allocation of the TACC be based on the average of the most recent five years of commercial landings data. Submissions have noted that commercial landings data used in the IPP are less than those reported by the Plenary report¹⁰. MFish notes that some of this discrepancy is due to data reported as being disposed to the Crown, retained on board, or seized by the Crown being excluded from total landings and kahawai reported being used for bait being included in totals derived for the IPP.
- 239 However of more significance, when allocating landings data to the new QMAs to apply from 1 October 2004 some of the landing data was omitted. This occurred when kahawai catch was not reported in the effort section of catch and effort landing returns (only the top five species for any fishing event are recorded in this way for some fishing methods) and could not be allocated to a fishing return area. To correct this omission, MFish has recalculated commercial landings by prorating fishstock totals that can be assigned by area up to the national landings data total. MFish has also included the most recent year of catch data in the five-year period. This was incomplete at the time of preparation of the IPP. These changes have the effect of increasing some of the estimates of commercial utilisation by about 5% (refer Table 8).
- 240 MFish has adjusted the quantitative estimates of current utilisation on the basis of new information and submissions. These estimates of current commercial utilisation are the basis of one option for setting TACCs. Within TACs reduced by 15% from estimated levels of current commercial and recreational utilisation MFish proposes that TACCs are based on that same proportional reduction. That is TACCs are based on the average of the most recent five years of commercial landings reduced by 15% for some key kahawai stocks (KAH 1, KAH 2, KAH 3 and KAH 8).

¹⁰ J.H. Annala, K.J. Sullivan, C.J.O'Brien, N.W.McL. Smith & S. M. Grayling **Report from the Fishery Assessment Plenary, May 2003 stock assessments and yield estimates Part 1: Albacore to Ling.**

- 241 Some commercial submissions propose that a longer time series of commercial catch should be used to as a basis for determining TACCs. In recommending current landings as a basis for TACCs, MFish acknowledges that reduced commercial catches have already come about due to the introduction of purse seine catch limits. Further, MFish acknowledges that some industry participants have applied additional voluntary constraints such as voluntary closed areas and a fishing season, which have further limited opportunities for commercial catch within purse seine catch limits (KAH 3). MFish considers that these public policy considerations already in place for the fishery should be retained and therefore landings based on the current management arrangements in the fishery should be used to develop allocation options.
- 242 MFish is not dismissing the efforts taken by commercial fishers to conserve the fishery. Nor is MFish, by the options proposed, intending to penalise commercial fishers for any efforts that they have taken to address conflicts with recreational kahawai fishers. MFish notes that similar actions have been taken by recreational fishers, in particular the catch and release practice adopted by some recreational fishers. There is no practical way of determining the relative contribution of measures undertaken by each sector in ensuring the sustainability of kahawai stocks. By default, the baseline approach is to use estimates of current landings to reflect current reliance on the stocks.

Table 8: TACC options (MFish preferred options in bold) for kahawai stocks:

TACC option and proponent	KAH 1	KAH 2	KAH 3	KAH 4	KAH 8	KAH 10	Total
IPP	1,480	710	490	10	635	10	3,335
Current utilisation (MFish)	1,405	925	535	10	680	10	3,565
Proportional reduction (MFish)	1,195	785	455	10	580	10	3,035
Sanford	2,127	1,085	1,239	10	729	10	5,200
Non-Commercial Fishers	430	115	155	10	565	1	1,276
RFC*	330	125	200	10	418	10	1,093

- 243 While commercial purse seine catch limits currently apply to kahawai, the specific limits pertain only to purse seining when kahawai is the target species. It is therefore incorrect of Mark Feldman and other recreational submitters to compare the TACCs proposed in the IPP and the current commercial catch limits and infer that MFish proposals were to increase the level of commercial fishing. in some fishstocks. Catches by methods other than purse seine are not currently limited. TACCs will constrain all commercial landings whether caught as target or bycatch and regardless of fishing method.
- 244 MFish does not consider it necessary to discount any catch history for catches in excess of the KAH 1 purse seine limit as proposed by Non-Commercial fishers. This is because there is no illegal over catch reported in excess of commercial catch limits. Specific limits pertain only to purse seining when targeting kahawai. Any kahawai caught when purse seining for other species or as a target or bycatch of any other method may be legally landed over and above the purse seine limit.

- 245 There are economic impacts associated with adopting these proposed TACCs. MFish notes that the TACC proposed under proportional reduction is a 15% reduction in average landings taken in the five most recent fishing years for key stocks. The following section contains an assessment of possible economic impacts associated with TACC options. At your discretion, socio-economic impacts are relevant to your consideration of TACCs particularly those that involve a reduction from current levels of commercial use.

Loss of economic return

- 246 While there might be a number of possible economic effects from setting TACs at the level proposed in the IPP those that were quantifiable were minor. Lost opportunity costs (associated with the limitation on expansion of commercial catch) needed to be weighed against the uncertainty in current stock status, the value of kahawai as a shared fishery and the importance of this species in an ecological context.
- 247 MFish has evaluated the potential economic impact of TACC options on Industry in more detail.

Restructuring costs

- 248 There are short-term impacts arising from introducing kahawai into the QMS associated with the need for individual fishers to acquire quota to reflect their current fishing operations. Kahawai landings in the criteria years for catch history were substantially higher than they are currently. This has led to a situation where the sum of provisional catch history exceeds most of the proposed TACCs for kahawai stocks. Unless provisional catch history is cancelled (this occurs if it is not transferred) current fishers who were also fishing during the criteria years will have their provisional catch history reduced. The level of reduction is dependent on the TACC that is finally set. For any of the TACC options proposed there is likely to be a reduction in provisional catch history (that is provisional catch history will transfer to a smaller share of actual quota). Accordingly once quota is allocated, some current fishers may hold insufficient quota to cover kahawai landings from their current fishing operations.
- 249 However, under a QMS regime the balancing regime will require fishers landing kahawai without annual catch entitlement (ACE) to pay the deemed value. Differential deemed values are also proposed. Those fishers consistently landing kahawai, particularly those landing kahawai as an unavoidable bycatch, will place a greater value on quota to avoid a future stream of deemed value payments. This will create an incentive for quota to flow to those fishers with a long-term interest in the fishery. MFish expects that there will be short-term restructuring costs for these long-term fishers while quota is repositioned to where it is most required and valued. A similar situation (and impact) is anticipated for new entrants to target fisheries of which kahawai is a bycatch who will receive no allocation of kahawai quota.

Reference points

- 250 MFish has used reference points to compare the socio-economic impacts of TACC options as follows:

- a) Current utilisation; and
 - b) Average bycatch
- 251 The MFish estimate of current commercial utilisation forms the basis of the status quo fishery. Accordingly it is a useful reference point for TACC options proposed.
- 252 A further reference point for any potential economic impact is the constraint a shortage of ACE for bycatch species might impose on target fisheries. Kahawai bycatch at moderate levels is associated with target fishing for jack mackerels, trevally, snapper and grey mullet. The level of bycatch reported has been relatively stable over the past ten years in KAH1 and KAH 3. Accordingly, MFish considers that in these areas the difference between total commercial kahawai landings and those reported as caught when targeting kahawai might represent a minimum level in terms of a manageable bycatch.
- 253 Recently reported bycatch levels are based on current fishing methods in use in the fishery. As most of the bycatch of kahawai is in the purse seine fishery for jack mackerels and the trawl fisheries for trevally and snapper incidental bycatches of kahawai can probably not be actively managed by fishers.
- 254 In KAH 2 and KAH 8 the level of reported bycatch is more variable between years. However, only in KAH 8 is the average level of bycatch greater than the target catch.

Table 9: Reference points (tonnes of kahawai) for evaluating annual loss of economic return

QMA	1	2	3	8	Total
Current utilisation	1,405	925	535	680	3,545
Average bycatch (1997-02)	410	225	260	675	1,570

Estimates of loss of economic return

- 255 MFish has estimated the potential loss of economic return with respect to the reference points above for each of the following factors:
- a) loss in earnings from kahawai (based on port price);
 - b) loss in quota value; and
 - c) potential deemed value costs.
- 256 Commercial impacts can be measured as direct opportunity costs. A tonne of kahawai has a value and any reduction in tonnage for the commercial sector as a result of a lower TACC can be measured as an opportunity cost. MFish considers that impacts can best be measured by asset value and by forgone annual earnings as provided by the port price of kahawai (MFish notes that port prices will overestimate annual earnings as these include handling costs).
- 257 In the IPP asset value (quota value) for kahawai was estimated between \$1 700 and \$5 100. MFish accepts that there is uncertainty in estimations of the future quota price for kahawai but in the absence of any alternative asset values provided by submissions, consider these to be the best available information.
- 258 MFish has evaluated loss of economic return for three TACC options against points of comparison. These are:

- a) The Sanford option;
 - b) Proportional reduction option; and
 - c) Non-Commercial Fishers option
- 259 Sanford has submitted that it prefers that the MCY estimate of 8 200 tonnes be used as the basis of setting TACCs after allowances are made for non-commercial fishing. MFish has used the industry proposal as a point of comparison to evaluate TACC options and assess the potential impacts of the TACC options proposed. MFish notes that within that level of TAC Sanford proposes greater TACCs than other options.
- 260 The Proportional Reduction TACC option is based on an arbitrary 15% reduction from current commercial levels of use. MFish has used the alternative MFish proposal as a point of comparison to evaluate TACC options and assess the potential impacts of the TACC options proposed.
- 261 Non-Commercial Fishers has submitted that it prefers that a revised MCY estimate of 6 900 tonnes be used as the basis of setting TACCs after allowances are made for non-commercial fishing. MFish has used the recreational proposal as a point of comparison to evaluate TACC options and assess the potential impacts of the TACC options proposed.
- 262 Taking the difference between each TACC option and the reference point and multiplying this difference by the port price of \$0.85 for all stocks estimates the forgone annual earnings associated with each TACC option.
- 263 Taking the difference between each TACC option and the reference point and multiplying by the estimate of quota value per tonne for all stocks estimates the potential forgone quota value. As mentioned above the quota value is estimated to range between \$1 700 and \$5 100
- 264 For associated fisheries, economic impacts can occur when ACE is not available to cover the inevitable bycatch associated with other target fisheries. Impacts include the payment of deemed values for any kahawai taken above ACE.
- 265 The potential for costs associated with payment of deemed values is estimated from taking the difference between each TACC option and the average bycatch and multiplying by the proposed deemed values of \$610 or 660 per tonne. MFish notes that this assessment is based on the fishery as a whole. The potential for deemed value costs is further influenced by the circumstances of individual fishers with respect to their future quota holdings of kahawai. MFish notes that this analysis is based on the payment of annual deemed values and does not apply to differential deemed value rates. If differential deemed value rates are incurred the impacts could be up to two fold greater.
- 266 An alternative to the payment of deemed value when there is insufficient ACE to cover bycatch is that fishers could stop fishing for their target species. MFish is not aware of any current situation where the landing of target species is constrained by the level of bycatch TACCs. Typically when landings are taken in excess of the bycatch TACC deemed values are paid. Accordingly, MFish does not consider there will be any potential costs of foregone fishing for associated species due to kahawai bycatch limitations.

267 The assessment of the potential loss of economic return associated with TACC options is summarised in Table 10.

Table 10: Assessment of potential loss of economic return for TACC options with forgone return in brackets (in thousands of \$)

Potential Impact	Point of comparison	KAH 1	KAH 2	KAH 3	KAH 8
Current utilisation					
Port price	Sanford proposal	614	136	598	42
	Proportional reduction	(178)	(119)	(68)	(85)
	Non-Commercial Fishers	(829)	(689)	(323)	(98)
Quota value	Sanford proposal	1,227-3,682	272-816	1,196-3,590	83-250
	Proportional reduction	(357-1,071)	(238-714)	(136-408)	(170-510)
	Non-Commercial Fishers	(1,658-4,973)	(1,377-4,131)	(646-1,938)	(196-587)
Average Bycatch					
Deemed value	Sanford proposal	0	0	0	0
	Proportional reduction	0	0	0	(58)
	Non-Commercial Fishers	0	(67)	(64)	(67)

Conclusion

268 MFish notes that adopting the current utilisation option imposes no costs greater than reference points.

269 MFish concludes that restructuring costs above what may be usual for a QMS introduction are likely for kahawai because historical catch (and therefore PCH) is higher than any TACC option proposed. MFish considers that these costs will be short term but are relevant for you to consider. MFish notes that fishers will incur restructuring costs under any of the TACC options proposed.

270 Assessing loss of economic return for kahawai TACC options is problematic. MFish has therefore provided a range of reference points for you to consider with respect to the choice of TACC options. MFish has used port prices and derived an asset value (quota price) to assess opportunity costs of TACC options with respect to these reference points. Because no quota market currently exists for kahawai, the assessment has relied on proxy values. MFish notes that there is uncertainty associated with this approach, however it is considered the best information currently available.

271 MFish notes that adopting the Sanford option will increase economic returns in comparison to current levels of utilisation.

272 Adopting the proportional reduction option will result in forgone port price earnings and quota value of 15% in comparison to current utilisation. In addition, MFish notes that adopting a proportional reduction of commercial catches in KAH 8 reduces the TACC below the average landings of bycatch. This would mean incurring the payment of deemed values for this overcatch. The level of bycatch is variable and catches have exceeded the proposed TACC in only four of the past fifteen years.

Nevertheless, on average deemed value payments of \$58 000 per annum might be expected by adopting TACCs that are proportionally reduced.

- 273 MFish concludes that apart from forgoing annual economic returns and asset values with respect to setting TACCs at the greater values of the Sanford and current utilisation options, the only other impact incurred by setting TACCs at the level of the proportional reduction option is in KAH 8, where deemed values may be occurred from over catching kahawai as a bycatch in some years.
- 274 Adopting the Non-Commercial Fishers option will result in concomitant forgone port prices and quota value of about 25% in comparison to current utilisation. In addition, MFish notes that adopting this proposal would reduce the TACC below the average landings of bycatch in KAH 2, KAH 3 and KAH 8. This would mean incurring the payment of deemed values for this overcatch.

Allowances for other sources of mortality

MFish initial position

- 275 The IPP proposed setting a nominal allowance of 5% of the average reported purse seine landings for the last five years in accordance with the legislative requirement to provide an allowance for other sources of fishing related mortality.

Submissions

- 276 **Sanford** submits that purse seine fishing is a benign method because fish are alive until they are in the hold of the vessel. As a result any catch can be released from the net in the event of gear problems. Accordingly, it submits that an allowance for fishing-related mortality is unnecessary.
- 277 **Non-Commercial Fishers** submit that set netting and other commercial methods result in incidental mortality of kahawai. It recommends other sources of fishing related mortality be set on the basis of 5% of all commercial methods.
- 278 **Richard Pollock** submits that illegal selling of kahawai is a common occurrence and should be provided for by way of this allowance.

MFish response

- 279 The IPP proposal was based on a nominal value for one particular method of commercial fishing. MFish does not agree with Sanford that purse seining is completely benign and in the event of gear problems all fish are unharmed. Reports suggest that schools sometimes merge dragging the gear under water and allowing kahawai to escape. The trauma associated with this is likely to cause incidental mortality. MFish notes the submission of Non-Commercial Fishers that other commercial methods also result in incidental mortality. However, MFish believes that any assumptions relating to wider application of this allowance should also extend to recreational fishers (that are known to practise catch and release resulting in further unknown levels of incidental mortality).

- 280 Accordingly, MFish proposes changing the procedures for estimating other sources of mortality. It proposes setting an arbitrary allowance for incidental mortality on the basis of 2% of TACs and proposes to adjust this allowance as new information is obtained. MFish notes that the level of incidental mortality will vary depending on the management options being considered and are based on assumptions that require further investigation.
- 281 The IPP noted at paragraph 53 that there is no information on the current level of illegal catch. MFish notes Richard Pollock's submission that an allowance for this should be made but considers that this can be incorporated in the generic allowance, which is now proposed as a proportion of TACs.

Other management measures

Method restrictions

MFish initial position

- 282 The IPP noted that there is currently no provision for considering spatial allocation within the process for setting sustainability measures and continued voluntary arrangements between sectors to retain existing spatial arrangements will be required when kahawai are managed within the QMS.

Submissions

- 283 The **RFC** submits that a review of area restrictions is overdue and they submit many of the areas currently subject to voluntary closure are too small. Further the RFC submits that the Hauraki Gulf should be closed to purse seining by regulation.
- 284 **Wayne Taylor** (on behalf of Ngāti Kahungunu, Ngāti Pahauwera and Moeangiangi 42 N owners) notes that there is currently a non-commercial area situated between the Waihua and Moeangiangi Rivers (Hawke Bay) set aside as a breeding ground for many species of fish. He submits support for extending this area to the twelve-mile limit to confer additional protection for all fish species but in particular for kahawai.
- 285 **The Kaikoura Boating Club** submits that the plateau areas on either side of the Kaikoura Peninsular leave the schooling kahawai vulnerable to purse seining. It supports making the current voluntary agreement pertaining to the area more permanent.

MFish response

- 286 The IPP noted that a number of time and area constraints on purse seining are in place as voluntary arrangements. While there is a need for a review of spatial management arrangements for kahawai in the near future, MFish considers that spatial arrangements are matters for stakeholders to address.
- 287 Once kahawai is introduced into the QMS, commercial stakeholders (quota owners) will be more readily identifiable and MFish anticipates that the development of stakeholder management arrangements will be facilitated. This will in turn improve

the prospects of stakeholder agreed resolution to any concerns regarding spatial conflict that may occur in the fishery.

- 288 In addition the dispute procedures of the Act are available at any stage if recreational fishers consider that their fishing interests are adversely affected by commercial fishing.
- 289 The approved dispute procedure is intended to provide a process for stakeholders to resolve disputes without recourse to regulation. If a dispute remains unresolved the Minister of Fisheries can be asked to resolve that dispute. An important element of the dispute procedure is that if one party to the dispute decides not to participate in the process the Minister of Fisheries can still be asked to make a determination.
- 290 With regard to the RFC submission that the closure of the Hauraki Gulf to purse seining should be regulated, MFish notes that this closure has operated effectively as a voluntary arrangement for a number of years without recourse to regulation. The ability to regulate such a measure other than for sustainability purposes is limited unless it is the outcome of a dispute procedure. To date no such procedure has been initiated for kahawai. A similar situation applies for the other closure to commercial fishing proposed in the submission of the Kaikoura Boating Club.
- 291 With regard to the submission of Wayne Taylor that an extension to the closure to commercial fishing would provide protection for kahawai (and other species) in Hawke Bay, MFish notes that the sustainability benefits of a spatial closure are not clear given the pelagic and migratory habits of kahawai. MFish considers that the key measure required ensuring the sustainability of kahawai is the setting of TACs at an appropriate level.

Deemed value and overfishing thresholds

MFish initial position

- 292 MFish proposed two options for setting deemed values for kahawai (based on the 2002 port price). These were to base the annual deemed value on either 75% (“all other fishstocks”) or 200% (“high value single species fisheries fishstocks”) of the port price for kahawai.
- 293 In addition, MFish proposed in the IPP that differential deemed values apply and did not propose to set any over fishing threshold for kahawai.

Submissions

- 294 **TOKM** and **SeaFIC** both submit that kahawai should be classed as an “all other fishstocks” for deemed value purposes and that the annual deemed value should be based on 75% of the port price for kahawai. Further, TOKM sees no need for the application of differential deemed values or overfishing threshold for kahawai.
- 295 **NIFCL** strongly oppose the unilateral departure from the deemed values policy framework to apply a factor of 200% of the port price for deemed values. NIFCL submit that kahawai clearly fits within the “all other fishstocks” category and 75% of the port price should apply to this species.

- 296 **Non-Commercial Fishers** submit that if the catch history of the purse seine target fishery is removed then the deemed value could be set at \$0.32. Otherwise the deemed value must be set at \$0.86.

MFish response

- 297 MFish considers that deemed values for kahawai should be set in a way that encourages fishers not to fish in excess of ACE because it is a shared fishery of considerable importance to other sectors and there are concerns with regard to the status of kahawai stocks. However, MFish acknowledges that there is a balance in setting deemed values to avoid encouraging discarding of catch at sea. While the majority of kahawai commercial catch in key stocks is taken as a single species target by purse seine, a component of the fishery (the majority in some stocks) is taken as a bycatch. MFish accepts that, in the short term, the best fit for kahawai is within the definition of “all other fishstocks” and that deemed values should be set at 75% of port price.
- 298 The performance of the deemed value in meeting the objective for the fishery will be subject to review. Further, in accordance with the policy provisions, MFish considers that differential deemed values should apply in order to limit the incentives for individual fishers to continue fishing in excess of ACE.
- 299 MFish notes that the proposal to set deemed values was based on 2002 port prices. Port price information for 2003 is now available. In accordance with the use of best available information MFish proposes deemed values be based on the 2003 price. This has the effect of increasing the deemed values proposed in the IPP for any given option.

Table 11: Proposals to set deemed values for kahawai:

Proposal	fishstock	Survey port price (\$/kg)	Proposed % factor	Proposed interim Deemed Value (\$/kg)	Proposed annual Deemed Value	Differential deemed value (Y/N)	Over fishing threshold
IPP (option 1)	KAH 1-10	\$0.43	75%	\$0.16	\$0.32	Yes	No
IPP (option 2)	KAH 1-10	\$0.43	200%	\$0.43	\$0.86	Yes	No
FAP	KAH 1	\$0.88	75%	\$0.33	\$0.66	Yes	No
FAP	KAH 2-10	\$0.81	75%	\$0.30	\$0.61	Yes	No

Consequential amendment to regulation

MFish initial position

300 The IPP proposed to amend the fishing permits of some permit holders to remove the schedule imposing purse seine catch limits for FMAs 1 and 9 combined, FMA 2 and FMAs 3-8.

Submissions

301 Industry submissions support the proposal.

MFish response

302 MFish confirms its proposal to revoke permit conditions as an unnecessary constraint on harvesting.

Legal Obligations

303 The statutory considerations that must be taken into account when setting a TAC and allowances for kahawai were identified in the IPP (refer to paragraph 65 (a-m)). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Conclusion

304 In introducing kahawai into the QMS, you have decisions to make about:

- a) The target stock level size (at or above B_{MSY});
- b) The level of the TACs and allocations to the fishing sectors; and
- c) Other associated management measures.

305 The IPP outlined legislative obligations in relation to these matters and suggested preferred options. MFish has received numerous submissions on the IPP proposals and these have been evaluated as part of this advice paper and full submissions are provided under separate cover (summaries only of e-mail submissions).

306 Kahawai is an important recreational species able to be fished from shore and by boat. The management proposals for this fishery have attracted significant opposition from

the recreational sector. Recreational fishers have strongly expressed concerns over what they perceive is a marked decline in the amount and size of kahawai available to them in recent years and attribute this decline to commercial fishing and purse seining for kahawai in particular.

- 307 Industry place reliance on kahawai as both a target and bycatch species. Industry also opposes the MFish initial proposals and says that TACs and their share of those should be higher. Industry says that there has been an historical decline in biomass associated with fishing the kahawai stock down towards target biomass levels but in recent years the fishery has been only lightly exploited. Industry suggests that there is a lack of scientific information to support any suggestion of a recent decline in stock size.
- 308 The information available in support of decisions on TACs, allowances and TACCs is uncertain. Estimates of current use for some sectors are uncertain, there is a stock assessment for kahawai but it is dated (1996) and inputs into the assessment are increasingly regarded as being unreliable. The stock assessment indicated that by 1996 the biomass of kahawai had declined to around 50% of its original level. Information on recent trends in stock abundance is limited but does not indicate a continued decline in stock size. This needs to be considered in contrast to the recreational (and some customary) submissions that suggest that the stocks have declined below acceptable levels.
- 309 Both the recreational sector and some parts of industry support managing kahawai at a level of biomass above B_{MSY} . MFish does not regard the setting of a specific target level above B_{MSY} to be a critical issue that you need to determine at this time when setting TACs for kahawai stocks. MFish has concluded that rather than determining a specific stock size as a target level (given the lack of information about current biomass and the change in catch levels necessary to achieve any particular target level) you should consider the socio-economic benefits at various stock sizes in relation to the TAC options proposed for your consideration.
- 310 For the purposes of setting TACs two approaches are available:
- a) Using estimates of yield from the 1996 stock assessment model; and
 - b) Using estimates of current use of the fishery (or a proportion of that use).
- 311 The 1996 stock assessment provides estimates of yield ranging between 5 100-14 200 tonnes. MFish proposed that estimates based on a single natural morality estimate were the best available resulting in yield estimates of 7 600 and 8 200 tonnes. Some commercial and recreational submissions support you basing your TAC decisions on these yield estimates but differ on the level of yield that should be chosen. Although relevant as a reference point for TAC setting, MFish considers that the stock assessment information is too uncertain and dated for using as a basis for setting TACs.
- 312 The alternative is to base TACs directly on current utilisation of the fishery. This method has the advantage of reflecting public policy considerations already made for the fishery and current reliance on the fishery by each sector. These considerations are reflected in the current management arrangements for the fishery and current catch.

- 313 MFish considers that recreational utilisation is now greater than portrayed in the IPP. Technical experts have recently reviewed the three most recent recreational harvest surveys and advise that the 1996 estimates (used in an average of recreational catch in the IPP) should not be used. Despite a cautionary note from technical experts MFish now considers that the most recent surveys provide the best available information on recreational catch and have used these as a basis for estimating current recreational use of kahawai. You should note that, while uncertain, estimates are now substantially higher and this has had consequences for the assessment of whether current kahawai catch is sustainable.
- 314 Kahawai supports important Māori customary fisheries but the size of the catch is unknown and can only be estimated by assuming a proportion of the recreational catch. MFish has adjusted estimates of customary Maori use from 50% of recreational use estimates to 25% having considered submissions and following revisions of the recreational estimates of use.
- 315 Commercial catches declined after peaking at 9 600 tonnes in 1987-88, reducing to 2 900 tonnes in 2002-03. The majority of recent commercial landings of kahawai is still taken by purse seining, however about 45% of the catch is now taken as a by catch of other fisheries. MFish has revised estimates of current commercial use to address errors in the IPP identified in submission but has not accepted submissions that more historical landings, or the use of CCLs, should be incorporated into the assessment of current commercial use. Rather, MFish confirms its view that the average of the most recent five fishing years should form the basis of the estimates of current commercial use. You should note that this has implications for the distribution of TACCs between kahawai stocks in MFish proposals.
- 316 Current estimates of recreational catch exceed that of the commercial sector and when combined with estimates of customary Maori catch the non-commercial fishery is well in excess of the size of the current commercial fishery. You should note that there is uncertainty in all estimates of current use. This uncertainty is particularly relevant because current levels of combined use lead MFish to conclude that current catch of kahawai may not be sustainable.
- 317 A nationwide combined estimate of recreational catch, customary catch, fishing related mortality and reported commercial landings of 8 767 tonnes exceeds yield estimates based on the 1996 stock assessment (7 600 and 8 200 tonnes). While these estimates are outdated and uncertain they remain the only reference points of sustainable yield for kahawai. There is a risk that current utilisation of kahawai stocks may not be sustainable and there are also widespread perceptions (see the discussion on recreational perception surveys in Appendix 1) from the recreational fishing sector that a rebuild of kahawai stocks is required.
- 318 Having regard to available information which, although uncertain, suggests there is a risk associated with current levels of catch of 8 767 tonnes in terms of:
- a) a 1996 stock assessment with best available estimates of MCY of 7 600 tonnes and 8 200 tonnes;
 - b) 1996 information on status of stock relative to B_{MSY} (50%);
 - c) considerable uncertainty in the estimates of yield and stock status for kahawai;

- d) some agreement by sectors for a target stock level above B_{MSY} ;
 - e) a commercial view that there is no evidence of declining recreational catches, numbers of schools of kahawai or changes in the level of bycatch in recent years;
 - f) a strong recreational perception about declining abundance, availability and size of fish in the main stocks both long term and in recent years.
 - g) a revised estimate of MCY submitted by Non-Commercial Fishers (6 900 tonnes) as a basis for combined TACs;
 - h) the important role of kahawai in the ecosystem.
- 319 The MFish preferred TAC options are to either base combined TACs on current utilisation or on an arbitrary 15% reduction in recreational and commercial use of key kahawai stocks (KAH 1, KAH 2; KAH 3 and KAH 8). If you consider that current utilisation is at levels that present a risk to the stock you might consider that in these circumstances a reduction is indicated. A level of reduction of 15% of current utilisation is recommended. Such a level is significant but it is proposed as a balance between certainty and impact. Should you consider that an alternative combined TAC should be considered then TAC options proposed by stakeholders are available for your consideration.
- 320 MFish notes that the TAC option based on a reduction of current utilisation will have socio-economic impacts on commercial fishers. For example, Sanford emphasise the importance of kahawai to their purse seine operations. Management intervention will also be required to constrain recreational catch if you elect the lower of the TAC options proposed. These impacts should be considered along with weighting of the uncertain information on stock status when making your decision and you should take into account the fact that, while a new stock assessment of kahawai is planned, results will not be available for consideration until the 2006-07 year.
- 321 The IPP and this FAP contain discussion on the use of alternative options when considering how to allow for non-commercial use– the “claims based” and “utility” approaches. The policy discussion on utility and claims based approaches is not intended to fetter your discretion, but rather provides policy guidance in order to provide a more robust framework when considering allowances.
- 322 The utility model is strongly opposed by industry and TOKM on the basis that this approach has the potential to undermine the QMS, the integrity of ITQ, and in the case of TOKM the 1992 Deed of Settlement. The basis of much of the non-commercial opposition to commercial fishing for kahawai (and purse seining in particular) is based on the perception that they value the fishery more highly than commercial fishers.
- 323 MFish considers that there is subjectivity attached to consideration of both catch history and utility options. The period chosen for commercial catch history and estimates of non-commercial catch are contentious. MFish considers that much of the critique of the utility concept can be addressed however MFish confirms its view (acknowledged in the IPP) that there is a great deal of uncertainty attached to quantitative assessments of value. You should weight this uncertainty if you consider the use of utility information as a basis for determining allocations for kahawai.

- 324 There are competing demands for kahawai in excess of the proposed allowances within TACs. You are not required to fully satisfy the demands of any sector group. In determining allocations you must consider competing demands for the resource and the socio-economic impacts of allocations proposed.

Table 12: Final proposal to set TACs, allowances and TACCs for kahawai.

Stock	TAC	Customary allowance	Recreational allowance	TACC	Fishing-related incidental mortality
KAH 1					
Current utilisation	4,235	550	2,195	1,405	85
Proportional reduction	3,685	550	1,865	1,195	75
KAH 2					
Current utilisation	1,970	205	800	925	40
Proportional	1,705	205	680	785	35
KAH 3					
Current utilisation	1,190	125	510	535	20
Proportional reduction	1,035	125	435	455	20
KAH 4	16	1	5	10	0
KAH 8					
Current utilisation	1,330	125	500	680	25
Proportional reduction	1,155	125	425	580	25
KAH 10	16	1	5	10	0

- 325 On balance, MFish considers that the allocations shown in Table 12 appropriately reflect competing demands, current use in the fishery, and the socio-economic effects of current versus reduced use. To a large extent the options for determining allowances and TACCs will be driven by the TAC option you consider reasonable. If you agree to set TACs based on a 15% reduction to average landings, MFish considers that catch history information is a more certain basis for considering allowances for non-commercial use and has a policy preference for this option. MFish support a proportional reduction to recreational allowances and TACCs for the fishery if the lower TAC option is chosen.
- 326 If you agree to set an allowance for recreational fishing less than the current level of use, MFish considers that consultation with the recreational sector will be required on the best way to achieve this. MFish's initial view is by a reduction in daily bag limit however MFish will provide you with further advice on how this might be achieved following consultation with recreational fishing interests.
- 327 In respect of associated management measures MFish proposes that you set a deemed value for kahawai, agree that differential deemed values apply and note that existing permit conditions setting purse seine catch limits will be revoked.

Recommendations

- 328 MFish recommends that you
- Note** the contents of this advice and attached stakeholder submissions on kahawai management proposals,
 - Note** that the information regarding the status of kahawai stocks is uncertain

- c) **Note** that having regard to the uncertainty surrounding stock status, MFish has a preference for the lower of the TAC options proposed,
- d) **Note** that having regard to the uncertainty in estimates of utility for kahawai, and the views of stakeholders, MFish has a preference for the allowances and TACCs within the lower of the TACs proposed to be determined in proportion to the current use of recreational and commercial sectors and;

EITHER

- e) **Agree** to set a TAC of 4 235 tonnes for KAH 1 and within that TAC set:
 - i) A customary allowance of 550 tonnes;
 - ii) A recreational allowance of 2 195 tonnes;
 - iii) An allowance for other fishing-related mortality of 85 tonnes; and
 - iv) A TACC of 1 405 tonnes.
- f) **Agree** to set a TAC of 1 970 tonnes for KAH 2 and within that TAC set:
 - i) A customary allowance of 205 tonnes;
 - ii) A recreational allowance of 800 tonnes;
 - iii) An allowance for other fishing-related mortality of 40 tonnes; and
 - iv) A TACC of 925 tonnes.
- g) **Agree** to set a TAC of 1 190 tonnes for KAH 3 and within that TAC set:
 - i) A customary allowance of 125 tonne;
 - ii) A recreational allowance of 510 tonne;
 - iii) An allowance for other fishing-related mortality of 20 tonne; and
 - iv) A TACC of 535 tonnes.
- h) **Agree** to set a TAC of 16 tonnes for KAH 4 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.
- i) **Agree** to set a TAC of 1 330 tonnes for KAH 8 and within that TAC set:
 - i) A customary allowance of 125 tonnes;
 - ii) A recreational allowance of 500 tonnes;
 - iii) An allowance for other fishing-related mortality of 25 tonnes; and
 - iv) A TACC of 680 tonnes.
- j) **Agree** to set a TAC of 16 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and

OR

- AND**

- 163

- ii) KAH 2, 3, 4, 8 & 10 \$0.61 / kg;
- r) **Agree** that differential deemed values apply;
- s) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns;
- t) **Note** that once kahawai becomes subject to the QMS fishing permit conditions applying purse seining catch limits and vessel restrictions on the taking of kahawai will no longer be applicable. Accordingly, the chief executive will revoke these fishing permit conditions;
- u) **Note** that if you elect to reduce the current use of kahawai MFish will initiate consultation with the recreational sector to determine the best method of achieving the required catch constraint.

ANNEX ONE

Other sources of information

MFish initial position

329 Other sources of information were summarised in the IPP in paragraph 102.

Submissions

330 **Mark Feldman** submits that the current biomass is unknown and MCY estimates pure conjecture. He and other recreational submitters consider that far more weight should be given to the following sources of information.

- a) **Recreational fishing perception surveys.** Recreational groups surveyed have repeatedly expressed concern about the state of the kahawai stocks. These are:
 - i) Readership surveys. The IPP discussed at paragraph 102 readership/club survey results, but Feldman submits it failed to mention the high level of experience of respondents (more than half of the respondents indicated that they had fished more than 20 years); and
 - ii) Responses from the option4 website.

Table 13: Number of option4 responses by fishstock

QMA	1	2	3	4	8	10
Number	1,194	257	99	7	487	10

Table 14: Years of fishing experience, days fished per year and perceptions of option4 respondents

Years of fishing	>20	11-20	5-10	<5
Percentage	76.8%	15.0%	6.2%	2.0%
Days fishing per year	>50	21-50	10-20	<10
Percentage	21.6%	49.9%	25.7%	2.8%
Stocks of kahawai have	declined a lot	declined a little	remained the same	increased a little
Percentage	88.1%	10.2%	1.5%	0.2%
Size of kahawai have			remained the same	decreased
Percentage		increased 0.8%	about the same 17.3%	81.9%
Numbers of feeding schools are	much more frequent	more frequent	same number	much less frequent
Percentage	0.2%	0.7%	2.6%	33.9%
				62.6%

- b) Summary of option4 email respondents is as follows with the response rate in brackets.
 - i) I support the option4/NZBGFC submission to restore the non-commercial kahawai fishery:

- Yes (1 443)
- No (10)
- ii) Do you think management objectives for kahawai should focus on restoring non-commercial access to a healthy fishery?
 - Yes (1 426)
 - No (22)
- iii) Should Commercial Fishing companies be targeting kahawai with purse seiners and spotter planes and then exporting their catch to low value markets (such as Australia for crayfish bait where it sells for about \$A1.20 per kg?)
 - Yes (11)
 - No (1 450)
- iv) Should fishery managers discount the catch history of bulk fishing practices before they make quota allocations to commercial fishers?
 - Yes (595)
 - No (694)
- v) What level would you like to see the kahawai fishery managed at?
 - there should be more kahawai available (1 165)
 - its about right (73)
 - there should be less kahawai available (209)
- vi) Would you like to see commercial catches of kahawai
 - increase (2)
 - stay the same (85)
 - decrease (1 389)

c) Fishing competition catch records and Club reports

i) New Zealand Angling Limited Event Catch Records

NZ Angling Limited submits that they have held saltwater fly-fishing events each year since beginning in 1994. Since 2000 a Kahawai world championship event was organised as part of the tournament for “all species”. NZ Angling Limited submits that since 2000 the proportion of kahawai to “other species” has declined and the average weight of kahawai has also reduced. The submission states that declining kahawai numbers has resulted in the cessation of the “Saltwater Sundays” programme in the Hauraki Gulf. It submits that the next most marked reductions in catch rates have been in Whangaroa Harbour in the Far North and to a lesser extent at the Bay of Islands.

ii) Club reports

The **RFC** reports that while there has been no change to the state of the kahawai fishery in the past twelve months, clubs fishing KAH 1 at Whakatane, Opotiki, TeKaha and Waihou Bay all reported poor tournament results for

kahawai. A tournament at Mount Maunganui of 115 anglers caught 57 kahawai and at Waihou Bay 92 anglers caught 9 kahawai.

The RFC report that until recently there appeared to be no significant decline in the recreational CPUE in KAH 2. However, clubs fishing KAH 2 such as Gisbourne, Napier, Waiarapa and Ngati have all noted a decline in the school sizes of kahawai. The Eades Fishing Tournament (Wanganui) had 800 anglers reporting the catch of one kahawai.

The RFC submission notes that locals in KAH 3 are reporting fewer mature fish, with juvenile fish present within the Marlborough Sounds but few schools elsewhere in the area.

Mark Roberts submits that members of the Pania Surfcasting Club (Napier) were able to catch 10 kahawai per weekend as a self-imposed club limit until 2000. Since members have been unable to catch 5 kahawai during a weekend. He submits that this change might be due to changes to currents or the availability of prey species, but doubts that fishing kahawai down to B_{MSY} is likely to improve the situation.

- d) **Tagging analysis.** Mark Feldman considers that important information was omitted from the IPP. He notes that tagging studies were undertaken during 1983 and 1991 and that a simple comparison of the tag return rates supports the conclusion of kahawai changing from a predominantly recreational to a predominantly commercial fishery during this time (the proportion had reduced from 72% of the 1983 tags to 27% of the 1991 tags being returned by recreational fishers).
- e) **Length based studies.** Mark Feldman considers that mean lengths of purse seine caught kahawai in the Bay of Plenty declined 5.7 cm between 1983 and 1992. Further, he submits that recreational caught fish measured at various locations during the same period show similar declines at every site examined.
- f) **Recreational catch per unit effort (CPUE).** Mark Feldman notes that little data is available to quantify the recreational catch during the 1980s prior to the development of the purse seine fishery. He cites the availability of recreational CPUE for the Motu River Mouth in 1982 that was repeated in 1992. While noting differences in approach by the two studies, he considers the comparison provides evidence of severely reducing recreational CPUE over this period (4.7 fish per hour for residents and 2.6 for visitors in 1982 as compared to 0.1 fish per hour in 1992).

Further, Mark Feldman does not agree with the conclusion reported in the IPP “that kahawai catch rates estimated at boat ramps during 1991 and 1994 might be artificially low”. This is because he believes:

- i) Catch data for the Motu River Mouth has also declined;
- ii) Any reasonable person would conclude that a catch of 0.4 kahawai per angler per trip to be a very poor catch rate;
- iii) The CPUE of snapper is three times greater than kahawai and it is well known that the snapper fishery is below B_{MSY} in the north.

- 331 The **RFC** submits that purse seining has been responsible for an overall decline in the stock status of kahawai. It submits that intensive purse seining in the Bay of Plenty and the top of the South Island has resulted in an overall decline of kahawai around the entire coast of New Zealand. This is explained by a “sink” hypothesis whereupon concentrated purse seining in hotspots creates a void into which kahawai from other areas ultimately sink. The RFC submits much of the same evidence to support their views as provided by Mark Feldman, apart from an additional point about Kaharoa trawl survey data.
- a) Kaharoa trawl survey data. The RFC cites a report summarising trawl survey results between 1982-93 (biennial trawl surveys were undertaken by the Ministry of Agriculture and Fisheries research vessel *Kaharoa* during this period). These research data suggested declining mean lengths of kahawai taken in trawl surveys on the west coast North Island and the Bay of Plenty during this period. The RFC submits that there may be two explanations for this reported decline:
- i) A major increase in recruitment
 - ii) A major increase in the removal of adults (overfishing)
- The RFC submit that recruitment indices for the Hauraki Gulf suggested poor recruitment during 1981, 1984, 1996 and for each year between 1987-91. Accordingly, the RFC concludes that decreases in mean lengths cannot be due to recruitment of small fish and so are most likely due to overfishing of the larger fish by purse seining.
- 332 **Non-Commercial Fishers** submit that there was considerable concern from recreational fishers about the disappearance of kahawai 15 years ago. The Minister shared that concern in the early 1990s because purse seine catch limits were introduced.
- 333 However, Non-Commercial Fishers submit that there is no evidence of a rebuild of fishstocks as reflected by non-commercial catch rates since. Catch rates of kahawai from the 1996 national boat ramp surveys show that fishers who report targeting kahawai catch just 0.79 kahawai per hour - in other words five hours fishing for four fish. Fishers who say they were targeting snapper on their trip (most trips in the north) caught just 0.11 kahawai per hour – in other words nine hours fishing for one kahawai.
- 334 **Sanford** notes that recreational fishing organisations have suggested that kahawai catch rates have declined substantially in all areas, and that this indicates a substantial decline in kahawai abundance due to high levels of commercial catch. Sanford submits there is a lack of data to support this assertion.
- 335 Sanford say that it is axiomatic that harvesting a fish stock will lead to a reduction in biomass, but submits that other factors (such as increased recreational fishing pressure and land use changes) will also affect kahawai availability in near shore waters. If kahawai stocks were under pressure, one would expect to see other signs of this, such as a reduction in the proportion of older fish, or reductions in catches by non-target fishing methods. In support of these statements Sanford submits:

- a) That the 1996 stock assessment does not support any hypothesis for over exploitation of the kahawai resource (discussed in next section);
- b) The most recent age frequency data from the late 1990s shows a broad spread of ages and a strong proportion of older fish, consistent with a relatively low exploitation rate¹¹.
- c) Sanford provides an analysis of commercial aerial sightings data and submits that these data do not show any clear trends. Sanford considers this analysis highlights the large variations in schooling kahawai from year to year, presumably as a result of environmental and other factors, which will affect availability of surface schooling fish to both recreational and commercial operators.
- d) Kahawai bycatch rates in non-target fisheries are not declining in proportion to any hypothesized declines in overall abundance. It submits that total bycatch has been relatively stable, or has increased, in spite of the reduction in trawl effort in some areas due to TACC reductions of the target species.

MFish response

Recreational fishing perceptions

- 336 Option4 respondents identified areas they fished and were able to choose any number of QMAs. Responses as a percentage of the totals are: QMA 1 (58%); QMA 2 (12.5%); QMA 3 (0.5%); QMA 8 (24%); QMA 4 and 10 attracted few responses. In comparison to the 2000-01 recreational diary results these proportions suggest that fewer QMA 2 and QMA 3 anglers, and a higher proportion of QMA 8 anglers, responded to the option4 website than might be expected.
- 337 Over 90% of Option4 respondents indicate that they have 11 or more years of fishing experience with over 70% having fished for 21 or more days a year, although it is unknown what species they might have been fishing for.
- 338 Almost 82% of respondents indicate that kahawai has “decreased” in size although 17% considered size has “remained the same”.
- 339 63% of respondents consider that the numbers of feeding schools are “much less frequent” in terms of their experience and 34% “less frequent”. MFish notes that 70% of respondents report their level of experience exceeding 20 years (before the introduction of purse seine catch limits). Nevertheless, only 2.6% of respondents report “about the same number” of schools in their experience and less than 1% reports any improvement.
- 340 88% of respondents indicate that they perceive stocks of kahawai have “declined a lot” and 10% that stocks have “declined a little”. This compares with a 1997 readership survey recording 47% of its respondents indicating that stocks had “declined significantly” and 32% that stocks had “declined a little”. This suggests that not only has the total percentage of respondents perceiving stocks to have

¹¹ 11 Taylor, P, D Ayers, B. Harthill and D. Fisher, 2004. **Characterisation of the amateur fishery for kahawai (*Arripus trutta*) in New Zealand. NIWA Client Report WLG2004-012.**

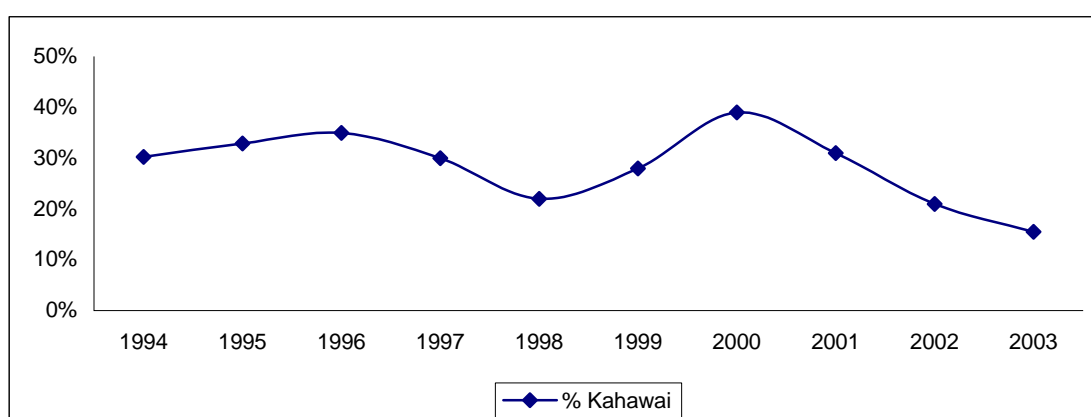
declined increased by 10% but that a greater percentage of respondents believe that this decline is more substantial than respondents did in 1997.

- 341 MFish notes that the questions differ subtly in their wording and therefore a direct comparison is not possible. The 1997 survey (2,002) attracted a slightly greater number of respondents in comparison to the option4 emails (1,790).

Fishing competition Catch Records

- 342 MFish has analysed data provided in submission showing the proportion of kahawai caught in comparison to other species (provided in the NZ Anglers submission of their tournament catch records) and provide the results below.

Figure 2: Proportion of kahawai caught in comparison to other species.



- 343 The proportion of kahawai caught in proportion to other species varied between 1994 and 2000. The proportion of kahawai to other species peaks in 2000 probably as a result of anglers' more actively targeting kahawai in comparison to other species as a result of the new dedicated tournament for kahawai. Since 2000 the ratio has declined.
- 344 Further interpretation is confounded by not knowing whether fishing patterns were maintained over this period. MFish notes that the number of kahawai caught per angler has reduced only slightly between 1994 (4.6 kahawai per angler) and 2003 (4.4 kahawai per angler). This suggests that the declining proportions of kahawai could be attributed to increased catches of other species.

Tagging analysis

- 345 MFish notes that the objective of tagging studies in the 1990s was to study the movements of kahawai and not to measure the proportion of catches by the fishing sectors. Any detailed analysis of tagging returns relies on tagged fish becoming well mixed within the wider population. However, the 1990s tagging studies were largely inconclusive because of the effect of tagging on kahawai physiology and behaviour. In addition, all tags recovered were not returned and the fishing effort distribution of the sectors was not the same. Accordingly, MFish does not consider the lack of any discussion of the tagging data to be a major omission from the advice. Neither does

MFish consider that these data are useful for determining the relative proportion of catches by sector groups as suggested by submissions.

Length based studies

- 346 Discussion at the 1994 Plenary highlighted the ability of purse seine vessels to selectively target kahawai by size. The Plenary concluded that historical comparison of purse seine catch did not provide reliable information on length frequency trends in the population.
- 347 MFish notes that a subsequent report has further highlighted that the schooling behaviour and short and long term movements makes sampling of kahawai lengths randomly and representively very difficult. Nevertheless, the report considered samples from the recreational fishery were better from a statistical point of view and recommended that the recreational fishery be used to monitor kahawai¹². Results of the first three years of the recreational monitoring have detected no changes in annual length frequencies between 2001-2003. As noted in the Sanford submission these results show a broad spread of ages and a strong proportion of older fish, which is consistent with a relatively low exploitation rate.
- 348 MFish notes the R.V. *Kaharoa* trawl survey data but considers that these small data sets are probably biased and unrepresentative of the kahawai population. Trawl surveys are not considered a good sampling method for kahawai because of their pelagic habit (trawl surveys sample fish mainly found on the seabed most effectively). The small number of samples obtained and the nature of the method suggest no helpful conclusions may be drawn from these data.

Recreational catch per unit effort (CPUE)

- 349 MFish agrees with submissions that little data is available to quantify recreational catch rates during the 1980s prior to the development of the purse seine fishery. However, an examination of landings rates from boat ramp surveys conducted in 1991, 1994, 1996, 1998, 2001, 2002 and 2003, showed that throughout the time series, landings rates have been similar in East Northland, Northland, and Hauraki Gulf, both in magnitude and in the pattern of fluctuations. Generally they have been lower in recent years than experienced in the mid 1990s, but similar to those observed in 1991. In the Bay of Plenty, landing rates have been higher and more variable than in the other areas¹¹.
- 350 While reported catch rates are low a range of factors including variations in the time spent targeting other species can explain this. Targeting kahawai can involve great amounts of time searching for the highly mobile schools of fish.
- 351 Dr Feldman submits that recreational surveys at the Motu River provide evidence of severely declining CPUE between 1982 and 1991. Dr Feldman notes that there are differences in approach between the surveys. MFish considers that these differences confound any conclusive comparison. MFish notes that the surveys differ both in area surveyed and the time surveyed. Probably of most importance is the time surveyed.

¹² Bradford, E. 2000 feasibility of sampling the recreational fishery to monitor the kahawai stock **New Zealand Fisheries Assessment Report 2000/11**

Runs of kahawai in the Motu River are highly seasonal. A study found that most of the kahawai at the Motu River are adults, many of which are not feeding, but are approaching sexual maturity, and may be part of a spawning migration¹³. Alternatively, because of the influence of the moon on the timing of runs of kahawai, their presence may be influenced by the availability of foods in the estuary such as smelt and whitebait. By surveying later in the year during 1991 it is possible that seasonal effects were responsible for the much lower CPUE. Alternatively there might have been changes to spawning migrations or changed river usage during 1982-91 may have reduced the runs of smelt or whitebait that are a food source for kahawai.

Commercial aerial sightings data

- 352 There is very limited information with which to examine trends in kahawai abundance. However, the aerial sightings database contains the longest available time series of information as data has been collected almost from the onset of purse seining. Aeroplanes are used to assist purse seine vessels locate surface schools of fish. The pilots of these planes record their flying effort, location and school sightings, which is furnished to MFish that maintain a database.
- 353 There are limitations on the use of these data as an index of relative abundance. Data collection is opportunistic, is not random and it has a commercial motive of assisting purse seine vessels locating schools of fish. Further, it is unknown what proportion of the population is seen and how this varies with environmental conditions. Therefore, at best, these data can be interpreted as only a rough index of relative abundance over time.
- 354 Nevertheless MFish notes that there have been studies to refine the quality of information that can be derived from aerial sightings data. The report prepared as part of the Sanford submission is the first step in an approach that is being developed elsewhere, in which the objective is to produce stock indices for schooling species standardised for a variety of environmental and fishery related variables. Data is presented for East Northland, Bay of Plenty and Hawkes Bay only. The Sanford report on aerial sightings is not standardised and has not been reviewed by the Pelagic Working Group.
- 355 Sanford submits that sighting of surface schools of kahawai is highly variable from year to year and that there has been no major decline in school size and abundance. MFish does not agree that this interpretation can be made from the data presented. Some of the indices appear to be suggesting strong declines. MFish suggests that no conclusions can be drawn from these data as presented. Analysis of aerial survey data is complex and is subject to an ongoing research program.

Commercial Bycatch

- 356 MFish does not agree with industry submissions that there is evidence of a stable bycatch CPUE and hence a stable stock abundance. There is a body of literature that has examined the assumption that changes in CPUE will, to some extent, reflect

¹³ Penlington B.P. 1988 The kahawai fishery at the Motu River mouth **New Zealand Freshwater Fisheries Report No 103**.

changes in stock abundance. However, the assumptions involved cannot always be tested and bycatch CPUE is not often a useful indicator of abundance in these types of fisheries. Where different target fisheries and fishing methods are combined, as is the case for kahawai, standardisation of the data will be required.

- 357 Careful consideration and standardisation of the measure of fishing effort and other factors are required for CPUE analysis to be useful. Trends in catching ability need consideration, as changes in fishing practice can contribute to changes in landings over time (an effect that may not be able to be disentangled from trends in abundance).
- 358 The use of CPUE analysis is much more problematic for a bycatch fishery. This is particularly so when, as is the case with kahawai, bycatch numbers and weight are relatively small per unit of effort.

ANNEX TWO

option4 Alert #6 - April 2004

Kahawai - time to stand up and fight for a fair go

Kahawai are about to be introduced into the Quota Management System. option4 have serious concerns that once again the Ministry of Fisheries (MFish) is putting the interests of commercial fishers above the rights of the public to access this fishery.

If you think the kahawai fishery is in bad shape now you will be outraged at the Ministry of Fisheries latest proposal. Not only do the Ministry believe there is no scarcity of kahawai, they also do not accept there is conflict between commercial and non-commercial fishers in this fishery.

[Have your say - Click here](#)

MFish proposes to issue commercial kahawai quota in perpetuity based on commercial catch histories and give the leftovers to the public.

Clearly the Ministry of Fisheries has decided to ignore the incessant public concerns regarding the poor state of the kahawai fisheries and conflict caused through excessive fishing over the years. Years of effort and participation in fisheries management forums by dedicated recreational fishers is to be dismissed and ignored.

The purse seine catch history will generate thousands of tonnes of quota developed through plundering this fishery to the detriment of all other users. Recreational leaders believe that using unsustainable target fishing as the basis for allocating quota is unfair and unjust and they are demanding that this catch history must not be used for allocating quota. It was generated at the expense of the rights of other users.

Ministry are proposing to reward those who have depleted the kahawai fishery by giving them excessive quotas. What's more, the Ministry proposal will allow the kahawai stocks to continue to fall by 60% before these excessive quotas are reduced. This is totally unacceptable.

The Ministries proposal will inevitably inflame the already high level of conflict between commercial and non commercial fishers as the public witness the ongoing disappearance of this fishery. Ministry fail to mention, let alone address, this inevitable consequence of their proposal

Once quota is allocated there is no agreed upon process for adjusting the non commercial share in the future. Allocation decisions made now will be the basis of indefinite argument. We may well find ourselves stuck with what we get today through this process.

Make no mistake; the proposal as it stands will effectively steal the fish from the 1,000,000 non commercial fishers to prop up a handful of commercial fishing companies who choose to target kahawai; companies who think its better to annihilate your kahawai (school by school by school) to supply an Australian cray fisherman with bait (frozen, 20kg block, \$A1.20 per kg) rather than

leave them alone and risk you catching some to feed your family. Obviously the Ministry of Fisheries holds the same view.

If we do nothing, they could well get away with this lunacy!!

If you have read enough and wish to make your submission now, go to the bottom of the page and click on "Have your Say".

Otherwise keep reading - it only gets worse

Why is option4 so outraged

The Ministry of Fisheries (MFish) are going to ignore the public's concerns about kahawai. This will result in our kahawai fishery as we once knew it being lost forever. This is theft – the dishonest taking of a public resource with no intention of returning it.

option4, NZ Big Game Fishing Council and NZ Recreational Fishing Council met with the Ministry on Friday 2 April 2004, to discuss the introduction of kahawai into the Quota Management System. We walked into the meeting feeling we had extremely strong points to make.

The Ministry made it abundantly clear that as far as they are concerned –

there is no scarcity of kahawai

there are no problems caused by purse seine fishing

It is hard to believe the sort of thinking that suggests that purse seining had been good for this fishery. We've got news for them.

It appears to us MFish are going to write off our concerns about the decline in kahawai schools as anecdotal. Why are they anecdote? Because the Ministry has not conducted the science to prove one way or the other whether what we are saying is true or not. This means that anecdote is all we have. The reason for this is that the Ministry is either too tight-fisted or too worried about the outcome if they go and investigate our claims. We now have the Ministry openly declaring they do not believe us.

Even if they did believe us, they –

do not accept there is any scarcity of kahawai

conveniently forget they had to massively reduce the commercial catch limits in the 1990s out of concern for plummeting non commercial catches and the disappearance of surface schools

fail to admit the fishery has not rebuilt since the 1990s and catch rates continue to decline, as has the size of the fish and the number of schools

do not accept there has been an adverse impact on seabirds, kingfish and other dependant species.

If the Ministry won't listen to and address our concerns then it is clearly becoming a political decision. Our concerns are being ignored and put down as being in the imaginations of the non-commercial fishers. We need to straighten up the play. **We need you to tell the Minister of Fisheries your concerns directly.**

The kahawai fishery may eventually be reduced to half of the current low level. If we allow this fishery to be managed at maximum sustainable yield then a stock size of 20% of the unfished stock will be their management target.

If you wish to know more about how this fishery is to be managed under the Ministry's proposal, then please [click here](#)

Ministry are

- not talking about rebuilding the fishery

- not talking about leaving it where it currently is

- continuing to allow the stock to be fished down, lower than it already is

- continuing to aggravate the conflict between non commercial and commercial fishers

- ignoring a highly valued recreational fishery by supporting a low value purse seine fishery

- not meeting their obligations by not having an agreed harvest strategy explaining their objectives for the kahawai fishery.

We get the strong impression this is all about putting kahawai into the Quota Management System and then letting the stakeholders fight it out downstream so the Crown can -

- avoid allocation scandals such as we have seen with scampi

- escape compensation issues by over allocating kahawai to the commercial sector

- avoid having to make management decisions.

It is clear this is a contentious issue. It would appear that the path of least resistance for the Ministry is to add up current utilisation (what we are all catching) and call that sustainable for expediency, regardless of the impact on all non-commercial fishers. This will also leave the public battling with a \$1.5 billion fishing industry for a fair non-commercial share after they have been issued their quota property rights.

Politicians have, in the past, acknowledged the issues in the kahawai fishery. Jeanette Fitzsimons of the Greens has previously said that kahawai should be made a *recreational only* species. Why would she say this if she weren't aware of public concerns? We need to support politicians from any party who support us. If you want to thank Jeanette for her stance on kahawai and encourage her to continue [click here](#).

option4's position is clearly stated in our submission. Commercial fishers should be able to land kahawai caught as a genuine bycatch and have quota available to cover those landings. It is the industrial fishing method using spotter planes and purse seine vessels to target whole schools that has done the damage. option4 is clear, the catch taken by this method must be discounted from the commercial catch history. Only this will prevent excessive quota being given as a reward to those who have seriously damaged this fishery.

Our arguments are sound, we will lose only if you do nothing.

You've got to make these arguments to the politicians and fisheries managers.

[Have your say - Click here now!](#)

APPENDIX 3

TAKEN

Your Kahawai are being caught by commercial fishers

And they are not giving them back

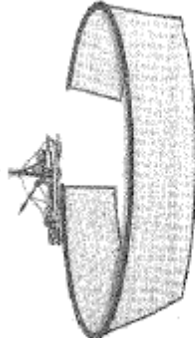
In fact fishing companies are demanding an increased commercial kahawai catch when this species goes on quota

Prepared by the New Zealand Big Game Fishing Council on behalf of the New Zealand Public

The public should not have to accept the leftovers after the commercial fleet have decimated kahawai schools using spottier planes and purse seine vessels

If you have noticed a decline in the kahawai schools on your coast, we think it is time for you to tell someone about it.

Act now to bring back our kahawai log on to www.option4.co.nz and click on Alert #5 or cut out this advert and post to Minister of Fisheries, Parliament House, Wellington. No stamp required.



Dear minister, I support the option 4 / NZBGFC submission and ask you to as well. Save the kahawai for the people of New Zealand by not wasting them on low value marginal commercial operations.

Name

Address

Town

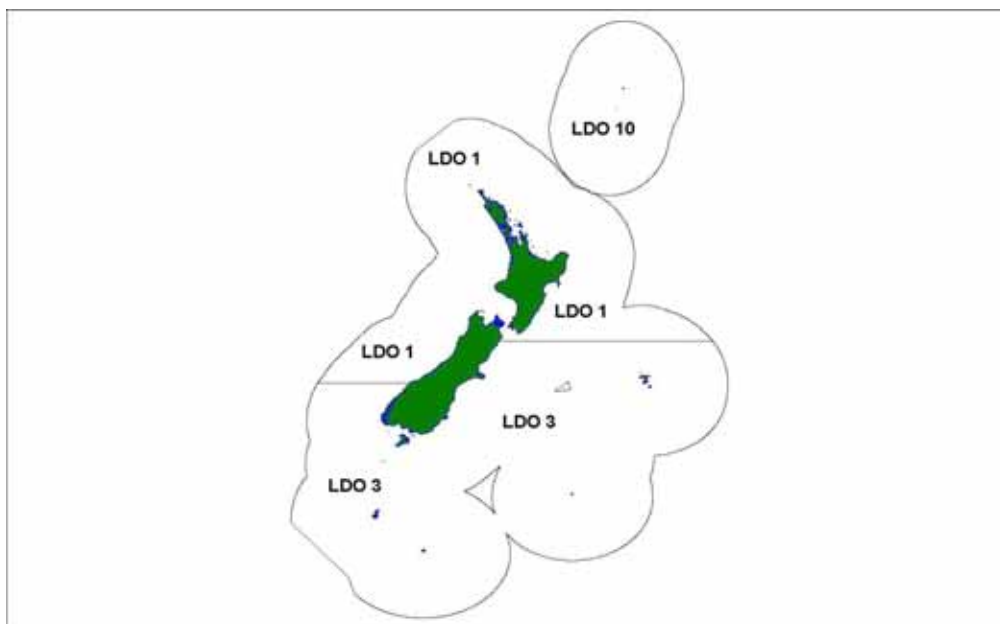
1 668 of the above form petitions were received by 24 June 2004 supporting the option 4 / NZBGFC submissions on kahawai

LOOKDOWN DORY (LDO) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Lookdown dory (*Cyttus traversi*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Areas (QMAs) for lookdown dory are shown in Figure 1. The fishing year for lookdown dory will be from 1 October to 30 September, and Total Allowable Commercial Catches (TACCs) and Annual Catch Entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1 **Quota Management Areas for lookdown dory**



Key Issues to be Considered

- 2 The key issues to be considered for lookdown dory are as follows:
 - a) Lookdown dory catches have been increasing, on average, since the 1989-90 fishing year. In the three FMAs that support the greatest catches, significant catch increases have been reported in the past three years;
 - b) Lookdown dory catch is mostly taken as a bycatch in trawl shots targeting hoki;
 - c) Relative biomass estimates for lookdown dory over the Chatham Rise have been increasing since 1997;
 - d) MFish is unaware of any immediate sustainability concerns for lookdown dory, but considers there may be risks to the fishery if catch levels increase. These risks are primarily associated with recruitment overfishing (taking females before they have a chance to reproduce) and excessive fishing pressure on a long-lived species; and

- e) There is evidence that some development has occurred in the fishery within the constraints of the current management framework. This evidence includes:
 - i) a low discard rate of lockdown dory bycatch from the target hoki fishery, ii) a relatively high proportion of dressed product form reported from catch landing returns, and iii) a number of commercial companies presently advertise the availability of lockdown dory.

Management Proposal

- 3 The proposed TACs, TACCs, and allowances for lockdown dory are presented in Table 1.

Table 1: Proposed TACs, TACCs and allowances for lockdown dory (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
LDO 1 (FMAs 1, 2, 7-9)	168	0	0	0	168
LDO 3 (FMAs 3, 4, 5, 6)	614	0	0	0	614
LDO 10 (FMA 10)	1	0	0	0	1

- 4 It is also proposed to:
 - a) Amend the reporting regulations to ensure the appropriate fishstock codes for lockdown dory are used to report commercial catches.
 - b) Set an interim deemed value of \$0.36 per kg and an annual deemed value of \$0.72 per kg for the 2004-05 fishing year.

TACs

TAC Management Strategy

- 5 MFish proposes to set TACs for lockdown dory stocks under s 13 of the Fisheries Act 1996 (the Act).
- 6 As an alternative to setting a TAC under s 13, the Act allows TACs to be set under s 14 if the stock is listed on the Third Schedule. By Order in Council, the Governor-General may add to that Schedule the name of any stock provided one of the three criteria specified in s 14(8) applies to that stock. However, MFish does not consider that any of the criteria specified are applicable to lockdown dory. Firstly, a maximum sustainable yield (MSY) could be estimated for lockdown dory stocks. Secondly, a catch limit for New Zealand has not been determined as part of an international agreement. And finally, there is currently insufficient rationale to support the management of lockdown dory on a rotational or enhanced basis.
- 7 Section 14B of the 1996 Act provides a further fishstock management option for setting a TAC. This provision enables the Minister to set a TAC that maintains the stock at a level that ensures its long-term viability, while other inter-related stocks can be taken at the TAC levels set for those stocks based on the biomass that supports the maximum sustainable yield (B_{MSY}). MFish considers that there is an absence of information to support such a management strategy for lockdown dory.

Rationale for Proposed TACs

- 8 Before setting (or varying) any sustainability measure (which includes a TAC), the Minister must consider a range of factors as outlined under the Statutory Considerations sub-heading.
- 9 Lookdown dory is an offshore demersal species caught mainly as bycatch in the hoki fishery, and in smaller amounts in the scampi, ling, arrow squid, hake, jack mackerel and barracouta fisheries. However, reports indicate that lookdown dory catch is sporadic and that it may be a difficult species to target.
- 10 Stock assessment information is not available for lookdown dory and it is not known whether stocks are at, above, or below B_{MSY} . However, catches of lookdown dory in the FMAs where lookdown dory is most abundantly caught (FMAs 3, 4 & 7) have been increasing, on average, since 1989 (refer Table 2). In other FMAs, catches have remained stable (FMAs 1, 2, 8 & 9) or have also increased (FMAs 5 & 6). In addition, relative biomass estimates for lookdown dory calculated from trawl surveys over the Chatham Rise (the largest lookdown dory fishery) have been increasing since 1997. Additional information on the catch history of lookdown dory is included in Annex One.

Table 2: Reported landings (rounded to nearest tonne) of lookdown dory by FMA and fishing year 1989–90 to 2002–2003.

Year	FMA 1	FMA 2	FMA 3	FMA 4	FMA 5	FMA 6	FMA 7	FMA 8	FMA 9	FMA 10
1989/90	2	1	40	20	12	2	51	-	-	-
1990/91	3	4	46	59	10	11	33	<1	-	-
1991/92	1	2	96	75	17	3	55	-	-	-
1992/93	1	4	63	112	10	2	83	-	-	-
1993/94	<1	2	62	50	4	3	67	-	<1	-
1994/95	1	6	73	108	7	3	85	-	<1	-
1995/96	2	4	99	78	11	3	62	-	<1	-
1996/97	7	10	108	110	11	7	100	<1	<1	-
1997/98	5	8	159	272	11	25	82	-	<1	-
1998/99	3	3	140	303	11	10	154	-	<1	-
1999/00	3	5	161	295	21	17	124	<1	10	-
2000/01	2	6	203	318	24	25	111	<1	4	-
2001/02	10	10	181	331	26	28	170	3	2	-
2002/03	8	8	261	365	48	32	167	1	2	-

- 11 Increased lookdown dory catch may be an artifact of increased catch and targeting of hoki, however, the recent catch history and relative biomass estimates (for the Chatham Rise) suggest existing catches are at sustainable levels. There are no immediate sustainability concerns for lookdown dory stocks.
- 12 In the absence of a comprehensive stock assessment, MFish proposes to set TACs for each lookdown dory stock that reflect recent catch from each fishery. While there may be potential for further development of the fishery (in terms of increased catch limits), the level of utilisation must be balanced against sustainability risks related to the biology of lookdown dory, the fishery interaction with target stocks, and the fact that little is known about the species.

- 13 There is evidence to suggest that some development in the lockdown dory fishery has occurred within the constraints of current non-QMS management framework. Based on analysis of observer records between 1990 and 2001, 93% of lockdown dory bycatch from the target hoki fishery was kept, rather than discarded. According to 2001–02 catch landing returns, about 78% of lockdown dory catch (greenweight) is categorised as dressed processed state and 14% as meal. The remainder is unspecified greenweight catch. The high proportion of dressed product form suggests that a market already exists for the majority of lockdown dory catch. Indeed a number of commercial companies presently advertise availability of lockdown dory. Combined with recently increasing catches, this suggests that there is future development potential in the lockdown fishery, provided additional stock assessment information supports this approach.
- 14 Given the recent catch history and apparent development potential, it is considered appropriate to set catch limits that reflect the fact that higher catches have come from the fishery in recent years. Catch limits greater than recent averages are not proposed because of the need to balance utilisation against potential sustainability risks under increasing catch levels (given little is known about lockdown dory). Furthermore, catch limits set at recent levels will avoid lockdown dory constraining the target hoki fishery.
- 15 Preliminary examinations of otoliths of lockdown dory from Australia suggest this species may live to over 30 years. Preliminary evidence also suggests that around the North Island, female lockdown dory mature at 35cm. In view of these biological characteristics, there may be sustainability risks to the fishery if catch levels increase. These risks are primarily associated with recruitment overfishing (taking females before they have a chance to reproduce) and excessive fishing pressure on a long-lived species. Both observer data from commercial trawls and data from trawl surveys shows that catches include immature fish. Additional information on the biology of lockdown dory is included in Annex One.
- 16 The proposed TACs recognise that it is likely lockdown dory will continue to be caught mainly as bycatch in the hoki fishery. The amount of lockdown dory caught will be mostly dependent on the catch limits set for hoki. Recent evidence suggests there are sustainability concerns for the western hoki stocks, and for the 2002-03 fishing year the TACC was decreased by 20 000 tonnes. However, because of an adjustment in the catch split arrangements, the decrease in the catch limit does not apply to the eastern stock. Hence, no change in fishing pressure on the eastern stock is anticipated. MFish therefore considers that the management proposal for lockdown dory reflects the present fishing interaction between hoki and lockdown dory.
- 17 The proposed TACs reflect the modest lockdown dory bycatch in other fisheries. MFish does not consider that there is any substantive lockdown dory discard from these smaller target fisheries and hence there is no need to include a nominal amount to account for discard within the TAC/TACC.
- 18 Trawling can have adverse effects on the aquatic environment by indiscriminately catching a wide range of species and by disturbing the benthic environment. However, under the TAC levels proposed, the effects of the lockdown dory fishery on the aquatic environment are likely to remain unchanged. The effects of trawling will be largely dependent on the effort in associated target fisheries.

LDO 1

- 19 LDO 1 (including FMAs 1, 2, 7-9) encompasses the lockdown dory fishery on the west coast (FMA 7) where 82% of the catch between 1988-89 and 2001-02 was bycatch from the hoki fishery. The average yearly catch in FMA 7 between 1989 and 1998 was 69 tonnes. This has increased to an average yearly catch of 145 tonnes since the 1998-99 fishing year. Catches in FMAs 1 and 2 have been relatively stable since 1989, reaching highs of 10 tonnes in each FMA for the 2001-02 fishing year. Comparatively smaller amounts are taken from FMAs 8 and 9.
- 20 MFish proposes that the TAC for LDO 1 be set at 168 tonnes. The proposed TAC is based on the average reported commercial catches over the past three years (2000-01 to 2002-03) and provides for the increased catches while recognising potential sustainability risks beyond those levels.

LDO 3

- 21 LDO 3 (including FMAs 3, 4, 5 and 6) encompasses the lockdown dory fishery over the Chatham Rise (FMAs 3 and 4) where between 84% and 87% of the catch between 1988-89 and 2001-02 was bycatch from the hoki fishery. The average yearly catch in FMA 3 between 1989-90 and 1999-00 was 95 tonnes, although catches were significantly higher in the latter years. The average yearly catch in FMA 4 between 1989-90 and 1999-00 was 135 tonnes, although catches were significantly higher in the latter years. Catches have increased significantly in the past three fishing years in both FMAs, averaging 215 tonnes in FMA 3 and 338 tonnes in FMA 4. Smaller catches are recorded from FMAs 5 and 6, although in the past three years catches have increased on average to 33 and 29 tonnes (respectively) from previous annual catches averaging 11 and 8 tonnes (respectively).
- 22 MFish proposes that the TAC for LDO 3 be set at 614 tonnes. The proposed TAC is based on the average reported commercial catches over the past three years (2000-01 to 2002-03) and provides for the increased catches while recognising potential sustainability risks beyond those levels.

LDO 10

- 23 MFish proposes to set the TAC at a nominal one tonne. No catches have been reported from the Kermadec Fisheries Management Area and there is no information to suggest that a potential fishery exists outside the 12 nautical mile marine reserve around the Kermadec Islands. Those fisheries that take lockdown dory as bycatch, including hoki, hake, ling, barracouta, jack mackerel and arrow squid, have a TACC of 10 tonnes in FMA 10, but reported commercial catches are consistently low and most often no catches are reported. The proposed nominal one tonne limit for lockdown dory is intended to cover bycatch in any deepwater fishery that may develop.

Allocation of TAC

- 24 MFish proposes that allowances for non-commercial interests are set at zero tonnes and the TACC is set at the level of the TAC.

Recreational and Customary allowance

- 25 There is no quantitative information on recreational and customary harvest levels of lookdown dory. Due to the offshore location and depth distribution of this species, non-commercial catch is likely to be negligible.
- 26 When considering the allowance for recreational interests in each of the lookdown dory fishstocks, under s 21(5) of the Act, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made pursuant to his or her recommendation under s 311 of the Act. No such regulations have been made.
- 27 In considering the proposed allowances for customary non-commercial interests, the Minister is required to take into account any mātaimai reserve or s 186A closure in the relevant QMA (under s 21(4) of the Act). MFish does not consider that the zero allowance proposed for customary catches will detract from the intent of any mātaimai or s 186A closure presently in place.

Allowance for other sources of mortality

- 28 MFish does not consider that there will be significant discard and non-reporting of lookdown dory upon its introduction into the QMS. Observer records collected between 1990 and 2001 indicate that 93% of lookdown dory bycatch from the target hoki fishery was kept, rather than discarded. Furthermore, a relatively high proportion of lookdown dory is reported as dressed product in catch landing returns. This indicates that, despite being a bycatch species, lookdown dory has economic value and is not often discarded.
- 29 There has been no assessment of incidental gear mortality. In the hoki fishery (the main target fishery in which lookdown dory is taken), net damaged fish have been recorded. However, the extent of damage and resulting mortality is unknown, and no allowance is made for other sources of fishing related mortality in the allocation of the TAC for hoki.
- 30 MFish also proposes to set 'other sources of fishing-related mortality' for lookdown dory at zero tonnes.

TACC

- 31 MFish proposes that TACCs be set at the estimated commercial catch levels used to determine the TACs, as described above and shown in Table 1.
- 32 MFish proposes to set the TACC at 168 tonnes for LDO 1 based on the average annual catches over the past three years (up to and including 2002-03). These three years represent a period of significantly higher catches.
- 33 A TACC of 614 tonnes is proposed for LDO 3 based on the same three year period, again to reflect a period of higher catches. The proposed LDO 3 TACC is also supported by relative biomass indices over the Chatham Rise that have been increasing for lookdown dory since 1997.

- 34 A TACC of 1 tonne is proposed for LDO 10. This nominal amount is intended to cover occasional bycatch of lookdown dory in associated target fisheries.

Consequential amendment to regulations

- 35 As a consequence of introducing lookdown dory into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the appropriate fishstock codes are used to report commercial catches.
- 36 Details of the proposed amendments are set out in a generic section of this paper.

Deemed value and overfishing threshold

- 37 The proposed deemed value is set on the basis that that lookdown dory is included within the low knowledge fishstock category.
- 38 MFish proposes to set an interim deemed value at \$0.36 per kg and an annual deemed value of \$0.72 per kg for lookdown dory for the 2004-05 fishing year. The deemed value is set using a port price of \$1.20 per kg (based on the early 2003 port price survey).
- 39 Consistent with the framework for low knowledge fishstocks, MFish does not propose to set overfishing thresholds or tolerances for lookdown dory stocks.

Statutory Considerations

- 40 In forming the management options for lookdown dory, the following statutory considerations have been taken into account:
- a) The purpose of the Act (as provided in s 8) is to provide for the utilisation of fisheries resources while ensuring sustainability. The management options seek to ensure sustainability of the fishstocks by setting TACs and other appropriate measures, including deemed values. Utilisation is provided by including lookdown dory in the QMS framework and setting an allowance for the commercial sector in the form of a TACC;
 - b) The TAC under s 13 of the Act should be set to move the stock towards a level that can produce the MSY (s 13(2)(b)). There is no fishery independent stock assessment information to assess where each stock is at in relation to MSY at this time. However, the proposed TACs are based on reported commercial catch levels, which have been, on average, increasing over the last three years. MFish is not aware of any sustainability concerns under recent catch levels;
 - c) The proposed TAC options are also based on:
 - i) No specific environmental conditions affecting the stock have been identified (as required to be considered under s 13(2)(b)(ii));
 - ii) Relevant biological characteristics have been considered in setting the management proposal for lookdown dory (as required to be considered under s 13(2)(b)(ii)). There is some preliminary evidence to suggest that lookdown dory is a long-lived species and that catches include fish

that have not yet matured. These biological attributes suggest this species is vulnerable to the effects of fishing; and

- iii) Section 13(2)(b)(i) requires that the interdependence of stocks to be had regard to. MFish considers that the management proposal for lockdown dory reflects the fishing interaction between hoki and lockdown dory. Based on the most recent information on hoki stocks, MFish does not consider that the lockdown dory management proposal will restrict the hoki fishery.
- d) Section 9(a) requires the maintenance of associated or dependent species above a level that ensures their long-term viability should be considered. Lookdown dory are likely to be prey of larger fish species and are known to prey on crustaceans and small fish. However, there is no specific information to indicate that these interactions should influence sustainability measures set under Part III of the Act;
- e) There is likely to be economic effects associated with the proposed TACs, although the precise nature of these effects cannot be quantified. The most obvious effect will be on hoki fishers required to cover their lockdown dory bycatch with ACE or pay a deemed value. The availability of ACE is determined by the extent of the proposed TACCs. If the TACC is too low, then there could be an unwarranted economic effect on the associated target fisheries because commercial fishers may have insufficient ACE to cover catch. Given that the proposed lockdown dory TACCs are based on recently increased catches, it is unlikely that overfishing thresholds will be invoked. MFish is not aware of any social or cultural factors that would influence the management proposal presented in this paper;
- f) There is little information about the natural variability of lockdown dory stocks. However, as noted earlier, the relative biomass of lockdown dory on the Chatham Rise appears to be increasing, despite escalating catch levels;
- g) Section 9(b) requires that the maintenance of biological diversity be taken into account. Lookdown dory is principally caught as bycatch in the hoki trawl fishery. This method can have adverse effects on the aquatic environment. Trawling can potentially impact on species diversity by indiscriminately catching a wide range of species. Trawling can also result in the destruction of the benthos. However, it is expected that the effects of the lockdown dory fishery on the aquatic environment are likely to remain unchanged under the proposed TAC levels. The level of trawling will be largely determined by the target fisheries in which lockdown dory is taken as bycatch;
- h) Section 9(c) requires consideration of the protection of habitat of particular significance to fisheries management. No habitats of particular significance to fisheries management that would be impacted on by the harvesting of lockdown dory are known. Any significant environmental issues linked to the trawl fishery taking lockdown dory as a bycatch should be addressed primarily in the management arrangements for the target fishery. The effects of the lockdown dory fishery on the aquatic environment are likely to remain unchanged under the proposed TACs. Given the bycatch nature of the lockdown dory fishery, it is not anticipated that setting TACs for lockdown dory will result in new areas being fished;

- i) Section 11(2A)(a) requires that the Minister must take into account any conservation services or fishery services. MFish is unaware of any relevant services that would influence the lockdown dory management proposal. In addition (as per s 11(2A)(c)) no decision has been made not to require a service in this fishery;
- j) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks, and maintaining biodiversity). There are no international obligations specific to lockdown dory. MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management proposal for lockdown dory. Specifically, there is no need to adjust the existing regulatory framework to accommodate lockdown dory in the QMS;
- k) Section 11(1)(b) provides that the Minister may take into account existing controls under the Act when setting or varying a sustainability measure such as a TAC. Lookdown dory is currently managed outside the QMS. On 1 October 2004, this species will be managed under the QMS framework, and TACs, TACCs, and allowances will be set for the various fishstocks. No minimum size limit currently applies. The regulatory framework for commercial fishing specifies a minimum mesh size of 100mm for nets used to fish for species with an unspecified minimum net mesh size. There is no mesh size specified for lockdown dory so a minimum 100mm mesh size applies. MFish considers that there is no need to change this upon introducing lockdown dory to the QMS;
- l) No fisheries plan exists or is proposed that would otherwise need to be taken into account when setting the TACs for the lockdown fishstocks;
- m) MFish is unaware of any considerations in any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to setting TACs for lockdown dory at this time;
- n) Section 11(2)(c) requires that the Minister shall have regard to any provisions of ss 7 and 8 of the Hauraki Gulf Marine Park Act 2000. However, it is unlikely that any lockdown dory will be taken from the Park;
- o) The nature of the fishery and interests of the respective fishing sectors have been considered in setting the TAC, TACC, and allowances for customary and recreational interests and all other mortality to the stock caused by fishing; and
- p) The best available information on the status of lockdown dory is derived from a report prepared by NIWA under contract to MFish. There is no other stock assessment information on this species, other than generalised descriptions of its biology and distribution. Information on relative biomass, discard rates and reported processed state has been taken from Fisheries Assessment Reports. In accordance with s 10 of the Fisheries Act, the absence of, or uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

Preliminary Recommendations

41 MFish recommends that the Minister:

- a) **Agrees** to set a TAC of 168 tonnes for LDO 1, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 168 tonnes.
- b) **Agrees** to set a TAC of 614 tonnes for LDO 3, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 614 tonnes.
- c) **Agrees** to set a TAC of 1 tonne for LDO 10, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 1 tonne.
- d) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to prescribe a code for lockdown dory to be used by fishers when completing their statutory catch returns.
- e) **Agrees** to set an interim deemed value of \$0.36 per kg and an annual deemed value of \$0.72 per kg for the 2004-05 fishing year.

ANNEX ONE

Species Information

Biological Information

- 42 Lookdown dory (*Cyttus traversi*) is an offshore demersal species distributed widely in New Zealand waters. It is one of the less abundant members of a loosely associated group of about 23 common species, which together form the 'upper slope assemblage' of New Zealand's continental shelf. The main species in this group are hoki, javelin fish, ling, pale ghost shark, sea perch, hake, and longnose spookfish. These species co-exist in time and space, but may not necessarily interact. Lookdown dory is also present in Australian waters, mostly east and south of Tasmania, where it are known as king dory, and also in South Africa.
- 43 Juveniles are pelagic in surface waters up to a length of approximately 12 cm, at which stage a metamorphosis is observed, associated with the transition from a pelagic to a demersal habitat. Adults are most common between 400 to 600 m, but have a wide depth range, from 50 to 1 200 m. The main prey of lookdown dory are natant decapod crustaceans, followed by euphausid, mysid, galatheid, and nephropsid crustaceans, and fish. Lookdown dory is likely to be prey of larger fish in their habitat and have occasionally been recorded in the stomachs of large ling. There are no published studies of age and growth of this species.
- 44 Lookdown dory, *Cyttus traversi*, belongs to the family Zeidae. This family includes 13 species in seven genera distributed among the Atlantic and Pacific oceans and the Mediterranean Sea.

Fishery Characteristics

Commercial catch

- 45 Lookdown dory is generally caught by bottom trawling in depths of 200 to 800 m as a bycatch in a range of fisheries including hoki, barracouta, hake, ling, scampi, and jack mackerel.
- 46 Total landings (CLR) have increased steadily from 127 tonnes in 1989-90 to 892 tonnes in 2002-03, and most of the catch has come from FMAs 3, 4, and 7 (refer Table 3). However, only a small fraction of the estimated catches of lookdown dory are from tows targeting this species (mostly in FMA 7) (refer Table 4).
- 47 In all FMAs where lookdown dory are commonly caught, the greatest percentage of the catch comes as bycatch from tows targeting hoki (refer Table 4). For all fishing years and FMAs combined, 83% of lookdown dory catches have been bycatch in the hoki fishery, with other fisheries (barracouta 4%, hake 3%, ling 2%, scampi 2%) catching a smaller fraction.

Table 3: Reported landings (rounded to nearest tonne) of lockdown dory by FMA and fishing year 1989–90 to 2002–2003. FMAs in italics combine to LDO 3. Non-italics combine to LDO 1 (FMA 10 = LDO 10).

Year	FMA 1	FMA 2	FMA 3	FMA 4	FMA 5	FMA 6	FMA 7	FMA 8	FMA 9	FMA 10
1989/90	2	1	40	20	12	2	51	-	-	-
1990/91	3	4	46	59	10	11	33	<1	-	-
1991/92	1	2	96	75	17	3	55	-	-	-
1992/93	1	4	63	112	10	2	83	-	-	-
1993/94	<1	2	62	50	4	3	67	-	<1	-
1994/95	1	6	73	108	7	3	85	-	<1	-
1995/96	2	4	99	78	11	3	62	-	<1	-
1996/97	7	10	108	110	11	7	100	<1	<1	-
1997/98	5	8	159	272	11	25	82	-	<1	-
1998/99	3	3	140	303	11	10	154	-	<1	-
1999/00	3	5	161	295	21	17	124	<1	10	-
2000/01	2	6	203	318	24	25	111	<1	4	-
2001/02	10	10	181	331	26	28	170	3	2	-
2002/03	8	8	261	365	48	32	167	1	2	-

Table 4: Percentage of lockdown dory estimated catch by target fishery for all fishing years 1989–90 to 2001–02.

FMA	Lookdown dory	Target Species						
		Hoki	Scampi	Ling	Arrow squid	Hake	Jack Mackerel	Gemfish
1	12	56	18	-	-	-	-	-
2	-	35	35	16	-	-	-	-
3	-	87	-	-	-	-	-	-
4	-	85	-	-	-	-	-	-
5	-	59	-	11	12	-	-	-
6	-	71	12	15	-	-	-	-
7	7	82	-	-	-	-	-	-
8	-	-	-	-	14	57	29	-

Non-commercial catch

- 48 There is no quantitative information on customary or recreational harvest levels of lockdown dory. Due to the offshore location and depth distribution of lockdown dory, non-commercial catch will be negligible.

Regulatory Framework

- 49 There are no existing regulations that specify catch limits (commercial or amateur) or other sustainability measures for lockdown dory, and there is no minimum size limit for amateur or commercial fishers. There is a generic input control specifying that the mesh size of nets must not be smaller than 100mm.

Fishery Assessment

- 50 There has been no scientific assessment of the maximum sustainable yield for lockdown dory stocks. Relative biomass estimates have been calculated from data

collected from periodic trawl surveys over the Chatham Rise. These estimates have been increasing in recent years.

Environmental Issues

- 51 Environmental issues in relation to the lockdown dory fishery are discussed in the main section.

Current and Potential Research

- 52 There has been no directed fisheries research specifically on lockdown dory. However, an investigation of lockdown dory age and growth is planned for the 2004–05 fishing year.

Social, economic, or cultural factors

- 53 MFish is not aware of any information on particular social, economic, or cultural matters that could influence the setting of TACs and TACCs for lockdown dory beyond those considered in the main section.

LOOKDOWN DORY (LDO) – FINAL ADVICE

Initial proposal

- 1 MFish proposed to set and allocate the TAC for each lockdown dory (*Cyttus traversi*) stock as outlined in Table 1.

Table 1: Proposed TACs and allowances for lockdown dory stocks (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
LDO 1 (FMAs 1, 2, 7-9)	168	0	0	0	168
LDO 3 (FMAs 3, 4, 5, 6)	614	0	0	0	614
LDO 10 (FMA 10)	1	0	0	0	1

- 2 MFish also proposed to amend Part 1 of Schedule 3 of the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for lockdown dory to be used by fishers when completing their statutory catch returns, and to set an interim deemed value of \$0.36 per kg and an annual deemed value of \$0.72 per kg for the 2004-05 fishing year.

Biological and fishery information

Submissions

- 3 No submissions were received on biological and fishery information for lockdown dory.

TACs and allowance setting considerations

Submissions

- 4 **Te Ohu Kai Moana** (TOKM) agree with the MFish proposal to base each LDO TAC on average commercial catches over the last three years with some recognition of the scope for limited catch expansion.
- 5 TOKM also agree with MFish that there is no need to include lockdown dory on the Third Schedule of the Fisheries Act 1996 (the Act).

Social, cultural and economic factors

Submissions

- 6 **Sealord** do not believe that lockdown dory should be introduced into the QMS because current catches are unlikely to be having adverse effects on the species, and because fishers will be required to purchase quota for a low value species simply to maintain current target fishing operations. Sealord argues this comes at a time when industry is suffering severe financial conditions.

- 7 If lockdown dory is introduced into the QMS, Sealord believe individual transferable quota (ITQ) should be allocated on the basis of catch history over recent years.
- 8 Sealord considers that the Crown will receive most of the lockdown dory quota shares and then tender them out to the highest bidder. Therefore Sealord considers the introduction of lockdown dory into the QMS is primarily a revenue gathering exercise for the Crown.

MFish discussion

- 9 MFish acknowledges that current catches are unlikely to be having an adverse effect on lockdown dory. However, for the purposes of this discussion, MFish does not propose to revisit in detail the rationale that supported the then Minister of Fisheries' decision to introduce lockdown dory into the QMS¹. Briefly, MFish anticipated that the removal of the permit moratorium could lead to increased targeting of lockdown dory. The risk of sustainability issues developing for lockdown dory in this scenario are probably increased because of relevant biological characteristics. Further development of the fishery would best be fostered within an environment where potential risks to sustainability can be actively managed. Sealord had the opportunity to submit on this proposal during the consultation period, but did not do so.
- 10 MFish is unaware of any special circumstances related to the lockdown dory fishery that justifies changing the statutory catch history years used to generate ITQ for fishers. The Fisheries Bill 1996 removed any provision for considering 'commitment and dependence' when determining quota allocations. It is Government policy that, when allocating quota, the circumstances of individual fishers is not a relevant consideration.

Environmental considerations

Submissions

- 11 No submissions were received on environmental considerations for lockdown dory.

Other management measures

Submissions

- 12 **TOKM** consider that lockdown dory, and all other new species introduced into the QMS, should be included on the Fifth Schedule of the Act, but not the Sixth Schedule of the Act or Schedule 5A².

¹ The Declaration of Introduction for lockdown dory was gazetted on 16 October 2003 after the Minister agreed the LDO stocks should be managed within the QMS

² Fishers are prohibited from owning more than 45% of the total allowable commercial catch (all stocks combined) for species on the Fifth Schedule of the Act. The Sixth Schedule of the Act allows fishers to return fish to the sea in accordance with stated requirements. Schedule 5A includes stocks to which s 67A (allocation of additional catch entitlement in the case of under fishing) and s 340A (transitional provisions relating to under fishing) do not apply.

MFish discussion

- 13 MFish does not agree with TOKMs proposal to include all new species introduced into the QMS on the Fifth Schedule of the Act. The MFish response to this proposal is discussed in the general section of this document.
- 14 MFish agrees with TOKM that there is no need to include lockdown dory on the Sixth Schedule of the Act and notes that it had not proposed to do so.

Deemed values and overfishing thresholds

Submissions

- 15 **TOKM** support the classification of lockdown dory as a low knowledge species for deemed value purposes and agree with the MFish deemed value proposals.
- 16 **Sealord** believe the deemed value is too high for this 'bycatch species'. Sealord submit that although there may be a limited market for lockdown dory it is highly unlikely that \$720 per tonne (the proposed annual deemed value) could be achieved for 800 tonnes (approximately the proposed total TACC) of frozen at sea lockdown dory.

MFish discussion

- 17 Deemed values are initially set as a proportion of the value of the stock. The proposed deemed values for lockdown dory were calculated using the best available pricing information obtained from the interim results of the 2003 port price survey. The provisional port price for lockdown dory in that survey was \$1.20 per kg.
- 18 The final results of the 2003 port price survey have recently become available. The value of lockdown dory has decreased to approximately \$0.70 per kg. MFish proposes to adjust the recommended deemed values to reflect the most recent port price information. MFish now recommends that the interim deemed value be set at \$0.21 and the annual deemed value be set at \$0.42 per kg for the 2004-05 fishing year.
- 19 Lockdown dory is considered a 'low knowledge fishstock' for deemed value setting purposes. MFish considers that the proposed deemed values reflect the fact that there is little information on lockdown dory fishery status, and there are no sustainability concerns.
- 20 MFish notes that low knowledge fishstocks are to be reclassified into another category within five years or once MFish has more confidence in the TACC, whichever is sooner. Reclassification would likely alter the criteria used to set the deemed values.

Conclusion

- 21 MFish received two submissions on the proposed sustainability measures and management controls for lockdown dory. One submission supports the TACs, allowances and deemed values proposed for each stock but considers lockdown dory should be included on the Fifth Schedule of the Act.
- 22 The second submission does not support lockdown dory being introduced into the QMS at this time. The submission requests that the statutory catch history years (used

to allocate quota) are changed for lockdown dory if it is introduced. The same submission also considers that the proposed deemed values are too high.

- 23 MFish does not consider any issues arising from the submissions require changes to the proposals set out in the IPP. However, the proposed deemed values have been adjusted to reflect the most recent port price value for lockdown dory.
- 24 The proposed TACs and supporting measures provide an appropriate balance in allowing fishers to continue to utilise lockdown dory at recent catch levels, while ensuring sustainability. The need for any additional management measures will be revisited if explicit sustainability or utilisation issues are identified.

Final recommendation

25 MFish recommends that you:

- a) **Agree** to set a TAC of 168 tonnes for LDO 1, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 168 tonnes.
- b) **Agree** to set a TAC of 614 tonnes for LDO 3, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 614 tonnes.
- c) **Agree** to set a TAC of 1 tonne for LDO 10, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 1 tonne.
- d) **Agree** to amend Part 1 of Schedule 3 of the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for lockdown dory to be used by fishers when completing their statutory catch returns.
- e) **Agree** to set an interim deemed value of \$0.21 per kg and an annual deemed value of \$0.42 per kg for the 2004-05 fishing year.

MAKO SHARK (MAK) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Mako shark (*Isurus oxyrinchus*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Areas (QMAs) for mako shark is shown in Figure 1. The fishing year for mako shark will be from 1 October through to 30 September in the following year, and Total Allowable Commercial Catch (TACC) and Annual Catch Entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: Quota Management Areas for shortfin mako shark



Key Issues to be Considered

- 2 Mako shark is a highly migratory species. The degree to which populations of mako shark are resident within New Zealand fisheries waters is unknown.
- 3 Mako shark is an unavoidable bycatch in tuna longline fisheries, trawl and bottom longline fisheries. There are no target fisheries for mako shark in New Zealand, but the choice of fishing gear can influence the retention of sharks once caught (the use of steel traces).
- 4 Internationally, there is concern about increasing catches of sharks and the potential adverse effects on shark populations. The Food and Agriculture Organisation of the United Nations has coordinated the development of an International Plan of Action for Conservation and Management of Sharks (IPOA-Sharks) within the framework of the Code of Conduct for Responsible Fisheries.
- 5 Mako shark has been listed on the IUCN 2000 Red List as a low risk Near Threatened¹ species in the South-eastern Pacific.

¹ A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically

- 6 Mako shark is highly valued by recreational fishers as a significant big game sports fish.

List of Management Options

- 7 It is proposed to include mako shark on the Third Schedule to the 1996 Act, as a species for which it is not possible to estimate MSY, because of the biological characteristics of the species.
- 8 It is proposed to set a TAC pursuant to s 14 of the 1996 Act as MFish considers that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2).
- 9 The MFish proposal for the mako shark (MAK 1) TAC, other allowances and TACC (in tonnes) is outlined in Table 1.

Table 1: Proposed TACs, TACCs, and allowances for mako shark (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
MAK 1	506	10	50	46	400

- 10 MFish also proposes the following additional management controls:
- Inclusion of mako shark as a sixth schedule stock that may be returned to the sea or other waters in accordance with stated requirements;
 - A review of the conversion factor for mako shark;
 - Consequential amendments to the reporting regulations; and
 - Set a deemed value for mako shark but no overfishing threshold.

TACs

TAC management strategy

- 11 Section 14 of the 1996 Act provides an exception to setting a TAC based on an assessment of MSY where the Minister is satisfied that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2). It is not possible to estimate MSY for the part of the mako shark stock that is found within New Zealand fisheries waters.
- 12 It is therefore proposed that TAC for mako shark are set pursuant to s 14 of the 1996 Act. While any TAC must be set in a way that ensures use of the stock is sustainable there is no requirement to take into account or be guided by the need to manage in accordance with MSY. A TAC set under s 14 of the Act must be set in a way that better achieves the purpose of the 1996 Act. MFish believes that a TAC set under the provisions of s 14 of the 1996 Act can better provide for utilisation (developing fisheries to enable people to provide for their social, economic and

Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters while ensuring sustainability.

- 13 Further, s 14 provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

Rationale for Proposed TAC

- 14 There have been no assessments of the potential yield of mako shark in New Zealand and information is not available to undertake such assessment. The information available to assess the sustainability of mako shark stock is limited to information on the biological and reproductive characteristics of the species and to catch information.
- 15 Mako shark is a highly migratory species of oceanic habit whose stock status is not known.
- 16 Within New Zealand, mako shark is an unavoidable bycatch, principally of the tuna longline fishery, but also associated with trawling and bottom longline fisheries. In recent times there has been indications of targeting oceanic sharks for the shark fin trade.
- 17 In the absence of estimates of sustainable catch a TAC based on estimates of current utilisation is proposed. This is problematic because of the reporting problems associated with the fishery. MFish has used the best available information on which to base estimates of commercial catch and applied a correction factor to account for known potential errors. An average of the most recent three years of commercial reported landings increased by a factor of 25% is used as an estimate of current commercial utilisation (400 tonnes). Non-commercial use and other sources of fishing mortality (106 tonnes combined) are assessed in order to determine a level of total current utilisation (506 tonnes). MFish considers that a TAC at this level is likely to be sustainable.
- 18 A further consideration has been whether there is further development potential in the fishery for mako shark. Current policy guidelines suggest that such potential should be assessed against the following factors:
- 19 **Sustainability of the stock**, within the effort put into the target fisheries of which mako shark is a bycatch, in comparison to the total international effort put into those fisheries, the New Zealand take of sharks is unlikely to be significant.
- 20 Compared with a wide range of shark species, the productivity of mako sharks is moderate because its relatively fast growth results in a moderate age at maturity. However, NIWA notes that the low fecundity of mako shark is cause for strong concern as the ability of the stock to replace sharks removed by fishing is limited. This is compounded by observer information which suggests that the majority of mako shark caught in tuna longline catches around the North Island is dominated by immature sharks of both sexes.
- 21 Commercial catch reporting of mako shark is considered inconsistent at best, while conversion factors may be inaccurate by as much as 100%. Consequently, little can be inferred from landing data, except that commercial catch and landings data in New

Zealand probably greatly underestimate actual catches of mako shark, mainly through non-reporting of discarded sharks and reporting of processed weight by tuna longline vessels which often keep only the fins.

- 22 In their s 18 IPP submission, the Northern Inshore Fisheries Company Ltd (NIFC) agrees that current catches and landings probably underestimate actual catch. It believes the increase in landings in recent years is a reflection of better reporting. NIFC notes that the under-utilisation of sharks is a reflection of the costs and difficulty associated with managing the shark flesh and the absence of a market for shark flesh, which makes mako shark a low value bycatch. It believes it is unlikely that mako shark target fisheries will develop in New Zealand.
- 23 NIWA concludes that reported landings of mako shark as a bycatch of tuna longlining, while fluctuating, show no increasing or decreasing trend. However, this trend should be viewed within the context of a significant increase in effort. The number of hooks set per year has increased from two to four million in the mid 1990s to eight to ten million at present. The number of surface longline vessels has increased from 43 in 1990-91 to 133 in 2001-02. Improved reporting is thought responsible for recorded landings of mako shark as a bycatch of other fisheries having steadily increased since 1990.
- 24 New Zealand has obligations under international agreements, especially the Food and Agriculture Organisation of the United Nations International Plan of Action for Conservation and Management of Sharks (IPOA-Sharks), within the framework of the Code of Conduct for Responsible Fisheries. The objective of the IPOA is to ensure the conservation and management of sharks and their long-term sustainable use. Guiding principles for the Plan of Action are that states that contribute to fishing mortality on a species should participate in its management, the precautionary approach should be applied to ensure sustainable management, and that management objectives and strategies should recognise the nutritional and socio-economic aspects of shark fisheries.
- 25 The IPOA-Sharks is voluntary, but proposes that states should develop a national plan of action for the conservation and management of shark stocks if their vessels catch sharks in targeted or non-targeted fisheries. MFish is to engage in the development of a National Plan of Action for sharks (NPOA) that will help provide a coordinated response to shark management issues in New Zealand fisheries waters.
- 26 Mako shark has been listed on the IUCN 2000 Red List as a low risk Near Threatened species in the South-eastern Pacific.
- 27 While there is a general obligation to conserve and manage, there are no specific international obligations with regard to mako shark that require catch controls at this stage, although in the future it is possible that the Western and Central Pacific Fisheries Commission will adopt measures for this species.
- 28 Any overfishing of Mako shark, it being an apex predator, could result in changes to predator/prey relationships and community structure. Understanding of food web relationships is still at an early stage, but MFish considers that, if evidence emerges of impacts on biodiversity from harvesting of mako shark, this can be managed at that time based on international cooperation where appropriate.

- 29 It would be a concern if mako shark were to become a target fishery, hence, it is not anticipated that there is much room for development from an inevitable bycatch fishery. However, it is noted that sustainability measures for this species have the potential to constrain the target tuna longline fisheries.
- 30 **Biology of the stock and potential for local depletion**, for mako shark this risk is considered to be moderate
- 31 It is unlikely that New Zealand catches of mako shark influence the global sustainability for mako shark significantly, however, this does not preclude the possibility of local depletion issues. The New Zealand Big Game Fishing Council (NZBGFC) contends that club records indicate a disturbing trend in the recreational catch of mako shark, total reports dropping in 2000-01 to one quarter of the total reports in 1994-95. This is most notable in the number of mako sharks tagged and released, especially in the 20-60 kg weight range. NZBGFC submits that the commercial tuna long line fishery has had an adverse effect on the recreational catch of mako shark, particularly in the Gisborne and Napier areas.

Table 2: Combined mako shark catch by all NZBGFC affiliated clubs by season

Season	Number Weighed	Number tagged	Total
1994-95	288	1 405	1 693
1995-96	424	1 118	1 542
1996-97	352	898	1 250
1997-98	455	485	940
1998-99	320	709	1 029
1999-00	338	323	661
2000-01	255	277	532
2001-02	155	282	437

- 32 **Impacts of fishing on the aquatic environment including bycatch**, for mako shark this is a factor of moderate risk. Mako shark is taken in conjunction with other large tuna species including southern bluefin tuna and any increase in catch creates some risk that southern bluefin tuna may be caught over and above the catch limit set for this species. There is greater potential for the level of the TAC for mako shark to constrain the fishery for target tuna species. This is mitigated to a degree by the measure providing for the release of live mako sharks likely to survive. There is an unquantified risk to the viability of associated and dependent species, which is method, rather than species dependent.
- 33 **Socio economic and cultural issues**, there are clear benefits to the fishery if an expansion in catch can be realised and sustained. The fishery is shared with the recreational sector and there is already information to suggest that fishing is having an impact on their interests.
- 34 **Anecdotal information on abundance and size of likely habitat in the management area**, for mako shark the extent of the habitat within New Zealand fisheries waters is unknown. Anecdote focuses on the vulnerability of shark species to overfishing.

- 35 On balance the risks associated with an increase in catch of mako shark are considered to be high. MFish therefore proposes to set a TAC for mako shark based on a best estimate of current utilisation.

MAK 1

- 36 MFish proposes a TAC for MAK 1 of 506 tonnes.

Allocation of TAC

Recreational Allowance

- 37 MFish National Marine Recreational Fishing Surveys provide no quantitative estimates of the recreational catch of mako shark, however, mako shark is a known target species of recreational fishers.
- 38 Mako shark appears to be a significant recreational fishery, highly prized as a game fish. Several hundred mako sharks per year are reported landed by big game fishing clubs, but many more are tagged and released, or caught by fishers not belonging to one of these clubs.
- 39 MFish proposes that the Minister set an allowance for recreational fishers, as outlined in the Statutory Obligations and Policy Guidelines section. There are no estimates of recreational catch but, based on MFish's general understanding of the likely level of fishing activity of the recreational mako shark fishery, MFish proposes a nominal 50 tonne recreational allowance for MAK 1.
- 40 When considering the allowance for recreational interests in the mako shark fishstock, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made under s 311 of the 1996 Act. No such regulations have been made, and accordingly no adjustment to the proposed allowance needs to be considered on this basis.

Customary Māori Allowance

- 41 There is no indication of the importance of mako shark to customary Māori fisheries, however, shark in general are known to be important and within that category there must be a take of mako shark. Mako shark are a common target for recreational gamefishers. MFish does not consider that the level of customary Māori take is likely to be at or near that of the recreational fishery. Therefore, an allowance of 20% of the recreational allowance is proposed (10 tonnes).

Allowance for other sources of mortality

- 42 There is no information on the current level of illegal catch of mako shark, although it may occur to obtain shark fins. It is suggested that no allowance is made to cover illegal catch at this time.
- 43 Based on Observer information, NIWA estimates that a quarter of mako shark caught by tuna longliners are discarded. MFish considers that the same incentives will apply to other fisheries where mako shark is caught as an inevitable bycatch, a similar

proportion is discarded in these fisheries. It is also not unreasonable to assume mortality associated with the extensive tag and release programme undertaken by the big game sport fishing clubs. On the other hand, management of mako shark under the QMS is likely to promote more efficient use and better information from reporting, while providing for the release of live mako shark will also reduce unnecessary mortality. MFish considers it prudent at this stage of the development of the fishery to set an allowance for other sources of mortality of 10% of all other allocations (46 tonnes) for fish that are lost before landing on board the vessel or returned to the sea and subsequently die.

TACC

- 44 Reported landings of mako shark have increased significantly over the last ten years. However, it is generally considered that this increase represents more an improvement in reporting rather than an increase in catch. Nevertheless, MFish notes there has also been a significant increase in effort in the tuna longline fishery, of which mako shark is an inevitable bycatch. Despite the improved reporting, the reported landings of mako shark almost certainly under estimate catch, largely due to unrecorded discards.
- 45 A further difficulty with recorded landings has been the use of generic codes including *other sharks and dogs* (OSD), and *sharks* (SHA).
- 46 Also, based on information from international fisheries and data supplied by NIWA, MFish considers that the conversion factor used for mako shark (30 for fins), to be underestimating catch.
- 47 The IPP identified the Sixth Schedule of the Act as an option that would allow the sustainability of mako shark to be addressed, while ensuring that bycatch does not constrain target fisheries. Species included on the Sixth Schedule of the Act may be returned to the water subject to conditions that ensure that they are likely to survive release.
- 48 This option also anticipates some of the objections to the entry of mako shark into the QMS. For example, it addresses the concern raised in submissions regarding the danger of handling large sharks when QMS rules require all fish subject to quota be landed. This danger would be manageable if there were provision for the release of live sharks.
- 49 NZBGFC supports the inclusion of mako shark on to the sixth schedule, which would allow unwanted mako sharks to be released alive rather than requiring them to be landed.
- 50 The economic return from catching smaller sharks is also not as good with reduced meat recovery and lower prices for fins. Inclusion within the Sixth Schedule also enables the marginally economic smaller sharks to not have to be landed.
- 51 MFish notes the development component of the fishery associated with tuna longlining, but also notes the reports of declining local catches from recreational fishers, the biological vulnerability of the species and New Zealand's international obligations and responsibilities.

- 52 On this basis MFish considers that the TACC estimate be based on the average of the recorded landings of the last three completed fishing years with an increment of 25% to accommodate historical reporting anomalies. Typically a larger proportion of mako shark has been landed whole (compare this with blue shark which is primarily landed as fins only). A smaller proportional increase for mako shark is indicated on this basis. A TACC of 400 tonnes is proposed.

Other Management Measures

- 53 Specific measures are proposed in respect of:
- Providing for inclusion of mako shark on the Third Schedule as a species for which it is not possible to estimate MSY;
 - Allowing the return of live mako shark to the water;
 - Reviewing the conversion factors for mako shark;
 - Making consequential amendment to the fisheries reporting regulations; and
 - Setting a deemed value for mako shark.

Inclusion of mako shark on the Third Schedule

- 54 MFish proposes that mako shark be added to the Third Schedule of the 1996 Act.
- 55 Mako shark is a highly migratory species and NIWA reports that mako shark caught in New Zealand waters is part of a stock that includes the entire South Pacific. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. One of the criteria for inclusion of a stock on the Third Schedule is therefore satisfied.
- 56 Section 14 of the Act requires that species managed under s 14 be listed on the Third Schedule of the 1996 Act by Order in Council. Section 14 of the 1996 Act provides for the setting of an alternative TAC if the purpose of the Act is better achieved than by setting a TAC pursuant to s 13(2).

Return of mako shark to the water

- 57 MFish proposes that mako shark be added to the Sixth Schedule of the 1996 Act to allow its return to the water, with stated requirements that it must be likely to survive and must be returned to the waters from which it was taken as soon as practicable.
- 58 Adding mako shark to the Sixth Schedule will provide fishers that catch mako shark as a bycatch, with the flexibility to legally return these fish to the sea. MFish considers this an advantage as large mako shark may endanger fishers, while smaller sharks are of no or little value, but their take would impact upon the sustainability of the species. Details of this proposal are set out in Annex One at the end of this section.

Review the conversion factors for mako shark

- 59 As outlined in the section explaining the rationale for TACC setting, MFish considers that the current conversion factors applying to mako shark may not be correct.

Therefore, MFish proposes that a review be undertaken of the conversion factors for mako shark. This will be conducted during 2004 as part of a review of conversion factors for a range of species.

Consequential amendment to regulations

- 60 As a consequence of the introduction of mako shark into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this paper.

Deemed values and overfishing thresholds

- 61 A separate section in this document sets out generic information on the setting of interim and annual deemed values and overfishing thresholds proposed for mako shark. MFish proposes that mako shark be included within the low knowledge fishstock category.
- 62 MFish considers that with low information and poor reporting for mako shark it is appropriate to encourage the reporting of all catches of mako shark by setting a low deemed value for mako shark. There are no known sustainability concerns for mako shark that would necessitate a deterrent deemed value.
- 63 A port price for mako shark has not been determined, therefore MFish proposes to use a nominal annual deemed value for mako shark of \$0.15 per kg. Consistent with the framework for policy framework for deemed values and overfishing thresholds, MFish does not propose to set differential deemed values or overfishing thresholds for mako shark, unless monitoring of catch against the TACC suggest that this is required in the future.
- 64 MFish proposes that a carry forward of 10% of ACE be allowed for mako shark on the basis that this will not unreasonably increase sustainability risk to the stock, and will allow flexibility for fishers to manage their fishing operations.

Statutory Considerations

- 65 In forming the management options the following statutory considerations have been taken into account:
- a) The management options seek to ensure sustainability of the stock as required under s 8 by setting a TAC and other appropriate measures. Enhanced reporting will significantly improve understanding of the fishery and use of the Sixth Schedule will reduce unnecessary waste within the fishery. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers;
 - b) While mako shark is an inevitable bycatch of the tuna longline fishery and setting a TACC for mako shark could possibly act to constrain the target tuna fishery, MFish considers that this prospect can be mitigated by the inclusion of mako shark into the Sixth Schedule whereby mako shark can be returned to the sea;

- c) Mako shark is an inevitable bycatch of a number of target fisheries, principally the tuna longline fishery, and, with the exception of fins, there is little market opportunity for the species with some fishers discarding their catch. With a TACC set at the average of the last three years commercial catch, and an increment of 25%, MFish considers that there will not be a significant impact on social, economic and cultural factors;
- d) There is little known about the natural variability of mako shark. Mako shark prefer tropical and warm temperate waters so local changes in sea temperature may affect fishery access, but this would not represent a change in stock size;
- e) As mentioned, mako shark is a bycatch of fisheries that target their prey species such as other sharks and pelagic fishes and to a lesser extent squid, or, a bycatch of fisheries that target other species that predate on the same species, such as tuna. But there is no evidence that these interactions are of significant magnitude to impact on associated and dependent species, or on biological diversity. No other information has been considered about any effects of fishing for mako shark on any stock or on the aquatic environment;
- f) Being a pelagic oceanic species and an inevitable bycatch fishery, it is considered unlikely any potential impact to habitats of particular significance to fisheries management would be attributed to the bycatch of mako shark;
- g) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options for mako shark;
- h) For mako shark there is in place a bag limit for recreational fishers in FMAs 3, 5 and 6. MFish does not anticipate any change at this time;
- i) No fisheries plan exists or is proposed for MAK 1;
- j) As mako shark is solely a bycatch fishery, relevant conservation services or fisheries services are covered by the target fisheries. Therefore, relevant conservation services or fisheries services have not been considered in this paper. No decision has been made not to require a service in this fishery;
- k) There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for MAK 1;
- l) The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaitai exist in MAK 1, the values of the mātaitai will not be compromised as mako shark are an oceanic stock. No area has been closed or fishing method restricted for customary fishing purposes in MAK 1 that would affect the fishery. No restrictions have been placed on fishing in any area within MAK 1 for recreational interests; and
- m) Information sources used in this document include the NIWA report on biology and distribution of mako shark, MFish held catch, effort and landings data, and s.18 IPP submissions. All sources indicate a lack of detailed

information about aspects of the mako shark fishery, however MFish notes that the absence of information is not a reason for failing to provide for utilisation at levels considered to be sustainable.

Preliminary Recommendations

66 MFish recommends that the Minister:

- a) **Agrees** that the purpose of the 1996 Act is better achieved by setting a TAC for mako shark otherwise than in accordance with s 13(2).
- b) **Agrees** to add mako shark to the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
- c) **Agrees** to set a TAC of 506 tonnes for MAK 1 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 50 tonnes;
 - iii) An allowance for other fishing-related mortality of 46 tonnes; and
 - iv) A TACC of 400 tonnes.
- d) **Agrees** to add mako shark to the Sixth Schedule of the 1996 Act.
- e) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the code to be used by fishers when completing their statutory catch returns.

ANNEX ONE

Amendment to Regulations

Return of mako shark to the water

- 67 Mako shark frequently survives capture depending on the time hooked or the length of tow.
- 68 MFish proposes to provide for the return of mako shark to the sea by adding mako shark to the Sixth Schedule of the 1996 Act, with the following conditions:
- 69 That they are:
- a) Likely to survive;
 - b) Returned to the same waters from which they were taken; and
 - c) Are returned as soon as practicable after they are taken.

Problem definition

- 70 Mako shark is caught as a bycatch and not a target species, which means there is little economic value associated with its take but there is a cost imposed by the requirement to obtain ACE and on the sustainability of the species. Further, smaller shark are of little or no value, while landing and handling larger mako sharks can be very dangerous.

Preliminary consultation

- 71 The desirability of the option not to have to handle large mako shark was identified in the s 18 IPP submissions by Vela Fisheries Ltd.
- 72 The desirability of including mako shark on the Sixth Schedule is supported by the New Zealand Big Game Fishing Council.

Options

Non-Regulatory Measures

- 73 Unless mako shark is added to the Sixth Schedule, it will be illegal to return or release mako shark that is dangerous or of no economic value because of its size to the sea. There is no non-regulatory mechanism for returning fish taken under the QMS to the sea.

Regulatory Measures

- 74 To implement this measure it is necessary to add mako shark to the Sixth Schedule of the 1996 Act.

Costs and benefits of the proposal

- 75 Adding mako shark to the Sixth Schedule will provide fishers that catch mako shark as a bycatch with the flexibility to legally return these fish to the sea (provided they are returned alive, immediately). MFish considers this an advantage as large mako sharks may endanger fishers, while smaller sharks are of no or little value, but their take would impact upon the sustainability of the species. Allowing mako shark to be returned to the sea is the least cost option for fishers and should encourage fishers to adopt fishing practices that assist the survival of mako shark, especially since they will not be penalised by deemed value payments.

Administrative implications

- 76 There are no significant administrative implications.

ANNEX TWO

Species Information

Species Biology

- 77 The mako shark (*Isurus oxyrinchus*) is a member of the family Lamnidae, which also includes porbeagle, great white, and several other shark species. Lamnid sharks are typically large, powerful, active predators. The mako shark is an oceanic pelagic species that prefers tropical and warm temperate waters.
- 78 Mako shark lives mainly between latitudes 50 °N and 50 °S. It occurs worldwide in tropical and warm temperate waters. In the South Pacific, mako shark is rarely caught south of 40 °S in winter–spring (August–November) but in summer–autumn (December–April) it penetrates at least as far as 55 °S. Mako shark occurs throughout the New Zealand EEZ (to at least 49 °S), but is most abundant in the north, especially during the colder months. Mako shark has been recorded across a sea surface temperature range of 8–26 °C, but greatest catch rates were made at 15–20 °C.
- 79 The stock structure of mako shark in the Southern Hemisphere is unknown. However, given the scale of movements of tagged sharks, it seems likely that sharks in the South-west Pacific comprise a single stock. There is no evidence to indicate whether this stock also extends to the eastern South Pacific or the North Pacific.
- 80 Mako shark produce live young around 57–69 cm fork length (FL). In New Zealand, female makos mature at about 270 cm FL and males at about 190 cm FL. The length of the gestation period is uncertain because of a paucity of data, but is thought to be 18 months with a resting period between pregnancies leading to a two or three-year cycle. Only one pregnant female has been recorded from New Zealand, but new-born young are relatively common.
- 81 Litter size is four to 18 embryos. If the reproductive cycle lasts three years, and mean litter size is 12, mean annual fecundity would be four young.
- 82 In New Zealand, mako shark recruits to commercial fisheries during their first year, and much of the commercial catch is immature. Longevity and natural mortality rate are unknown for the population occurring around New Zealand.

Fisheries Characteristics

Commercial catch

- 83 Mako shark is an unavoidable bycatch in tuna longline fisheries, trawl and bottom longline fisheries. There are no target fisheries for mako shark in New Zealand, but the choice of fishing gear can influence the retention of sharks once caught (the use of steel traces).
- 84 Mako shark is caught commercially mainly by tuna longliners, but some is also taken by bottom longliners and bottom and midwater trawlers.

85 The commercial catch of mako shark is presented in Table 1.

Table 1: Commercial landings and discards (tonnes) of mako sharks reported by fishers (CELRs, CLRs, and TLCERs) and processors (LFRRs) by fishing year. Also shown are the estimated quantities of mako caught by tuna longliners, based on scaled up scientific observer records; values in parentheses are for the foreign chartered fleet plus one large domestic vessel only, because of insufficient observer coverage of the domestic fleet (Francis et al. 2001b). – = no data available.

Year	Reported by fishers			Total reported	Processed LFRR	Estimated catch by tuna longliners
	CELR and CLR	Discarded	TLCER processed wt			
1989–90	11	0	64	75	15	–
1990–91	15	0	61	76	21	–
1991–92	17	0	61	78	16	–
1992–93	24	1	20	44	29	–
1993–94	44	0	18	63	50	–
1994–95	62	1	24	87	69	–
1995–96	64	3	14	81	66	–
1996–97	37	14	42	93	55	113
1997–98	80	6	31	117	76	188
1998–99	83	9	50	142	98	(24)
1999–00	131	17	69	217	196	(13)
2000–01	274	21	107	402	319	–
2001–02	223	19	55	297	–	–

Catch by region

Table 2: Percentage of mako landings taken by FMA (CELR landed and CLR). 0, less than 0.5%; blank = no catch reported.

Year	NULL	MAK1	MAK2	MAK3	MAK4	MAK5	MAK6	MAK7	MAK8	MAK9	MAK10
1992–93		53	19	3	2	6		18	0		
1993–94		62	9	2	3	3		15	0	3	
1994–95	1	41	32	3	0	7		9	1	6	1
1995–96	5	50	12	2	3	22	2	3	1	1	
1996–97	1	58	6	2		8	1	23	2	0	
1997–98	0	55	18	0	0	4	2	9	1	11	
1998–99	14	27	26	4		16	1	7	1	1	2
1999–00	5	49	22	33	0	4	0	10	1	5	1
2000–01	0	65	21	4	0	3	0	3	0	1	1
2001–02		60	23	2	0	4	1	5	0	2	4
Total	2	55	21	3	0	6	1	7	1	3	2

Catch by method

86 Mako shark is caught commercially mainly by tuna longliners, but some is also taken by bottom longliners and bottom and midwater trawlers.

87 Only 5–18% of the landings reported on CELR (landed) and CLR forms were also reported on CELR (estimated catch) and TCEPR forms over the fishing years 1998–99 to 2001–02, so no breakdown of catch by target species, fishing method or

statistical area can be provided. However, catches were reported mainly from midwater trawl, bottom trawl, and surface longline fisheries.

Recreational catch

- 88 There is a significant recreational catch of mako shark and it is highly prized as a game fish. Several hundred mako sharks per year are reported landed by big game fishing clubs, but many more are tagged and released, or caught by fishers not belonging to one of these clubs.

Customary catch

- 89 There is no indication of the importance of mako shark to customary Māori fisheries. However, shark in general are known to be important and within that category there must be a take of mako shark. Therefore, the catch level has been set at 20% of the recreational catch.

Regulatory Framework

- 90 There is no Minimum Legal Size limit for either commercial or amateur fishers, nor are there any area or method restrictions.
- 91 There is an amateur daily bag limit for mako shark of one per person per day in FMAs 3, 5, and 6.

Fisheries Assessment

- 92 There have been no assessments of the potential yield of mako shark nor have any biomass estimates been made.

Associated Fisheries

- 93 There is limited information available for mako shark on the interdependence of stocks and any environmental conditions affecting the stock.
- 94 MFish notes that mako shark is an apex predator and as such will fulfil a significant role within the food chain, however, no information is available as to the implications of this function for the ecosystem and biodiversity.
- 95 Being solely a bycatch fishery, mako shark is associated with fisheries that target species that are either prey of mako shark, or species that also prey on the same species as mako shark. Mako shark is an active pelagic predator of other sharks and fishes, and to a lesser extent squid. There are few specific data on feeding of mako shark in New Zealand sharks, but pelagic fish predominate in the diet.

Environmental Issues

- 96 Being a bycatch fishery, any environmental effects associated with the mako fishery are accommodated within the provisions that apply to the target fisheries.

Research

- 97 There has been directed fisheries research on fish bycatch in tuna longline fisheries including mako shark in the past. Research support for the Gamefish tagging program continues and work is underway to assess the age and growth of mako shark in New Zealand fisheries waters.

Social, Cultural, and Economic Factors

- 98 MFish is not aware of any information on particular social, economic, or cultural matters that could influence the setting of the TAC and TACC for mako shark beyond those considered in the relevant sections earlier.

MAKO SHARK (MAK) – FINAL ADVICE

Initial Proposal

- 1 It was proposed in the initial position paper (IPP) to set the following TAC, allowance for customary fishing interests, recreational interests and other sources of fishing-related mortality, and TACC for mako shark (*Isurus oxyrinchus*) being introduced into the QMS on 1 October 2004 (refer Table 1).

Table 1: Proposed TACs, Allowances, and TACCs for mako shark (*Isurus oxyrinchus*) in tonnes

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
MAK 1	506	10	50	46	400

- 2 This proposal was part of a package of measures regarding the introduction of mako shark into the QMS. Other measures proposed for this stock included:
- Listing mako shark on the Third Schedule of the 1996 Act, so that mako shark can be managed with an alternative TAC;
 - Listing mako shark on the Sixth Schedule to the 1996 Act, so that mako shark may be returned to the sea in accordance if they are:
 - Likely to survive;
 - Returned to the same waters from which they are taken; and
 - Are returned as soon as practical.
 - Reviewing the conversion factors for mako shark;
 - Amending the reporting regulations to ensure that the appropriate fishstock code for mako shark is used under the QMS; and
 - Setting a deemed value, but no differential deemed value or overfishing threshold, for mako shark.

Submissions

- 3 Ten submissions were received on the mako shark proposals from the following submitters:
- **P Clarke**
 - **D Glass**
 - **David J. McIntosh**
 - **New Zealand Big Game Fishing Council (NZBGFC)**
 - **Seafood Industry Council (SeaFIC)**
 - **Sanford Limited**
 - **Sealord Group Limited (Sealord)**
 - **Te Ohu Kai Moana (TOKM)**
 - **Tolaga Bay East Cape Charters (TBECC)**
 - **Te Rūnanga o Ōtākou (TRO)**

- 4 The specific submissions on the proposals for mako shark are summarised and addressed under the relevant following headings below.

Biological and Fishery Information

Submissions

- 5 The submissions received did not raise any issues concerning the biological or fishery information for mako shark provided in the IPP (refer para 4-19).

MFish Discussion

- 6 The IPP contains a discussion of biological and fishery information (refer IPP para 77-95). Since the release of the IPP NIWA has advised MFish of corrections to the commercial landing information provided to MFish for use in calculating the MAK 1 TAC/TACC (refer Table 2). Commercial landing and discard information is also now available for the most recent fishing year (2002-03). MFish considers that commercial data from the most recent fishing year should be taken into account when setting the TAC and TACC for MAK 1.

Table 2: Commercial landings and discards (t) of mako sharks reported by fishers (CELRs and CLRs) and processors (LFRRs) by fishing year.

Year	CELR and CLR		Total	LFRR
	Landed	Discarded	Reported	
1989-90	11	0	11	15
1990-91	15	0	15	21
1991-92	17	0	17	16
1992-93	24	1	24	29
1993-94	44	0	44	50
1994-95	62	1	63	69
1995-96	64	3	67	66
1996-97	37	14	51	55
1997-98	80	6	86	76
1998-99	83	9	93	98
1999-00	131	17	148	196
2000-01	274	21	295	319
2001-02	223	19	242	245
2002-03	218	15	233	223

Environmental Considerations

Submissions

- 7 No submissions were received on the environmental considerations relating to the sustainability measures proposed for mako shark, outlined in the IPP.

MFish Discussion

- 8 The IPP outlines relevant environmental considerations relating to the setting of sustainability measures for mako shark (refer IPP para 96).

- 9 As noted in the IPP, mako shark is solely a bycatch fishery and as such the environmental impacts of fishing also need to be considered under the management provisions of the target species, in this case the surface longline fishery for tuna.

TACs, Allowances and TACC setting considerations

Submissions

Recreational Allowance

- 10 Submitter **D. Glass** notes there is a significant disparity between the proposed recreational and customary allowances compared to the allowance proposed for 'other mortality' and the TACC. D Glass contends that the recreational and customary allowances for mako shark are not adequately provided for.
- 11 **NZBGFC** notes that their records show a marked decline in recreational mako shark catch over the last nine years, and this is of significant concern to their clubs. NZBGFC attributes this decline to the expansion of the domestic surface longline fleet in northern New Zealand. NZBGFC illustrate the decline by providing data from the NZBGFC year books showing that since the 1994-95 fishing season, the total number of mako shark caught has steadily declined from 1693 to 350 in the 2002-03 fishing season, a decrease of 80%.

Customary Allowance

- 12 **TRO** notes that the Minister is required to develop policies to help recognise the use and management practices of takatā whenua in the exercise of customary non-commercial fishing rights. TRO requests that 25% of the TAC be provided as a non-commercial allowance, of which 80% should be provided as a customary allowance. TRO requests this allocation to avoid the risk of commercial and non-commercial users coming into conflict in the future. Such an allocation would provide an effective means for Kaitiaki Runaka to exercise their kaitiakitaka responsibility.

Other Sources of Fishing-Related Mortality Allowances

- 13 No submissions regarding the proposal to allow for other sources of fishing-related mortality for mako shark were received

TACCs

- 14 **TRO** requests that a precautionary approach be adopted when setting TACs and TACCs for species where there is no catch history.
- 15 **P. Clarke** and **D. Glass** consider that the TACC's proposed for the shark species are unlikely to be sustainable based on information contained in the IPP.
- 16 **NZBGFC** considers that an expansion of mako shark catch at this time is inappropriate and that better catch data are needed, perhaps through an Adaptive Management Plan, before introducing mako shark into the QMS. NZBGFC also contends that it is not possible to manage a species under the QMS when there are no robust data on catch.
- 17 **TBECC** submit that surface longlining has decimated pelagic shark populations on the east coast of the north island. TBECC believes any uncertainty over the mako shark stock size should result in very low quotas until there is certainty that the stock size has increased and can stand a TAC increase.
- 18 **TOKM** does not support the proposal to set the initial TAC as the average of commercial landing during the past 3 years plus 50% because mako shark cannot be targeted, and is caught by a range of fisheries and methods. In addition, TOKM considers that there is little evidence, other than anecdotal, that mako shark numbers available in New Zealand waters are in any way under threat and that commercial landings are not showing a decline. Climatic conditions may account for a reduction in mako numbers in areas. TOKM question the relevance of the low risk near threatened status of mako shark in the South-east Pacific area.
- 19 TOKM agrees that conversion factors for mako shark are seriously understated but that plucking correction factors 'from the air' to add a load to reported landings is not acceptable. TOKM therefore, wishes to see a review of conversion factors for mako shark.
- 20 TOKM suggests that the TAC/TACC for mako shark be set at the best annual commercial catch reported over the last five fishing years, plus a 100% allowance, and review this level after three years. TOKM agrees with the catch levels and allowances provided for recreational, customary, and other sources of mortality.
- 21 **SeaFIC**, **Sanford Limited** and **Sealord** have submitted that the MAK 1 TACC should be recalculated using Licensed Fish Receiver Return (LFRR) data as a starting point for estimating landings and corrected with the proposed new conversion factors and the estimate of the proportion of pelagic sharks recorded in the generic shark reporting codes. Once more accurate catch landing information becoming available the TACC should be reviewed using the low knowledge bycatch fishery framework.

MFish Discussion

TAC

- 22 In setting the TAC under section 14, MFish proposed that, in the absence of information to undertake an assessment of the potential yield of mako shark, the TAC should be based on estimates of current utilization (refer IPP para 17). MFish has based estimates of utilisation on the best available information, including that contained in the submissions. Revised

estimates of current utilisation have been used to recommend a TAC of 512 tonnes. The TAC proposed in the IPP was 506 tonnes.

Recreational Allowance

- 23 There is little quantitative information on recreational catch of mako shark. MFish proposed in the IPP, that the recreational allowance be set at a nominal 50 tonnes level based on a consideration of statutory obligations and policy guidelines. MFish notes that the average season catch of NZBGFC affiliated clubs since the 1996-97 season is 26 tonnes which is well within the allowance proposed. The IPP contains a discussion of matters relating to the setting of the recreational allowance (refer IPP para 37-40). MFish confirms that its position on the recreational allowance remains as set out in the IPP and recommends an allowance of 50 tonnes.

Customary Allowance

- 24 TRO has requested that 25% of the mako shark TAC be provided as a non-commercial allowance. MFish notes that currently the non-commercial catch of mako shark is low. MFish is of the view that allocation of 25% of the TAC to non-commercial fishers is not appropriate. The TAC proposed for mako shark is based on a best estimate of current utilisation. To then allow 25% of this amount for non-commercial use would have a severe economic impact on the commercial target fisheries that take mako shark as a bycatch. The submission by TRO is addressed in further detail in the generic section of this advice.
- 25 The IPP contains a discussion of matters relating to the setting of the customary allowances (refer IPP para 41). MFish confirms that its position on customary allowances remains as stated in the IPP and recommends an allowance of 10 tonnes.

Other Sources of Fishing-Related Mortality

- 26 The IPP contains a discussion of matters relating to the setting of the allowances for other sources of fishing-related mortality (refer IPP para 42-43). No submissions were received on this issue. MFish confirms that its position on allowances for fishing-related mortality remains as stated in the IPP and recommends an allowance of 10% of the TACC and other allowances combined.

TACC

- 27 MFish agrees with submitters that estimating commercial catch of mako shark is problematic. The IPP contains a discussion of matters relating to the setting of the TACC (refer IPP para 44-52). MFish agrees with the SeaFIC and supporting submissions that the estimate of current commercial utilisation used for the MAK 1 TACC should be based on LFRR data. This data has now been corrected for the proportion of landings as shark fins, using the proposed new conversion factor that is currently subject to consultation with stakeholders. Further correction is required to allow for an estimate of the proportion of pelagic sharks recorded in the generic shark reporting codes. MFish also supports the TAC being reviewed following more accurate catch landing information becoming available.
- 28 However, MFish notes the comments and information supplied by P Clarke, D. Glass, TBECC, and NZBGFC. These three submitters believe that there has been a dramatic decline in the mako shark stock in recent years. MFish also notes that since 2000-01 MFish Compliance considers that the reporting of shark landings is likely to be significantly

improved in recent years. Fishing effort across a range of fisheries has been reasonably consistent over the last three fishing years however there has been a consistent decline in the commercial landings of mako shark. Recreational submissions also point to a decline in recreational catch of mako shark.

- 29 There are indications of declining catches of mako shark. Mako shark are known to be vulnerable to fishing pressure because of their low reproductive capacity and there are sustainability issues associated with the fact that the New Zealand fishery predominantly harvests immature mako shark. MFish therefore believes that an element of caution is needed when setting the TAC/TACC prior to the provision of better information anticipated from management under the QMS. MFish supports the industry request for a review of the TAC when better data is available, but does not support TOKM's request for basing the TACC on the best years catch of the past five fishing years plus a 100% allowance.
- 30 MFish has recalculated the proposed TACC in the manner requested by SeaFIC and supporting submissions. The recalculated TACC based on LFRR data from the most recent three fishing years and corrected for the proposed new conversion factor for the landed state FIN together with recorded discards is shown in Table 3. The percentage of the catch landed as shark fins was obtained from LFR data. MFish notes that with improved reporting the incidence of mako shark being recorded under the codes OSD and SHA is minimal during the past three fishing years.

Table 3: Fishing year catch of MAK 1 based on LFRR and discard catch data with correction for a change in conversion factor from 30 to 59 for mako shark.

Fishing Year	LFRR (t)	50% Finned Corrected for a Conversion Factor of 59	Discards (t)	Total (t)
2000-01	319	474	21	495
2001-02	245	363	19	382
2002-03	223	331	15	346
3 Year Average				406

- 31 MFish notes that the TACC proposed in the IPP is 6 tonnes less than the average of recalculated recent landings. MFish considers that the revised figures are the best available information on which to base a TACC and recommends a TACC of 406 tonnes.

Social, Cultural and Economic Factors

Submissions

- 32 **SeaFIC, TOKM, Sanford Ltd and Sealord** note that despite the measures MFish is proposing to aid the introduction of mako shark into the QMS, the TACC will be set substantially below actual current landings. They are concerned that TACC set below actual landings will impose significant costs on the fishing industry. These costs include:
- Deemed values penalties to cover catches beyond the TACC;
 - Lost opportunity cost within target fisheries constrained by the availability of annual catch entitlement (ACE) for bycatch shark species; and
 - Increased operational costs as fishers are forced to alter fishing practices to avoid catching shark bycatch.

MFish Discussion

- 33 MFish acknowledges that there will be costs to individual fishers that catch mako shark as a bycatch of their fishing operations associated with the entry of this species in the QMS and with the TACC proposed. MFish has proposed specific measures to mitigate these costs as follows:
- Allowing the return of live mako shark to the sea;
 - Setting of a low deemed value; and
 - Setting no differential deemed value or overfishing thresholds.
- 34 Further, MFish believes that the costs must be balanced against sustainability risks to that part of the mako shark stock found in New Zealand fisheries waters. Current information, while limited, does not suggest that an unrestrained TACC is appropriate for this species.
- 35 MFish notes that the provisional catch history years for highly migratory target and bycatch species do not overlap. Therefore, many fishers may not have sufficient provisional catch history to cover their bycatch and there will be likely initial costs associated with acquiring quota or ACE. The majority of quota will initially be held by the Crown. MFish notes that Crown holdings of MAK 1 quota will be sufficient to provide for the 20% allocation required for Maori.
- 36 The IPP contains information relating to social, cultural and economic factors (refer IPP para 98). MFish confirms that its position on social, cultural and economic factors remain as stated in the IPP.

Other Management Measures

Submissions

Third Schedule

- 37 **SeaFIC, TOKM, Sanford Limited and Sealord** support the inclusion of mako shark in the Third Schedule but note that within season adjustments to the TAC will be impractical because of the difficulties of measuring in-season abundance.

Sixth Schedule

- 38 **SeaFIC, TOKM, Sanford Limited, Sealord and NZBGFC** support the proposal to put mako shark on the Sixth schedule.

Review of Conversion Factors

- 39 **SeaFIC, TOKM, Sanford Limited, and Sealord** support the need to review conversion factors to ensure accurate estimates of landings, but consider the TACC should be set on the basis of current catch using the new conversion factor.

Deemed Value and Overfishing Threshold

- 40 **SeaFIC, TOKM, Sanford Limited, and Sealord Group Limited** agree with the proposals for mako shark to set the annual deemed value at 60% of the port price and not setting an overfishing threshold.

Shark Finning

- 41 **TOKM, NZBGFC and TBECC** have submitted on the inappropriateness of shark finning and the need to provide incentives for fishers to fully utilize their shark bycatch or release it alive. They further submit that, in line with international developments, New Zealand should prohibit shark finning.

MFish Discussion

- 42 MFish notes the support of industry for the package of additional management controls proposed in the IPP to assist the introduction of mako shark into the QMS. Accordingly MFish recommends that mako shark is added to the Sixth Schedules of the Act as proposed in the IPP. Specific conditions proposed for the Sixth Schedule listing are that the mako sharks are likely to survive and must be returned to the same waters from which they were taken as soon as practicable. MFish has proposed the addition of mako shark to the Third Schedule of the Act in separate advice.
- 43 Submissions support the proposal in the IPP to review the conversion factor for mako shark. A detailed proposal has been released for further consultation.
- 44 MFish is concerned to avoid an increase in the demand for mako shark that would occur from providing for the development of target fisheries. However, it does not wish to impose unreasonable constraint on fishers particularly during a period of rationalisation of the tuna longline fishery. Taking these matters into account MFish has proposed that the TACC be set on the basis of average catch.
- 45 Current catch should be sufficient to satisfy demand in the fishery for bycatch but added flexibility is provided by the Sixth Schedule provision allowing the release of live mako sharks in the event the level of the TACC is constraining. In this environment MFish considers that deemed values for mako shark should be on the lower end of the continuum between port price and the transaction costs involved in acquiring and or holding a quantum of ACE. This will also reduce the potential for deemed values to distort the market for ACE during the period of transition of mako shark into the QMS.
- 46 For this reason, while MFish notes the support in submission for setting deemed values at 60% of the port price for mako shark MFish proposes that deemed values are set at a lower level. In the absence of port price information a nominal deemed value of \$0.15/kg was suggested in the IPP. A port price of \$0.84/kg has now been determined for mako shark. MFish acknowledges that the deemed value level should be linked more appropriately to the ACE value but this value is not known at this time. Therefore, MFish proposes to retain the deemed value proposed in the IPP (\$0.15/kg), which now represents 18% of the port price but is above the likely transaction and levy costs anticipated for this fishery.
- 47 MFish considers that the QMS will provide strong incentives to reduce the practise of landing only the fins of shark bycatch because individual fishers catch will be constrained by ACE holdings and there will be a financial incentive to maximise the return on the ACE held. MFish considers that fishers will attempt to maximise the returns from their catch and MFish anticipates an increase in landed products (carcase and fins) of mako shark once it is introduced into the QMS on 1 October 2004. The mako shark fishery will be monitored to determine whether this is the case.

Legal Obligations

- 48 The statutory considerations that must be taken into account when setting a TAC and allowances for mako shark were identified in the IPP (refer to IPP para 65). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Conclusion

- 49 In the IPP, MFish proposed a TAC and allowances for the mako shark stock to be introduced into the QMS on 1 October 2004 (refer Table 1) and provided a summary of the species biology, a characterisation of the fishery and an overview of the present regulatory framework.
- 50 There is no information to make an assessment of the potential yield of mako shark. MSY cannot be estimated for mako shark, as the fish found in New Zealand are only part of a wide-ranging stock. Consequently, MFish has proposed that mako shark be included on the Third Schedule to the Act and proposes that a TAC is set pursuant to s 14 of the Act. Any TAC set under s 14 of the Act can be set at a level that is not based on MSY provided that the TAC better meets the purpose of the Act than a TAC set under section 13(2).
- 51 In the absence of estimates of sustainable catch it is proposed to base the MAK 1 TAC, allowances and TACC on estimates of current utilisation. There was new information in submissions and from NIWA on commercial and recreational catch of mako shark. MFish has recalculated commercial catch using the new information in the manner requested by industry. MFish now proposes a TACC of 406 tonnes for MAK 1 (400 tonnes was proposed in the IPP).
- 52 MFish has considered the best available information on catches, habitat and biology of the stocks, and statutory considerations in proposing the MAK 1 TAC, allowances and TACC. MFish believes the TAC proposals are consistent with s 14 because they better meet the purpose of the Act and the TACC proposals are consistent with s 21 in that the matters to be considered when setting a TACC have been addressed. MFish also believes that the proposed TAC and TACC levels provide for utilisation of mako shark while imposing measures to ensure its sustainability (s 8).
- 53 Given the indications of a declining recreational and commercial catches of mako shark and the sustainability issues associated with the harvesting of immature mako shark, MFish believes that an element of caution is needed when setting the TAC/TACC prior to the provision of better information anticipated from management under the QMS. Accordingly, MFish considers that the TACC should be based on the average of commercial catch of the past three fishing years, but endorses the industry request for a review of the TACC when additional information is available.
- 54 MFish notes the support of industry for the package of additional management controls proposed in the IPP to assist the introduction of mako shark into the QMS. Accordingly MFish recommends that the additional management controls proposed in the IPP be implemented when mako shark is introduced into the QMS on 1 October 2004.
- 55 Concerns were raised in submissions about shark finning and most proposed that it be banned. MFish considers that the QMS provides strong incentives to reduce the practise of only landing the fins of shark bycatch. MFish intends to monitor the practice of shark finning but anticipates a reduction once mako shark is introduced into the QMS on 1 October 2004.

Recommendations

- 56 MFish recommends you:

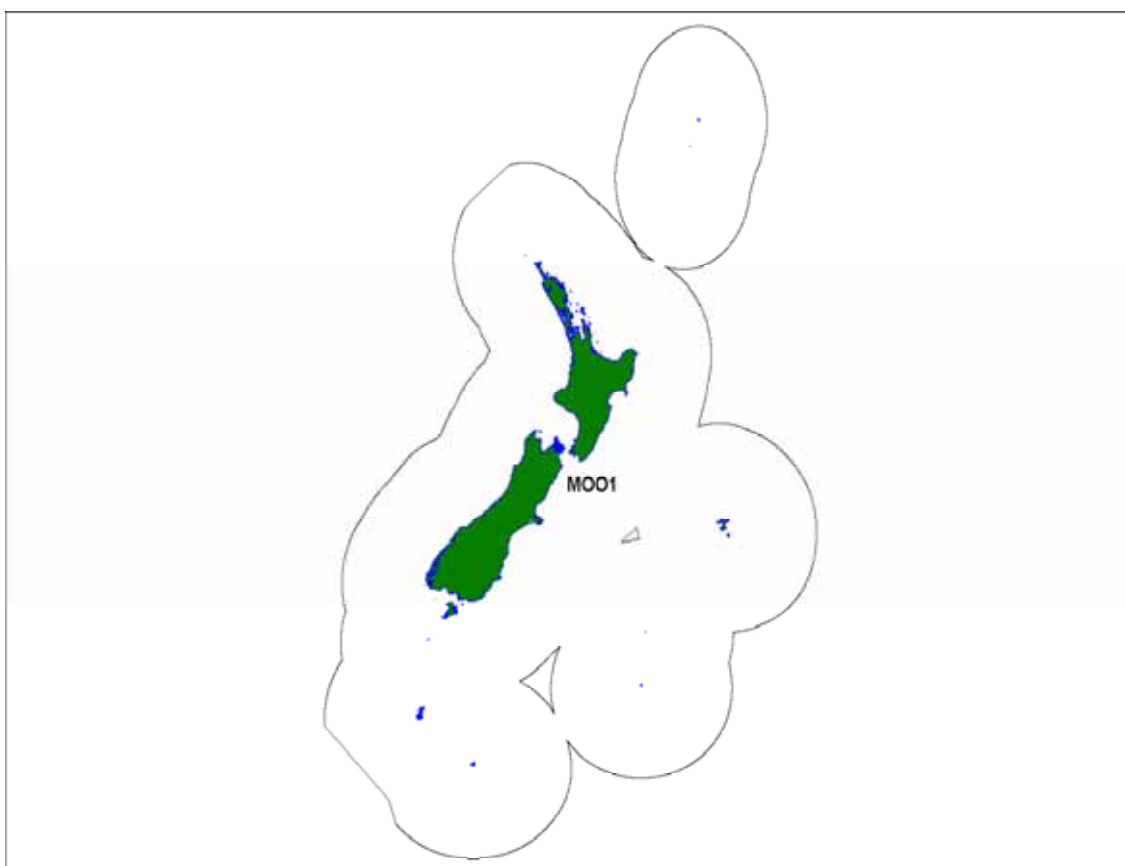
- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for mako shark otherwise than in accordance with s 13(2).
- b) **Agree** to set a TAC for mako shark pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 512 tonnes for MAK 1 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 50 tonnes;
 - iii) An allowance for other fishing-related mortality of 46 tonnes; and
 - iv) A TACC of 406 tonnes.
- d) **Agree** to add mako shark to the Sixth Schedule of the Act subject to the conditions that they are:
 - i) Likely to survive;
 - ii) Returned to the same waters from which they are taken; and
 - iii) Are returned as soon as practical.
- e) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.
- f) **Agree** to set the deemed value for MAK 1 at \$0.15/kg.
- g) **Note** that a review of the conversion factor for mako shark fins is underway.

MOONFISH (MOO) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Moonfish (*Lampris guttatus*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Area (QMA) for moonfish is shown in Figure 1. The fishing year for moonfish will be from 1 October through to 30 September in the following year, and the total allowable commercial catch (TACC) and annual catch entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: Quota Management Area for moonfish



Key Issues to be Considered

- 2 Several key factors are relevant when considering setting the TAC and other controls for moonfish:
 - a) Moonfish is chiefly a bycatch of the tuna fishery, specifically bigeye tuna;
 - b) Moonfish is not legally defined as a highly migratory species but MFish considers that biologically it is a highly migratory species;
 - c) It is not possible to estimate MSY for that part of the moonfish stock found in New Zealand fisheries waters;

- d) Little is known of the biology of moonfish but there are no known sustainability issues;
- e) Development opportunities for this species in New Zealand fisheries waters may exist; and
- f) It is not desirable that bycatch species unnecessarily limit the catch of high value target species;

List of Management Options

- 3 It is proposed that moonfish is listed on the Third Schedule and a TAC is set pursuant to s 14 of the 1996 Act.
- 4 Table 1 gives the proposed TAC, TACC and allowances for moonfish.

Table 1: Proposed options for a TAC, TACC, and allowances for moonfish (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
MOO 1	439	0	0	0	439 ¹
OR					
MOO 1	527	0	0	0	527 ²

¹ Top year 351 t plus 25%

² Top year 351 t plus 50%

- 5 It is further proposed to:
 - a) Set a deemed value of \$0.50 per kg for moonfish;
 - b) Not apply differential deemed values;
 - c) Provide for the carry over of under-fishing rights by not listing moonfish on Schedule 5A of the 1996 Act; and
 - d) Make consequential amendments to the Fisheries (Reporting) Regulations 2001.

TACs

TAC management strategy

- 6 Section 14 of the 1996 Act provides an exception to setting a TAC based on an assessment of MSY where the Minister is satisfied that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2). MFish believes that a TAC set under the provisions of s 14 of the 1996 Act can better provide for utilisation (“conserving, using, enhancing and developing fisheries resources to enable people to provide for their social, economic and cultural wellbeing”) for stocks whose range extends beyond the bounds of New Zealand fisheries waters while still ensuring their sustainability.
- 7 Further s 14(7) provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

- 8 It is not possible to estimate the MSY for the part of the moonfish stock that is found within New Zealand fisheries waters. While moonfish is not legally defined as a highly migratory species (it is not listed in Annex I of the United Nations Law of the Sea), MFish is of the opinion that biologically it is a highly migratory species. A criterion for the inclusion of moonfish on the Third Schedule is therefore satisfied.
- 9 An Order in Council listing moonfish on the Third Schedule would allow for the Minister to set a TAC for moonfish under s 14 should he determine that the purpose of the 1996 Act is better achieved by setting an alternative TAC.

Rationale for Proposed TACs

- 10 In the absence of estimates of sustainable catch for moonfish, a TAC is proposed that is based on estimates of current utilisation and an evaluation of the potential for expansion of the fishery.
- 11 The best annual catch of moonfish in recent years is 351 tonnes (in 2000-01). Moonfish is taken primarily as a bycatch of fishing for bigeye tuna. Comment from fishers indicates that catches of bigeye tuna may have been constrained as fishers spend a proportion of their time within a fishing year competing for southern bluefin tuna. The fishery for southern bluefin tuna is primarily in more southern waters where a bycatch of moonfish is less likely. The potential of the bigeye tuna target fishery and associated bycatch of moonfish within New Zealand fisheries waters has not, therefore, been fully explored. This is particularly the case in the Kermadec fishery management area (FMA) where there has been little fishing by domestic vessels.
- 12 There are no international assessments that suggest any sustainability concerns for moonfish. While New Zealand has an obligation to exercise reasonable restraint in the development of its fisheries for highly migratory species (arising from resolutions of the Preparatory Conference for the Commission for the Conservation of Highly Migratory Stocks in the Central and Western Pacific) MFish does not consider that it is unreasonable to provide for expansion in the level of the moonfish fishing within New Zealand fisheries waters.
- 13 Policy guidelines suggest that the opportunity for development and the extent of utilisation provided for needs to be assessed on a stock-by-stock basis having regard to risk based on the following factors:
- 14 **Sustainability of the stock**, for moonfish there are no known sustainability issues with the exception that overseas information suggest that the potential for moonfish to rebuild from an over fished situation is low.
- 15 **Biology of the stock and potential for local depletion**, the distribution and degree of residence of moonfish within New Zealand fisheries waters is not well understood. There are no indications of local depletion from the data available.
- 16 **Impacts of fishing on the aquatic environment including bycatch**, for moonfish this is a factor of low risk. Moonfish is taken as a bycatch of the bigeye tuna target fishery. Prospective catch limits are also proposed for bigeye tuna.

- 17 The target species is most likely to drive fishing effort in the tuna longline fishery because of the substantial difference in value between tuna and associated bycatch species. There are no indications from reported catches that the proportion of moonfish to bigeye catch has declined. In fact the converse is the case in the most recent fishing years (refer Figure 2).
- 18 There are unquantified risks to the long term viability of associated and dependent species associated with the method of tuna longlining, however, MFish does not consider that these are exacerbated by the TAC options proposed for moonfish.
- 19 **Socio economic and cultural issues**, with regard to moonfish there are clear benefits to the fishery if an expansion in catch can be realised and sustained. There will be increased revenue for the fishery and an economic benefit to the nation as a whole.
- 20 **Anecdotal information on abundance and size of likely habitat in the management area**, the Kermadec FMA is an area that has only be lightly fished for bigeye tuna by domestic fishers. Anecdote and historical foreign licensed catch suggest this area provides expansion potential for the fishery and associated bycatch such as moonfish.
- 21 On balance the risks associated with an increase in catch of moonfish are considered to be low. MFish therefore proposes to set a prospective TAC for moonfish. Two options are proposed:
- Option One: 439 tonnes
 - Option Two: 527 tonnes
- 22 The choice of options is dependent on the level of risk associated with the development of the fishery. MFish has not proposed options higher than a 50% increase on the best years catch until more is known about the distribution of moonfish in New Zealand fisheries waters and the potential interactions with other target and non-target species. However, MFish considers that the risks associated with the higher of the TAC options proposed are manageable and provide more opportunity for the development of what is considered to be an under-utilised fishery. The MFish initial preference is for a TAC of 527 tonnes.
- 23 MFish notes that there is provision in s 14(7) for an in season increase in TAC if the abundance of moonfish in any fishing year suggests that more may be taken. Any in season increase is given effect through the increase in ACE entitlement in accordance with s 68 of the 1996 Act.
- 24 Further, the annual TAC and TACC is subject to review based on the performance of the fishery. If the TAC proves to be limiting the development of the fishery (eg, the fishery is consistently fully caught) then there is an annual opportunity to consider proposals for a TAC increase.

Allocation of TAC

Recreational Allowance

- 25 The recreational allowance proposed is 0 tonnes as there is no information available to MFish to suggest there is a recreational take.

Customary Māori Allowance

- 26 The customary allowance proposed is 0 tonnes. There is no information available to MFish to suggest that there is any customary harvest and moonfish is not known to be a species of particular significance to customary Māori fishers.

Allowance for other sources of mortality

- 27 No allowance has been set for other sources of mortality. There is likely to be a level of discarding of moonfish in the current fishery. QMS rules will require that all moonfish is retained and landed once the species is introduced into the QMS. There is no information available to MFish to suggest that an allowance is required to cover lost and damaged fish.

TACC

- 28 TACCs are proposed based on current utilisation increased to provide for development opportunity in the fishery. Options are an increase of 25% over and above the best annual catch over the most recent five years (351 tonnes) or an increase of 50% over and above the best annual catch.
- Option One: 439 tonnes
 - Option Two: 527 tonnes
- 29 MFish assesses that the level of risk associated with the higher TAC option proposed is manageable and the adoption of this option and associated TACC (527 tonnes) is the MFish preferred initial position. Greater potential economic benefits are associated with this TACC.

Other Management Measures

Schedule 5A

- 30 MFish does not propose to list MOO 1 on Schedule 5A of the Act and proposes to allow underfishing to be carried forward.

Method Restriction

- 31 MFish notes there are operational controls imposed on line and trawl target fisheries to mitigate the impact of these fishing methods on marine mammals and seabirds. Controls include prohibitions on net sonde monitor cables, the use of tori lines and compulsory reporting of bycatch of protected species. Fishers also use a number of voluntary codes of practice. Further requirements may arise when the National Plan of Action for seabird protection becomes operational in October 2004.

Consequential amendment to regulations

- 32 As a consequence of the introduction of moonfish into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this paper.

Deemed values and overfishing thresholds

- 33 A separate section of this document sets out generic information on the setting of interim and annual deemed values.
- 34 MFish considers that moonfish is a low knowledge stock with no sustainability concerns. There is no port price assessed for moonfish. SeaFIC provides an estimate of port price of \$100 per tonne (\$0.10 per kg). MFish considers that this estimate may be too low and proposes a nominal deemed value of \$0.50 per kg for moonfish. MFish welcomes comments in response to this proposal and hopes to clarify the commercial value of moonfish by way of submission.
- 35 Consistent with the policy framework for deemed values and overfishing thresholds, MFish does not propose to set differential deemed values or overfishing thresholds for moonfish. MFish will monitor catch against the TACC in order to determine whether a review of this is required in the future.

Statutory Considerations

- 36 The management options presented for moonfish seek to better achieve the purpose of the 1996 Act (s 14) by providing opportunity for further unitisation (development) within what should be a sustainable catch of this species within New Zealand fisheries waters balanced against an obligation to exercise reasonable restraint in the development of the fishery. The proposals are considered to be consistent with New Zealand's international obligations in relation to fishing and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5).
- 37 The fishery for moonfish is as a bycatch of targeting the more abundant tuna species such as bigeye and southern bluefin tuna. A wide range of fish species are taken as bycatch of surface longline fishing. Catch levels vary but many of these species are only rarely taken. The main fish bycatch species associated with the surface longline fishery within New Zealand fisheries waters are to be introduced into the QMS. This will provide the mechanisms for sustainability actions as required (ss 9(a) and (b)).
- 38 There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of moonfish into the QMS may improve our ability to address these issues by requiring the incorporation of new information as it comes to hand in the process of determining catch limits for the fishery.

- 39 Moonfish is a top predator that is believed to be a very efficient consumer with an eclectic diet. Moonfish is known to consume a wide range of fish including dealfish, frostfish, hatchetfish, lancetfish, lanternfish, lookdown dory, Ray's bream and snipe eels. It also feeds on octopus, squid, molluscs and crabs, the latter indicating that it is also capable of bottom feeding. It is occasional prey for top predators like blue and mako sharks.
- 40 There are known effects of tuna longline fishing on the aquatic environment (seabirds) but steps have been and continue to be taken to mitigate these risks (refer Annex One (s 9(b))).
- 41 Moonfish are not known to be a highly variable stock. It is not known if the availability of moonfish within New Zealand fisheries waters varies on an annual basis (s 11(1)(c)).
- 42 Tuna longlining is not known to pose a risk to benthic habitat of particular significance to fisheries management. The pelagic habitat and any associate risks of fishing are poorly understood (s 9(c)).
- 43 Before setting any sustainability measure, the Minister must have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, and any management strategy or management plan under the Conservation Act 1987 that applies to the coastal marine area and is considered to be relevant by the Minister. MFish is not aware of any provisions in any strategy or planning document under the Resource Management Act or the Conservation Act that are relevant to the setting of sustainability measures for moonfish (ss 11(2)(a) and (b)).
- 44 Similarly, before setting any sustainability measure relevant to the Hauraki Gulf (eg, a TAC for the moonfish), the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000 Act. The Hauraki Gulf is defined in that Act to include all coastal waters and offshore islands from near Te Arai Point offshore to the Moko Hinau Islands, and south to Homunga Point (north of Waihi Beach). This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. Moonfish is not known to occur within the waters of the Hauraki Gulf Marine Park and the proposals are not considered to impact upon the objectives of the Park (s 11(2)(c)).
- 45 Before setting any sustainability measure, the Minister must also take into account any conservation services or fisheries services, any relevant fisheries plan approved under the Act, and any decisions not to require conservation services or fisheries services. There are no relevant fisheries plans approved that would have any bearing on the setting of a TAC for moonfish. Conservation and fisheries services apply to tuna fisheries generally in order to assess and monitor the impacts of fishing on non-target fish and non-fish species. Further there have been no decisions not to require conservation services or fisheries services (s 11(2A)).
- 46 Sections 21(1)(a and b) and (21)(4)(i and ii) and (21)(5) require the Minister to allow for non-commercial fishing interests (recreational and Māori), and other mortality to the stock caused by fishing. The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC. No allowances

have been made for recreational and customary interests and all other mortality to the stock caused by fishing as MFish is not aware of any use by these groups or incidental mortality. No mātaítai in the QMA applies in the area of the fishery. No area has been closed or fishing method restricted for customary fishing purposes in the QMA that would apply to this pelagic fishery. No restrictions have been placed on fishing in any area within the QMA for recreational interests.

- 47 The information used to develop proposals for moonfish is limited. There are no overseas assessments of the stock. Information from commercial catches in New Zealand fisheries waters is limited with respect to evaluating levels of sustainable harvest. MFish notes however that uncertainty in information is not a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act. MFish considers that the proposals to provide for increased utilisation of moonfish do not pose any short-term risk to the sustainability of the stock.

Preliminary Recommendations

- 48 MFish recommends that the Minister:

- a) **Agrees** that the purpose of the 1996 Act is better achieved by setting a TAC for moonfish otherwise than in accordance with s 13(2).
- b) **Agrees** to list moonfish on the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
- c) **Agrees** to set a TAC of 527 tonnes for MOO 1 and within that TAC set:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 527 tonnes.
- d) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.
- e) **Agrees** to set the annual deemed value for moonfish stocks at \$0.50 per kg.

ANNEX ONE

Species Information

Species Biology

- 49 Moonfish (*Lampris guttatus*) is a pelagic species that occurs in surface waters to depths of about 500m, typically well offshore. Moonfish occurs in tropical and temperate waters of the Pacific Ocean as well as all other major oceans of the world.
- 50 Little is known about the biology of moonfish, and whether it is vulnerable to overfishing. Moonfish have a solitary existence, large size and weight (up to 2 m in length and 270 kg in weight), and are top predators with eclectic diets. Moonfish populations appear to have low resilience (comparatively low rebound) with a minimum doubling time of between 4.5 and 14 years according to moonfish information found on an international fisheries website¹.
- 51 It is not known if the recent catch of moonfish is sustainable or not. There is little information about the biology and ecology of moonfish. There have been no assessments of the potential yield of moonfish. No biomass estimates have been made and it is not feasible to do so from existing data.

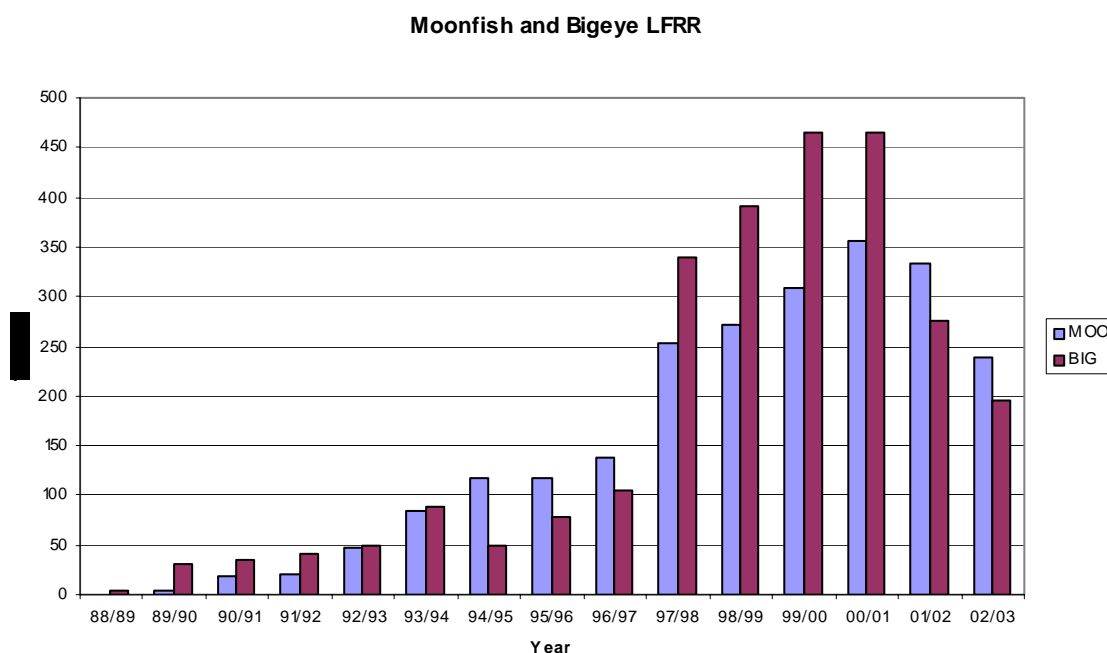
Fisheries Characteristics

Commercial catch

- 52 Most moonfish (70%) is caught as a bycatch of target fisheries using surface longlines. The main target fisheries catching moonfish by surface longlining are bigeye tuna and, to a lesser extent, southern bluefin tuna, albacore and yellowfin tuna. The main target fisheries using midwater trawling are southern blue whiting and hoki, and bottom trawling for hoki and gemfish.
- 53 Most moonfish catch is retained and landed as there is a market demand. It is likely that landing data for moonfish reasonably represents actual catches, although it may include small amounts of opah, because of misidentification.
- 54 Moonfish catch appears to most closely follow bigeye tuna catch (Figure 2). Most moonfish are caught by surface longlining (70%), and most of this longline catch is associated with bigeye tuna (79%).

¹ www.fishbase.org

Figure 2: Relative reported catch of Moonfish and bigeye tuna for the period 1989-2003. (LFRR returns)



55 Between 1989-90 and 1998-99, reported landings in New Zealand increased each year from 2 to 278 tonnes (refer Table 1). Over the last three fishing years, landings have averaged around 309 tonnes. The New Zealand landings of moonfish appear to represent about 70% of the reported catch of moonfish in the wider South Pacific area based on Food and Agriculture Organisation of the United Nations statistics.

Table 1: Reported landings (tonnes) of moonfish by FMA (CELR landed and CLR)

FMA	1	2	3	4	5	6	7	8	9	10	Total includes unknown
1989-90	1	1	0	0	0	<1	<1	0	0	0	2
1990-91	13	3	<1	0	<1	0	2	0	0	0	18
1991-92	22	1	0	0	<1	<1	2	0	0	<1	26
1992-93	37	5	0	<1	1	<1	2	<1	0	<1	46
1993-94	81	3	<1	0	<1	<1	3	<1	7	1	97
1994-95	87	10	<1	<1	1	<1	9	<1	2	2	112
1995-96	65	31	2	0	<1	<1	4	<1	<1	2	112
1996-97	111	12	<1	0	<1	1	3	<1	0	0	130
1997-98	190	27	<1	<1	<1	3	3	0	8	0	234
1998-99	233	22	<1	2	2	10	3	1	2	2	278
1999-00	249	36	<1	0	1	7	5	0	5	3	311
2000-01	281	45	1	2	3	3	7	<1	4	4	351
2001-02	255	65	1	<1	1	5	6	1	3	4	342
2002-03	151	53	<1	<1	1	2	3	5	10	5	239

Catch by method

- 56 Most moonfish (70%) is caught as a bycatch of target fisheries using surface longlines. Midwater trawling accounts for 18%, bottom trawling 8% and bottom longlining 1%.

Number of vessels catching and landing

Table 2: Number of landings of moonfish by vessel for fishing years 1990-91 to 2002-03

	Fishing year ^a													
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Vessels	9	11	17	33	50	81	74	65	81	110	137	167	183	165

^aFishing year '1990' is fishing year 1989-90

- 57 The number of vessels catching and landing moonfish shows a steep increase over the past decade.

Recreational catch

- 58 There is no information on recreational catch levels of moonfish. Moonfish has not been recorded from recreational surveys conducted by MFish in recent years.

Customary catch

- 59 There is no information on customary catch, although customary fishers consider moonfish good eating and may have used moonfish in the past.

Fisheries Assessment

- 60 No fishery assessment is available for moonfish.

Associated Fisheries

- 61 Moonfish is primarily taken as a bycatch of tuna longline fishing in northern waters. Key associated fisheries are proposed for introduction into the QMS for 1 October 2004. The main target species of tuna longline fishing are bigeye tuna, southern bluefin tuna and albacore. Southern bluefin tuna and bigeye tuna are to be introduced into the QMS on 1 October 2004. Albacore will be proposed for introduction into the QMS on 1 October 2005.
- 62 Key bycatch species are swordfish, mako shark, blue shark, porbeagle shark, moonfish, Ray's bream and yellowfin tuna. These species are also to be introduced into the QMS on 1 October 2004.
- 63 There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of moonfish into the QMS may improve our ability to

address these issues by requiring the incorporation of any new information as it comes to hand in the process of determining catch limits for the fishery.

Environmental Issues

- 64 Harvesting of moonfish may have impacts with regard to predator/prey interactions and trophic dynamics, as moonfish feed on a variety of fish and other marine species. Understanding of food web relationships is still at an early stage, but MFish considers that, if evidence emerges of impacts on biodiversity from harvesting of moonfish, this can be managed by setting a TAC within the QMS or alternative management measures based on international cooperation where appropriate.
- 65 There is also a non-fish bycatch associated with the surface longline fishery. Fishing vessels sometimes capture seabirds that are chasing baited hooks, and the seabirds drown as the lines sink. Seabirds are also caught in trawl and other fisheries, but longliners are considered to be the main threat to several vulnerable albatrosses and other seabird species. The risks of seabird capture vary geographically and by species. An active programme is underway to mitigate and monitor the capture of seabirds in surface longline fisheries.
- 66 MFish has established standard environmental controls on line and trawl target fisheries to mitigate the impact of these fishing methods on seabirds. These include prohibitions on net sonde monitor cables and compulsory reporting of bycatch of protected species. New Zealand surface longline vessels are required to use tori lines of a specified standard. Vessels are using a variety of practices to reduce seabird bycatch including the use of artificial baits and the practice of setting longlines at night.
- 67 MFish and the Department of Conservation are developing a National Plan of Action (NPOA) for Seabirds that is expected to include measures that will apply to all New Zealand fishing vessels.

Research

- 68 A research project on the productivity of important non-target species caught in the tuna longline fisheries is underway and is due for completion in 2004. One specific objective is to determine the growth rate, age at maturity, longevity and natural mortality of moonfish.

Social, Cultural, and Economic Factors

Customary and social importance

- 69 There are no known recreational or Māori customary fisheries for moonfish.

Economic importance

- 70 Moonfish is a bycatch of the valuable tuna fisheries, MFish considers that the TACC options recommended for moonfish will not constrain these fisheries in the short-term.

MOONFISH (MOO) – FINAL ADVICE

Initial Proposal

- 1 The initial position paper (the IPP) proposed the following two options for a TAC (including allowances for customary fishing interests, recreational interests and TACC) for the moonfish (*Lampris guttatus*) stock being introduced into the QMS on 1 October 2004 (refer Table 1). The MFish preferred option was a TAC of 527 tonnes.

Table 1: Proposed TACs (in tonnes), TACCs and other allowances for the moonfish stock (no allowances have been made for other sources of fishing-related mortality):

Stock	TAC	Customary Allowance	Recreational Allowance	TACC
MOO 1	439	0	0	439
OR				
MOO 1	527	0	0	527

- 2 This proposal was part of a package of measures regarding the introduction of moonfish into the QMS. Other measures *proposed* for this stock were:
- a) Recommending moonfish be included on the Third Schedule of the Fisheries Act 1996, so that moonfish can be managed with an alternative TAC set pursuant to section 14 of the Act;
 - b) Amending the Fisheries (Reporting) Regulations 2001 to ensure that the appropriate fishstock code for moonfish is used under the QMS for reporting moonfish; and
 - c) Setting a deemed value of \$0.50/kg but no overfishing threshold or differential deemed value for moonfish.

Submissions

- 3 Submissions were received on the moonfish proposal from **Te Rūnanga o Ōtākou, Te Ohu Kai Moana (TOKM)**, **New Zealand Seafood Industry Council (SeaFIC)**, the **Tuna Management Association of New Zealand Incorporated (TMANZL)**, **Solander** and **Sanford Limited**, which supported the SeaFIC submission on moonfish.

Biological and Fishery Information

Submissions

- 4 No submissions were received on biological and fishery information for moonfish. The IPP contains a discussion of such information (refer IPP Annex One).

MFish response

- 5 MFish confirms its view on the biological and fishery information for moonfish provided in the IPP (refer IPP Annex One).

Environmental Considerations

Submissions

- 6 No submissions were received on the environmental considerations relating to the setting of sustainability measures for moonfish outlined in the IPP at para 64-67.

MFish response

- 7 MFish confirms its view on the environmental considerations relating to the setting of sustainability measures for moonfish outlined in the IPP at para 64-67.

TACs, Allowances and TACC setting considerations

Submissions

- 8 **SeaFIC** supports the second option for a TAC of 527 tonnes. The **TMANZL** and **Sanford Limited** support SeaFIC's submission.
- 5 **TOKM** also support the second option of 527 tonnes for MOO 1. They stress this level must be kept under review and possibly adjusted as tuna catch increases.
- 6 **Solander** supports, in principle, the concepts in the IPP for bycatch species, with questions relating to allocation (see paragraphs 8-10).
- 7 **Te Runanga o Otakou (Inc)** submit that pursuant to the settlement Act the Minister of Fisheries is required to develop policies to help recognise the use and management practises of takatā whenua in the exercise of customary non-commercial fishing rights. Te Runanga o Otakou (Inc) propose that a minimum non-commercial allowance of 25% of the TAC is set for all species proposed for introduction into the QMS of which 80% should be made available for customary Maori fishing. Te Runanga o Otakou (Inc) submit that a customary allocation does not require a harvest to be deemed to be utilised traditionally.

MFish Discussion

- 8 MFish's rationale for the proposed moonfish TAC and TACC is contained in the IPP (refer IPP paragraphs 10-24). MFish prefers the second TAC option of 527 tonnes, as supported by those making submissions. A TAC at this level is considered to be sustainable and is least likely to constrain target tuna fisheries of which moonfish is a bycatch.
- 9 MFish notes the view of Te Runanga o Otakou (Inc) but concludes that a standard approach to setting allowances in the manner suggested is not appropriate. Rather a case-by-case consideration is indicated. In this case there is no known non-commercial fishery for moonfish and no allowances were proposed. There is no new information to suggest that this position should change. No allowance was proposed for other sources of fishing related mortality and no submissions suggest that this should be changed.

- 10 MFish therefore confirms its view that the TAC and TACC for moonfish should be set at 527 tonnes.

Social, Cultural and Economic Factors

Submissions

- 11 **Solander** believes no TAC or TACC can be set without addressing the bycatch allocation issue.
- 12 **SeaFIC** also raises the issue of bycatch allocation, as they feel the perceived lack of opportunity to secure adequate quota will constrain the development opportunity of tuna fisheries.
- 13 The **Tuna Management Association of New Zealand Incorporated** is concerned that fishers get their “true recent by-catch”.

MFish Discussion

- 14 MFish notes that the mismatch in catch history periods for tuna and bycatch species is subject to a separate review and does not relate to the setting of sustainability measures. This issue is addressed further in the generic section of this advice paper.

Other Management Measures

Submissions

- 15 **TOKM** considers moonfish should be added to the Sixth Schedule on the same conditions as blue shark
- 16 **SeaFIC** suggests that all highly migratory stocks, regardless of size, should be listed on the Sixth Schedule to provide flexibility to fishers in managing catch against annual catch entitlement.

MFish Discussion

- 17 MFish considers that the Sixth Schedule is a management tool for addressing specific fisheries management issues, otherwise the general rule remains that fishstocks in the QMS are to be landed and recorded against annual catch entitlement. MFish has recommended the inclusion of pelagic shark species on the Sixth Schedule for safety and conservation purposes, and southern bluefin tuna to mitigate the carryover effects of over-catching the TACC in one year and a subsequent requirement to reduce the TACC for the following year. Moonfish is not subject to either of these constraints at this time.
- 18 Submissions were silent on the addition of moonfish to the Third Schedule of the 1996 Act. MFish confirms its view that this is an appropriate course of action for this species. While moonfish is not legally defined as a highly migratory species, it is a wide-ranging oceanic pelagic species and for this reason MFish does not consider that it is possible to estimate MSY for this species. The inclusion of moonfish on the Third Schedule is the subject of separate advice.

Deemed Values and Overfishing Thresholds

MFish initial position

- 19 MFish proposed that moonfish was a low knowledge stock for the purpose of setting a deemed value and in this case deemed values would normally be proposed at 60% of the port price and no differential value or overfishing threshold would apply. In the absence of a port price for moonfish at the time of preparing the IPP, a nominal deemed value of \$0.50 was proposed.

Submissions

- 20 **SeaFIC** oppose the deemed value of \$0.50/kg, and believes in the absence of more information it should be no more than \$0.10/kg or \$0.15/kg.
- 21 **TOKM** question how the deemed value was calculated and why MFish considers the SeaFIC port price of \$100/metric tonne may be too low. They proposed the annual deemed value be set at \$0.15/kg with no differential rate or overfishing threshold.

MFish Discussion

- 22 There are no known sustainability concerns for moonfish and MFish has proposed prospective catch limits for this species. MFish does not wish to impose unreasonable constraint on fishers particularly during a period of rationalisation of the tuna longline fishery.
- 23 The TACC proposed should be sufficient to satisfy demand in the fishery for bycatch. In this environment MFish considers that a deemed value for moonfish should be on the lower end of the continuum between port price and the transaction costs involved in acquiring and or holding a quantum of ACE. This will also reduce the potential for deemed values to distort the market for ACE during the period of transition of moonfish into the QMS.
- 24 For this reason, while MFish notes that in the IPP it was proposed that a deemed value should be set at 60% of the port price for moonfish MFish now proposes that deemed values are set at a lower level. In the absence of recent port price information a nominal deemed value of \$0.50/kg for moonfish was suggested in the IPP. A port price of \$1.95/kg has now been determined for moonfish. MFish acknowledges that the deemed value level should be linked more appropriately to the ACE value but this value is not known at this time. Therefore, MFish proposes to retain the deemed value proposed in the IPP (\$0.50/kg), which now represents 25% of the port price but is above the likely transaction and levy costs anticipated for this fishery.

Legal Obligations

- 25 The statutory considerations that must be taken into account when setting a TAC and allowances for moonfish were identified in the IPP (refer to IPP paragraphs 36-47). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Conclusion

- 26 MFish recommends that a TAC and a TACC for moonfish are set at 527 tonnes. This option is supported by all submitters and represents a level of catch 50% greater than the best year's reported landings. A TAC and TACC at this level is intended to provide opportunities for expansion in the fishery and be non-constraining on the tuna target fisheries.
- 27 Submissions opposed the proposed deemed value of \$0.50/kg for moonfish proposed in the IPP in the absence of port price information. A port price for moonfish is now available however MFish recommends retaining the nominal deemed value proposed which is 25% of the new port price.
- 28 MFish do not believe that there are any special circumstances that warrant including moonfish in the Sixth Schedule as suggested in submission.

Recommendations

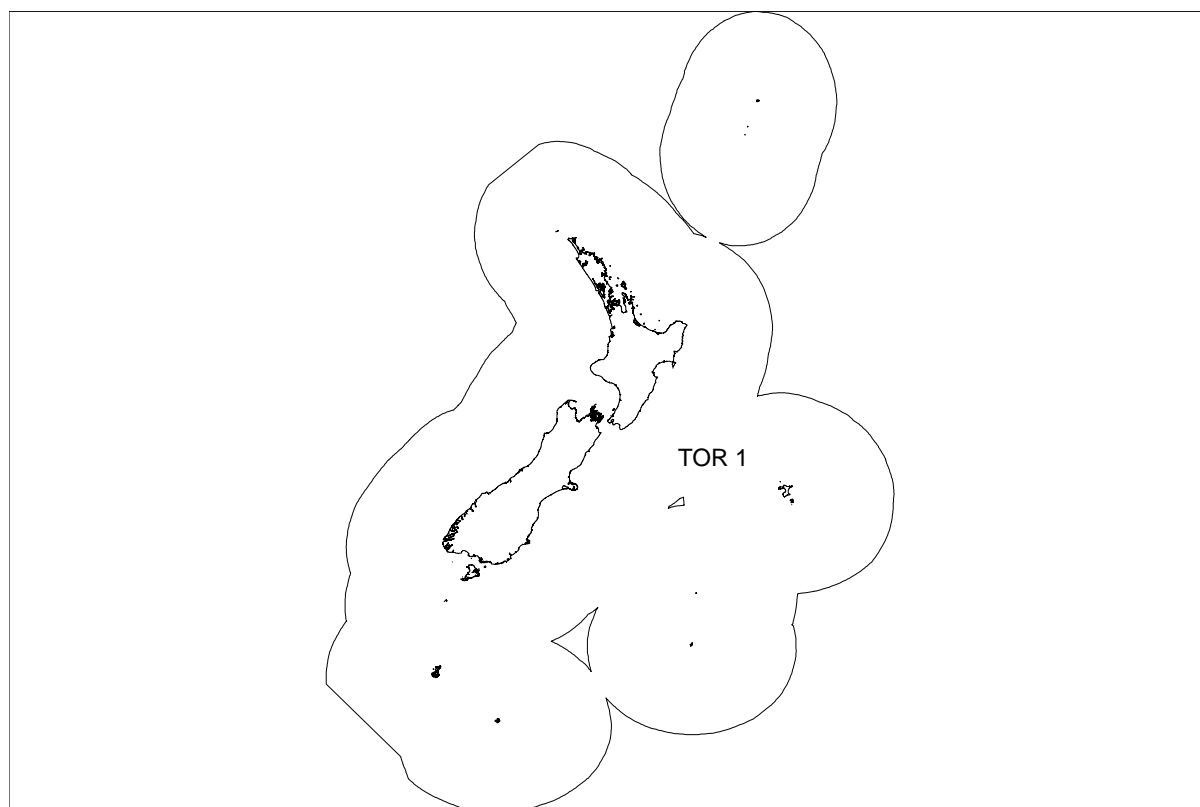
- 29 MFish recommends that you:
- a) **Agree** that the purpose of the Act is better achieved by setting a TAC otherwise than in accordance with s 13(2) for moonfish.
 - b) **Agree** to set a TAC for moonfish pursuant to s 14 of the Act.
 - c) **Agree** to set a TAC of 527 tonnes for MOO 1, and within this set:
 - i) A customary allowance of 0 tonnes,
 - ii) A recreational allowance of 0 tonnes,
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality, and
 - iv) A TACC of 527 tonnes.
 - (d) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to prescribe a code for moonfish to be used by commercial fishers when completing their statutory catch returns.
 - (e) **Agree** to set an annual deemed value for moonfish of \$0.50/kg.

PACIFIC BLUEFIN TUNA (TOR) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Pacific bluefin tuna (*Thunnus orientalis*) has been gazetted for introduction into the QMS on 1 October 2004. The Quota Management Area (QMA) for Pacific bluefin tuna, shown in Figure 1, includes all New Zealand fisheries waters (FMAs 1-10). The fishing year for Pacific bluefin tuna will be from 1 October to 30 September in the following year. The total allowable commercial catch (TACC) and annual catch entitlement (ACE) are to be expressed in terms of kilograms greenweight.

Figure 1: Quota Management Area for Pacific bluefin tuna



Key Issues to be considered

- 2 The key issues to be considered in relation to the setting of a TAC, allowances and TACC for Pacific bluefin tuna are:
 - a) Pacific bluefin tuna was previously considered to be a sub-species of northern bluefin tuna but is now considered to be a separate species;
 - b) Current understanding is that Pacific bluefin tuna form a single stock throughout the Pacific Ocean;

- c) Total catches for the stock range from 9 000 to 24 000 tonnes, the majority of which is caught as juveniles by purse seine fishing in the northwestern Pacific;
- d) There are no known sustainability concerns with the Pacific bluefin tuna stock, however, current information suggests that yield from the fishery could be improved by reducing the proportion of juveniles harvested from the stock;
- e) New Zealand catches of Pacific bluefin tuna are small (up to 55 tonnes annually) and this species is currently taken primarily as a bycatch of tuna longline fishing for southern bluefin tuna and bigeye tuna;
- f) There is considered to be development potential for Pacific bluefin tuna in New Zealand fisheries waters;
- g) There is no known non-commercial catch of Pacific bluefin tuna in New Zealand fisheries waters; and
- h) The correct identification of large tunas remains an issue, in particular the distinction between southern and Pacific bluefin tuna. This will require compliance monitoring in a QMS environment.

List of Management Options

- 3 It is proposed to add Pacific bluefin tuna to the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
- 4 The proposed options for a TAC, TACC and allowances for Pacific bluefin tuna are as follows:

Table 1: Proposed TAC, TACC, and allowances for Pacific bluefin tuna, TOR 1 (tonnes).

Option	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
Option 1	70	0.5	1	1.5	67
Option 2#	83	0.5	1	1.5	80

Note: TAC options are based on the best annual commercial catch in the most recent five years plus 25% OR plus 50% with the addition of allowances.

MFish preferred option

- 5 It is further proposed to:
 - a) Amend reporting regulations to take account of the decision to set a single QMA for Pacific bluefin tuna;
 - b) Set a deemed value of \$11.54 per kg for Pacific bluefin tuna; and
 - c) Apply differential deemed values

TACS allowances and TACCs

TAC management strategy

- 6 Section 14 of the 1996 Act provides an exception to setting a TAC based on an assessment of MSY where the Minister is satisfied that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2).

- 7 It is not possible to estimate MSY for the part of the Pacific bluefin tuna stock that is found within New Zealand fisheries waters. This is one of the criteria for the inclusion of a stock on the Third Schedule (s 14(8)).
- 8 It is proposed that a TAC for Pacific bluefin tuna is set pursuant to s 14 of the 1996 Act. While any TAC must be set in a way that ensures use of the stock is sustainable, there is no requirement under s 14 to take into account or be guided by the need to manage in accordance with MSY. A TAC set under s 14 of the Act must be set in a way that better achieves the purpose of the 1996 Act. MFish believes that a TAC set under the provisions of s 14 of the 1996 Act can better provide for utilisation (developing fisheries to enable people to provide for their social, economic and cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters, whilst at the same time ensuring sustainability.
- 9 Further, s 14 provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

Rationale for proposed TACs

- 10 In the absence of estimates of sustainable catch, a TAC is proposed that is based on current utilisation and allowances. The best annual catch of Pacific bluefin tuna in recent years is 53.3 tonnes. Comment from fishers indicates that catches of Pacific bluefin tuna may have been constrained as fishers spend a proportion of their time within a fishing year competing for southern bluefin tuna. The potential of the Pacific bluefin tuna fishery within New Zealand fisheries waters has not been fully explored.
- 11 There are no international assessments to suggest any sustainability concerns with this species, however New Zealand has an obligation to exercise reasonable restraint in the development of its fisheries for highly migratory species (resolutions of the Preparatory Conference for the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific). In this context MFish does not consider that it is unreasonable to provide for expansion in the level of the Pacific bluefin tuna fisheries within New Zealand coastal waters. Policy guidelines suggest that the opportunity for development and the extent of utilisation provided for needs to be assessed on a stock-by-stock basis having regard to risk based on the following factors:
- 12 **Sustainability of the stock**, for Pacific bluefin tuna the risk is considered low. The New Zealand contribution to the catch for the stock as a whole is not significant (less than 0.5%).
- 13 **Biology of the stock and potential for local depletion**, for Pacific bluefin tuna this risk is considered to be low. The New Zealand fishery is based on large adult fish, which are likely to be free ranging.
- 14 **Impacts of fishing on the aquatic environment including bycatch**, for Pacific bluefin tuna this is a factor of moderate risk. Pacific bluefin tuna is taken in conjunction with other large tuna species including southern bluefin tuna and any increase in catch creates some risk that southern bluefin tuna may be caught over and above the catch limit set for this species. There is also an unquantified risk to the

viability of associated and dependent species which is method rather than species dependent.

- 15 **Socio economic and cultural issues**, with regard to Pacific bluefin tuna there are no specific issues other than the clear benefits from increased revenue to the fishery if an expansion in catch can be realised and sustained.
- 16 **Anecdotal information on abundance and size of likely habitat in the management area**, for Pacific bluefin tuna the extent of the habitat within New Zealand fisheries waters is unknown. Anecdote suggests that the potential of the fishery has yet to be realised.
- 17 On balance, the risks associated with an increase in catch of Pacific bluefin tuna are considered to be low to moderate and within manageable bounds. MFish therefore proposes to set a prospective TAC for Pacific bluefin tuna. Two options are proposed:
 - Option One: 70 tonnes
 - Option Two: 83 tonnes
- 18 The choice of options is dependent on the level of risk associated with the development of the fishery. MFish has not proposed options higher than a 50% increase on the best years catch until more is known about the distribution of Pacific bluefin tuna in New Zealand fisheries waters and the potential interactions with other target and non-target species. However, MFish considers that the risks associated with the higher of the TAC options proposed are manageable and provide more opportunity for the development of what is considered to be an under-utilised fishery. The MFish initial preference is for a TAC of 83 tonnes.
- 19 MFish notes that there is provision for an in season increase in TAC if the abundance of Pacific bluefin tuna in any fishing year suggests that more may be taken. Any in season increase is given effect through the creation of ACE pursuant to s 68 of the 1996 Act.
- 20 Further, the annual TAC and TACC is subject to review based on the performance of the fishery. If the TAC proves to be limiting the development of the fishery (eg, it is consistently fully caught) then there is an annual opportunity to consider proposals for a TAC increase.

Proposed allowances and TACC

Customary Māori and recreational allowances

- 21 A nominal allowance is proposed for customary Māori and recreational fishing. There is no known recreational catch of Pacific bluefin tuna. This species is the least abundant (based on current reported commercial catch) of the large tuna species taken in New Zealand fisheries waters and it is not likely to be taken by recreational fishers in any numbers. It is likely that those Pacific bluefin tuna taken in the recreational fishery are large fish. A nominal allowance of 1 tonne is therefore proposed for recreational fishing interests.

- 22 There is no known catch of this species by customary Māori fishers nor is it known to be a species of particular significance to Māori. An allowance based on 50% of that for recreational fishing interests (0.5 tonnes) is therefore proposed

Allowances for other sources of mortality

- 23 Observer information on the level of discarding of Pacific bluefin tuna is not available. Estimates of discards range from 1% to 6.1% of the catch for other tuna species. A proportion of the fish are discarded as a result of damage. In the absence of specific estimates for Pacific bluefin tuna an allowance of 2% of the TACC is proposed for other sources of mortality for fish that are lost before landing on board the vessel.

TACC

- 24 Two options for TACC are proposed:
- Option One: 67 tonnes.
 - Option Two: 80 tonnes.
- 25 MFish assess that the level of risk associated with the higher TAC option proposed is manageable and the adoption of this option and associated TACC (80 tonnes) is the MFish preferred initial position.

Other management measures

- 26 Specific measures are proposed in respect of:
- Providing for inclusion of Pacific bluefin tuna on the Third Schedule (by Order in Council) as a species for which it is not possible to estimate MSY;
 - Making consequential amendment to the fisheries reporting regulations; and
 - Setting a deemed value for Pacific bluefin tuna.
- 27 The ability of fishers to correctly distinguish between Pacific bluefin tuna and southern bluefin tuna remains an issue and will be monitored over time. If necessary a regulatory regime to institute a formal process for identification of Pacific bluefin tuna landings could be considered.

Inclusion of Pacific bluefin tuna on the Third Schedule

- 28 MFish proposes that Pacific bluefin tuna be added to the Third Schedule of the 1996 Act.
- 29 Pacific bluefin tuna is a highly migratory species caught in New Zealand waters but part of a stock that includes the entire Pacific. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. One of the criteria for inclusion of a stock on the Third Schedule is therefore satisfied.
- 30 Section 14 of the Act requires that species managed under s 14 be listed on the Third Schedule of the 1996 Act by Order in Council. Section 14 of the 1996 Act provides

for the setting of an alternative TAC if the purpose of the Act is better achieved than by setting a TAC pursuant to s 13(2).

Consequential amendment to regulations

- 31 As a consequence of the introduction of Pacific bluefin tuna into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are included in a generic section of this document.

Deemed values and overfishing thresholds

- 32 A separate section of this document sets out generic information on the setting of interim and annual deemed values.
- 33 Pacific bluefin tuna is a high value species. MFish considers that, despite the high value of this species, the best fit for Pacific bluefin tuna is the category of all other stocks, for which the deemed value would be set at 75% of port price. There are no known sustainability concerns for Pacific bluefin tuna that would necessitate a deterrent deemed value. The potential for individuals to enter the fishery without ACE is addressed by the proposal to apply differential deemed values for Pacific bluefin tuna
- 34 A port price for Pacific bluefin tuna has not been determined, therefore MFish proposes to use the port price for bigeye tuna which is \$15.38. An annual deemed value for Pacific bluefin tuna of \$11.54 is therefore proposed. The application of differential deemed values would see this amount increase in proportion to an individuals catch in excess of ACE.
- 35 MFish does not propose to set an overfishing threshold for Pacific bluefin tuna unless monitoring of catch against the TACC suggest that this is required in the future.

Statutory considerations

- 36 The management options presented for Pacific bluefin tuna seek to achieve the purpose of the 1996 Act (s 14) by providing opportunity for further unitisation (development) within what might be a sustainable catch of this species within New Zealand fisheries waters. The proposals are considered to be consistent with New Zealand's international obligations in relation to fishing (an obligation to exercise reasonable restraint in the development of the fishery (s 8)) and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5).
- 37 The fishery for Pacific bluefin tuna is as a bycatch of targeting other more abundant tuna species such as bigeye and southern bluefin tuna. A wide range of fish species are taken as bycatch of surface longline fishing. Catch levels vary but many of these species are only rarely taken. The main fish bycatch species associated with the surface longline fishery within New Zealand fisheries waters are to be introduced into the QMS. The QMS will provide the mechanisms for sustainability actions as required (ss 9(a) and (b)).

- 38 There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of Pacific bluefin tuna into the QMS will improve our ability to address these issues by requiring the incorporation of new information as it comes to hand in the process of determining catch limits for the fishery.
- 39 There are known effects of tuna longline fishing on the aquatic environment (seabirds) but steps have been and continue to be taken to mitigate these risks (refer Annex One (s 9(b))).
- 40 Tuna longlining is not known to pose a risk to benthic habitat of particular significance to fisheries management. The pelagic habitat, however, and any associated risks of fishing are poorly understood (s 9(c)).
- 41 Pacific bluefin tuna is not known to be a highly variable stock however it is not known how the availability of this species within New Zealand fisheries waters varies on an annual basis (s 11(1)(c)).
- 42 Before setting any sustainability measure, the Minister must have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, and any management strategy or management plan under the Conservation Act 1987 that applies to the coastal marine area and is considered to be relevant by the Minister. MFish is not aware of any provisions in any strategy or planning document under the Resource Management Act or Conservation Act that are relevant to the setting of sustainability measures for Pacific bluefin tuna (ss 11(2)(a) and (b)).
- 43 Similarly, before setting any sustainability measure relevant to the Hauraki Gulf (eg, a TAC for the Pacific bluefin tuna), the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000 Act. The Hauraki Gulf is defined in that Act to include all coastal waters and offshore islands from near Te Arai Point offshore to the Moko Hinau Islands, and south to Homunga Point (north of Waihi Beach). This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. Pacific bluefin tuna is not known to occur within the boundaries of the Hauraki Gulf Marine Park and the setting of a TAC for Pacific bluefin tuna is not considered to impact upon the objectives of the Park (s 11(2)(c)).
- 44 Before setting any sustainability measure, the Minister must also take into account any conservation services or fisheries services, any relevant fisheries plan approved under the Act, and any decisions not to require conservation services or fisheries services. There are no relevant fisheries plans approved that would have any bearing on the setting of a TAC for Pacific bluefin tuna. Conservation and fisheries services apply to tuna fisheries generally in order to assess and monitor the impacts of fishing on non-target fish and non-fish species. Further there have been no decisions not to require conservation services or fisheries services (s 11(2)(a)).

- 45 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaimai reserves exist within TOR 1 the values of the mātaimai will not be compromised, as Pacific bluefin tuna are an oceanic stock. No area has been closed or fishing method restricted for customary fishing purposes in TOR 1 that would affect the fishery. No restrictions have been placed on fishing in any area within the TOR 1 for recreational interests (s 21(4) and (5)).
- 46 The information used to develop proposals for Pacific bluefin tuna relies on overseas assessments of the stock (which are uncertain) and information from commercial catches, which is limited with respect to evaluating levels of sustainable harvest. MFish notes however that uncertainty in information is not a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act.

Preliminary recommendations

- 47 MFish recommends that the Minister:
- a) **Agrees** that the purpose of the 1996 Act is better achieved by setting a TAC for Pacific bluefin tuna otherwise than in accordance with s 13(2) of the 1996 Act.
 - b) **Agrees** that Pacific bluefin tuna is added to the Third Schedule and a TAC is set pursuant to s 14 of the 1996 Act.
 - c) **Agrees** to set a TAC for Pacific bluefin tuna of 83 tonnes and within this set:
 - i) A customary allowance of 0.5 tonnes;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1.5 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 80 tonnes.
 - d) **Agrees** to set a deemed value for Pacific bluefin tuna of \$11.54 per kg.
 - e) **Agrees** that differential deemed values apply.
 - f) **Agrees** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

ANNEX ONE

Species information

Species biology

- 48 Pacific bluefin tuna is distributed throughout the Pacific Ocean. In the absence of information to the contrary it has been assumed that there is a single stock of Pacific bluefin tuna¹. Larvae of Pacific bluefin tuna have been found only between the Philippines and southern Japan in the Sea of Japan and it is assumed that spawning occurs only in these areas.
- 49 Pacific bluefin tuna was previously considered to be a sub-species of Northern bluefin tuna. It is now accepted, both nationally and internationally that Pacific bluefin tuna (*Thunnus orientalis*) and northern bluefin tuna (*Thunnus thynnus*) are in fact two separate species.

Fisheries characteristics

Commercial catch

- 50 Reported catches from New Zealand waters are shown below in Table 2. These are based on the assumption that catch previously reported as northern bluefin tuna was in fact Pacific bluefin tuna. Pacific bluefin tuna is caught around both islands of New Zealand by tuna longlining when bigeye tuna or southern bluefin tuna is the target species. Catches have increased progressively since the start of domestic tuna longlining in the early 1990s. Although catches are small (about 45 tonnes in 2000–01) higher catches have been made by foreign licensed longliners in the early 1980s and Pacific bluefin tuna has been a regular longline catch in the Australasian region since 1952.
- 51 Both the catch and the distribution of catches most likely reflect the distribution of target fisheries for bigeye and southern bluefin tuna. It is not yet known whether fishing in other areas and/or at other times can increase catches of Pacific bluefin tuna.

¹ Bayliff W H. Status of bluefin tuna in the Pacific Ocean.

Table 2: Catch history of Pacific bluefin tuna in NZ by fishing year and FMA (NTU and TOR combined) (tonnes)

Fish Yr	FMA 1	FMA 2	FMA 3	FMA 4	FMA 5	FMA 6	FMA 7	FMA 8	FMA 9	FMA 10	ET	U	Total
NZ Domestic & Charter fleets													
1988-89	0	0	0	0	0.1	0	0	0	0	0	0		0.1
1989-90	0.1	0.9	0	0	0	0	0.2	0	0	0	0		1.2
1990-91	1.1	0.2	0	0	0	0	0	0	0	0	0		1.3
1991-92	0.3	0.9	0	0	0	0	0	0	0	0	0		1.5
1992-93	2.2	0.6	0	0	0	0	0.2	0	0.3	0	0		2.9
1993-94	1.1	0.5	0	0	0	0	0	0	0	0	0		1.8
1994-95	1.4	0.5	0	0	0	0	0	0	0.2	0	0		1.9
1995-96	1.5	6.5	0	0	0	0	0.1	0	0	0	0		8.1
1996-97	8.4	3.7	0	0	0	0	0.1	0	0	0	0	0.3	12.6
1997-98	12.1	6.3	0	0	1	0	0.7	0	0	0	0.4		22.8
1998-99	11.2	5.2	0	0	0.6	0	0.6	0.3	2.4	0	0.1	0.2	20.8
1999-00	5.2	24.2	0.1	0	0	0	0.2	0.1	2.5	0.3	0.1	0.3	32.7
2000-01	13.1	24.7	0	0	0.1	0	0.3	0	2.2	0.4	1		44.8
2001-02									5.3				53.3*
2002-03													41.5*
Total	57.8	74.1	0.1	0	1.8	0	2.3	0.5	12.9	0.7	1.6	0.8	152.5
* LFRR totals													
Foreign licensed vessels (Japan)													
1979-80	0.1	0.4	0.3	0	0	0.7	0	0	0	0	0.2		1.8
1980-81		0.5	4.1	0.2	0	0.4	0	0	0	0.1	0		5.3
1981-82	21.2	80.8	2.1	0	0	0.3	0	0	2.3	3	0.1	0.4	110.2
1982-83	16.2	32.3	14	6.1	0	0	0	0	0.8	0.6	0.3	0.1	70.3
1983-84	14	30.6	0.6	0	0	0	0	0	0.6	1.2	0		47.1
1984-85	2.2	2.3	0.3	0	0	0.3	0	0	0.7	0.2	1		7
1985-86	1.9	2.6	0.3	0	0.4	0	0	0	0.4	0.1	0.3		5.9
1986-87	4	3.1	0.2	0	0.8	0.2	0	0	0.2	2.1	0.4		10.9
1987-88	5.8	6.1		0	1	0	0	0	0.3	0.3	0		13.6
1988-89	1.2	13.2	0.2	0	0	0	0	0	0.4	0.1	0		15.1
1989-90	1.9	11.8	0.1	0	0	0	0	0	0.1	0.7	0.4	0.1	15.1
1990-91	3	10.5	0.5	0	0.3	0	0	0	0	0.2	0		14.6
1991-92	2.5	4.7	0	0	0.4	0	0	0	1.5	0	0		9
1992-93	0.4	1.7	0	0	0	0	0	0	0	0	0		2
1994-95		0.1	0	0	0	0	0	0	0	0	0		0.1
Total	74.4	200.7	22.7	6.3	3	1.9	0	0	7.2	8.6	2.7	0.6	328.1

Recreational and customary catch

- 52 There are no estimates of non-commercial catch of Pacific bluefin tuna and no known non-commercial catch of this species. It is possible that past recreational catch of Pacific bluefin tuna has been incorrectly identified as southern bluefin tuna, however Pacific bluefin tuna is not known to be abundant in New Zealand waters and its offshore distribution suggests that there may be only a limited non-commercial catch of this species.

Regulatory framework

- 53 Regulations apply to the tuna longline method (minimum standards for seabird mitigation) and specific and general regulations apply if foreign owned fishing vessels are operated in the tuna longline fishery (Part 2 of the Fisheries (Commercial Fishing) Regulations 2000).

Fisheries assessment

- 54 Various indices of abundance for Pacific bluefin tuna (habitat and bluefin vessel indices) have been developed however none of these are considered to be entirely satisfactory². The total catch of Pacific bluefin tuna by all gear types has not declined and there is no indication of a decline in the fishery.
- 55 Pacific bluefin tuna is believed to become sexually mature at about five years of age and to have a maximum lifespan of 25 years. While the largest Pacific bluefin tuna on record was 555kg, the average weight of individuals caught in the commercial fishery is only 7kg³ because of the high proportion of Pacific bluefin tuna taken as juveniles in northern purse seine fisheries. Yield per recruit analysis suggests that greater yields could be achieved if catches of younger fish were reduced or eliminated (a reduction in purse seine effort). Pacific bluefin tuna taken in New Zealand waters are generally large adult fish.
- 56 Participating countries in the Preparatory Conference for the Commission for the Conservation of Highly Migratory Stocks in the Western and Central Pacific have urged states to exercise reasonable restraint in respect of any increase in fishing effort and capacity with regard to the reported status of highly migratory stocks. As yet there are no specific international obligations with regard to management of Pacific bluefin tuna.

Associated fisheries

- 57 In New Zealand waters Pacific bluefin tuna is primarily taken by surface tuna longline as a bycatch of targeting more abundant tuna species. The main target species of tuna longline fishing are bigeye tuna, southern bluefin tuna and albacore. A wide range of fish species are taken as bycatch of surface longline fishing. Catch levels vary but many of these species are only rarely taken. The main fish bycatch species associated with the surface longline fishery within New Zealand fisheries waters are to be introduced into the QMS.
- 58 Key bycatch species are swordfish, mako shark, blue shark, porbeagle shark, moonfish, Ray's bream and yellowfin tuna. These species are all to be introduced into the QMS on 1 October 2004.
- 59 There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species,

² Bayliff W H. Status of bluefin tuna in the Pacific Ocean.

³ Cascorbi A. 2002 Seafood Watch Report: Tunas Volume IV. Pacific bluefin tuna

biodiversity and protected species that will require monitoring and possibly future management action.

Environmental issues

- 60 Environmental issues are common to the fishing method rather than specific to fishing for Pacific bluefin tuna. There is a non-fish bycatch associated with the surface longline fishery. Fishing vessels sometimes capture seabirds that are chasing baited hooks, and the seabirds drown as the lines sink. Seabirds are also caught in trawl and other fisheries, but longliners are considered to be the main threat to several vulnerable albatrosses and other seabird species. The risks of seabird capture vary geographically and by species. An active programme is underway to mitigate and monitor the capture of seabirds in surface longline fisheries.
- 61 MFish has established standard environmental controls on line and trawl target fisheries to mitigate the impact of these fishing methods on seabirds. These include prohibitions on net sonde monitor cables and compulsory reporting of bycatch of protected species. New Zealand surface longline vessels are required to use tori lines of a specified standard. Vessels are using a variety of practices to reduce seabird bycatch including the use of artificial baits and the practice of setting longlines at night.
- 62 MFish and the Department of Conservation are developing a National Plan of Action (NPOA) for Seabirds that is expected to include measures that will apply to all New Zealand fishing vessels.
- 63 Harvesting of Pacific bluefin tuna may affect predator/prey interactions and trophic dynamics, as Pacific bluefin tuna feeds on a wide range of fish species, crustaceans, and squid. In the Western Pacific, fish species consumed include anchovy, sardine, saury, mackerels and small tunas such as skipjack. Understanding of food web relationships is still at an early stage. MFish considers that, if evidence emerges of impacts on biodiversity from harvesting of Pacific bluefin tuna, this can be managed at that time, based on international cooperation where appropriate.

Current and potential research

- 64 There is no current or proposed research for Pacific bluefin tuna. Observer coverage will be required to provide biological information on this species and catch and effort reporting will provide a basis for monitoring the distribution and size of catches from the fishery.

Social cultural and economic factors

- 65 Pacific bluefin tuna form an important and valuable bycatch of tuna longline fisheries. While there is currently no information to suggest that a target fishery exists in New Zealand waters, expansion in the catch of Pacific bluefin tuna in conjunction with the development of the bigeye target fishery will provide economic benefit to the nation.

PACIFIC BLUEFIN TUNA (TOR) - FINAL ADVICE

Initial Proposal

- 1 It was proposed to add Pacific bluefin tuna to the Third Schedule and set a TAC pursuant to section 14 of the Fisheries Act 1996 (the 1996 Act).
- 2 The proposed options for a TAC, TACC and allowances for Pacific bluefin tuna were as follows:

Table 1: Proposed TAC, TACC, and allowances for Pacific bluefin tuna, TOR 1 (tonnes).

Option	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
Option 1	70	0.5	1	1.5	67
Option 2#	83	0.5	1	1.5	80

Note TAC options are based on the best annual commercial catch in the most recent five years plus 25% OR plus 50% with the addition of allowances.

MFish preferred option

- 3 It was further proposed to:
 - a) Amend reporting regulations to take account of the decision to set a single QMA for Pacific bluefin tuna;
 - b) Set a deemed value of \$11.54 per kg for Pacific bluefin tuna; and
 - c) Apply differential deemed values.

Submissions

- 4 Submissions were received on the Pacific bluefin tuna proposals from the following submitters:
 - Seafood Industry Council (SeaFIC);
 - Sanford Limited;
 - Solander;
 - Te Ohu Kai Moana (TOKM); and
 - Te Rūnanga o Ōtākou.
- 5 The specific submissions on the proposals for Pacific bluefin tuna are summarised and addressed under the relevant headings below.

Biological and Fishery Information

Submissions

- 6 The submissions received did not raise any issues concerning the biological or fishery information for Pacific bluefin tuna provided in the IPP (refer paras 48-59).

MFish discussion

- 7 MFish confirms that its position remains as stated in the IPP. (ref paras 48-59)

Environmental Considerations

Submissions

- 8 No submissions were received on the environmental considerations relating to the setting of sustainability measures for Pacific bluefin tuna outlined in the IPP at para 60-63.

MFish discussion

- 9 MFish confirms that its position remains as stated in the IPP. (ref paras 60-63).

TAC management strategy

Submissions

- 10 Subject to its reservations regarding the entry of highly migratory species into the QMS, **TOKM** agrees that no attempt should be made to “manage” the fish found seasonally in New Zealand waters under the provisions of s 13 of the Act. To that extent TOKM agrees with the proposal to include all HMS on the Third schedule and set TACs pursuant to s 14.

MFish response

- 11 MFish confirms its view that the purpose of the 1996 Act is better achieved by setting a TAC for Pacific bluefin tuna otherwise in than in accordance with s 13(2) and that a TAC is set pursuant to s 14 of the 1996 Act.

TAC

Submissions

- 12 **TOKM** agrees to the proposal that TAC is based on 50% above highest reported recent commercial landings for the short term subject to the limits being kept under regular review and corrections applied as the fishery develops.
- 13 **Solander** assume that the TAC suggested by MFish has a sufficient threshold to ensure that there is no scaling back of provisional catch history for this species. Solander submit that any scaling back to accommodate allocation to Maori and other

allowances would be unfair given the arbitrary nature of the catch limits. On the basis that its assumption is correct Solander supports MFish's recommendation on the TAC.

- 14 **SeaFIC** place a reservation on its support of the proposed TACs for tuna species. SeaFICs support of the recommended TACs is conditional on the capacity of the TAC to satisfy people's provisional catch history after accommodating all the requisite allowances and provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.
- 15 **SeaFIC** supports the MFish preferred option, which is a TAC of 83 tonnes.

MFish response

- 16 The Solander assumption regarding no scaling back of provisional catch history is not correct. Based on provisional PCH figures, the preferred TAC/TACC option proposed in the IPP for Pacific bluefin tuna (Option Two) would see a 26.5% reduction (23 tonnes) in provisional catch history to fit within the TACC following the allocation of 20% of the TACC to Maori.
- 17 A TAC based on the sum of provisional catch history for Pacific bluefin tuna and allowances would be 112 tonnes. This would represent a TACC double (104%) the best year of catch in the fishery to date. There is as yet no indication that the fishery in New Zealand fisheries waters can support this amount of Pacific bluefin tuna catch.
- 18 In MFish advice to the Minister of Fisheries regarding the choice of catch history years a TACC of 1.5 times the best recent years catch was used as a reference point with which to model the impacts on current fishers (measured in terms of the likely reduction in provisional catch history) associated with the choice of years. The analysis was intended as a relative or comparative exercise with which to assess the impacts of the choices for setting catch history years. The analysis was based on provisional data, which included annual rather than sequential monthly data to assess the likely provisional catch history for individual fishers. The intention of the analysis was to identify an option that had the least rather than no impact on current fishers. It appears that industry may have incorrectly inferred from this analysis that no change in provisional catch history would occur with the setting of a TACC.
- 19 MFish has used the same approach to setting a TAC/TACC for Pacific bluefin tuna. MFish acknowledges that in providing an opportunity for development of the fishery beyond recent historical peak catches a factor of 1.5 times is arbitrary. It was intended to provide a balance between opportunity for expansion in the fishery and the international (voluntary) obligation to show reasonable restraint. The proposed TAC/TACC (Option Two) is optimised to reflect the best year of the recent five years and increased by fifty percent and is coupled with an intention on MFish's part to monitor and respond with a review of the TAC/TACC if required.
- 20 There will be an impact on individual fishers of a reduction in provisional catch history. Individual fishing plans will be reduced by 26.5% however this reduction will be on the best of the individual fishers recent years catch. MFish notes the views of TOKM that the TAC for Pacific bluefin tuna should be subject to regular review. If information from the fishery in the first years of fishing under the QMS suggests a

higher TAC is appropriate then MFish confirms that a review of TAC will be undertaken. In this circumstance any reduction in individual provisional catch history will be returned to fishers in proportion to their holdings.

- 21 Alternatively a TAC could be set that provides for a TACC that will accommodate both the allocation of 20% to Maori and the sum of provisional catch histories. As noted above the option to increase landings by 50% to set a TAC/TACC is arbitrary. The New Zealand catch of Pacific bluefin tuna is small relative to the Pacific wide catch and MFish considers that a higher TAC is unlikely to create sustainability issues for the stock as a whole. The fishery for Pacific bluefin tuna in New Zealand waters is relatively new. Until recently catches were constrained by requiring all bluefin tuna catches (southern and Pacific) to be counted against the catch limit for southern bluefin tuna because at that time it was considered to be difficult to distinguish between the species. Setting a higher TAC and in turn TACC would mitigate any potential economic impact on individual fishers and the risk that some fishing operations become unprofitable. MFish has therefore provided an alternative TAC option of 120 tonnes for your consideration.

Proposed allowances and TACC

Submissions

- 22 **Te Runanga o Otakou (Inc)** submit that pursuant to the settlement Act the Minister of Fisheries is required to develop policies to help recognise the use and management practises of takatā whenua in the exercise of customary non-commercial fishing rights. Te Runanga o Otakou (Inc) propose that a minimum non-commercial allowance of 25% of the TAC is set for all species proposed for introduction into the QMS of which 80% should be made available for customary Maori fishing. Te Runanga o Otakou (Inc) submit that a customary allocation does not require a harvest to be deemed to be utilised traditionally.
- 23 No other submissions were received on non –commercial allowances and the proposed allowance for other sources of fishing mortality. Submissions on the TACC and its relation to provisional catch history are addressed in the preceding TAC section.

MFish response

- 24 MFish notes the view of Te Runanga o Otakou (Inc) but concludes that a standard approach to setting allowances in the manner suggested is not appropriate. Rather a case-by-case consideration is indicated.
- 25 In the case of Pacific bluefin tuna there are no estimates of non-commercial catch of this species and small nominal allowances have been proposed. The setting of non-commercial allowances at the level proposed by Te Runanga o Otakou (Inc) for Pacific bluefin tuna (around 25 tonnes) is unrealistic given the distribution of the species in New Zealand fisheries waters. That is a non-commercial catch at this level is unlikely to be realised. This submission is addressed in further detail in the generic section of this advice.

- 26 MFish confirms its position outlined in the IPP that the allowances should be set for customary fishing interests (0.5 tonnes), recreational fishing interests (1 tonne) and other sources of fishing related mortality (1.5 tonnes OR 2.5 tonnes depending on the TAC decided).
- 27 MFish has proposed an alternative TAC option for your consideration which, based on initial provisional catch history figures, should provide for the 20% allocation to Maori without reduction to provisional catch history for individual fishers. Therefore two TACC options proposed. The first TACC option of 80 tonnes would reduce provisional catch histories by around 25%. The second TACC option of 116 tonnes should provide fully for provisional catch histories for Pacific bluefin tuna.

Other management measures

Submissions

- 28 **TOKM** agrees with the proposal to include all highly migratory species on the Third schedule.
- 29 **TOKM** proposed that Pacific bluefin tuna be added to the Sixth Schedule.
- 30 **SeaFIC** submit that the provisions of the Sixth Schedule should apply to all highly migratory species.
- 31 No other submissions were received.

MFish response

- 32 MFish confirms its view that:
- a) Pacific bluefin tuna is added to the Third Schedule (by Order in Council) as a species for which it is not possible to estimate MSY. A recommendation to this effect is contained in separate advice; and
 - b) Consequential amendments to the Fisheries (Reporting) Regulations 1999 are made to reflect the decision to introduce Pacific bluefin tuna into the QMS.
- 33 MFish did not propose that Pacific bluefin tuna is added to the Sixth schedule of the Act. The Sixth Schedule provides for the return to the sea of quota species.
- 34 As a general rule MFish considers that quota species once caught should be retained unless there are good reasons for an exemption. The use of the Sixth Schedule in the case of some highly migratory species has a specific rationale and is predicated on the fact that any fish released under the provisions of the Sixth Schedule is likely to survive. MFish has proposed the use of the Sixth Schedule for southern bluefin tuna and for pelagic sharks to address specific management issues. No such issues exist for Pacific bluefin tuna and MFish does not support the use of the Sixth Schedule for this species.

Deemed value and overfishing thresholds

Submissions

- 35 **TOKM** submit that Pacific bluefin tuna should be classed as a low knowledge species for deemed value purposes and that the annual deemed value be based on 60% of the port price for bigeye (subject to review for the 2005-06 year and efforts to establish a port price for this species). TOKM proposed that no differential deemed values or overfishing threshold apply.
- 36 **SeaFIC** submit that Pacific bluefin tuna should be classed as a low knowledge species for deemed value purposes and that the annual deemed value be based on 60% of the port price for bigeye. SeaFIC submit that no differential deemed value should apply.

MFish response

- 37 In the absence of port price information for Pacific bluefin tuna, MFish proposed a deemed value based on the port price for bigeye tuna (\$15.38). New information is now available. A port price has been determined for Pacific bluefin tuna for the 2003 year. The average port price across Pacific bluefin tuna stocks is \$37.00, a substantial increase over the assessed value used in the IPP. MFish considers that this is the best available information for setting a deemed value for Pacific bluefin tuna.
- 38 MFish proposed that Pacific bluefin tuna is assigned to the “all other fishstocks” category for which deemed values are assessed at 75% of port price and differential deemed values apply but no overfishing threshold. SeaFIC and TOKM submit that the “low knowledge” category should apply for Pacific bluefin tuna. In this case deemed values are assessed at 60% of port price and no differential deemed values or overfishing threshold applies.
- 39 The category of “low knowledge fishstocks” has a specific definition in the policy guidelines regarding the setting of deemed values as follows.
- 40 *These are fish stocks for which there is relatively little information on the fishery status and about which there are believed to be no sustainability concerns. Catches of these stocks prior to their introduction to the QMS were typically poorly recorded and, as a result, small TACCs were set when the fishery came into the QMS. In some cases this has led to a significant shortage of available ACE to cover catch, and in some cases considerable over-catch of the TACC.*
- 41 *For these stocks, it is appropriate to set balancing regime variables that encourage fishers to land any catch taken in excess of ACE, for a period, in order to improve the available information on the fishery. This additional information should allow a TACC to be set with greater confidence. It is proposed that stocks would be moved from the Low Knowledge category to the All Other category once MFish has more confidence in the TACC or after 5 years catch data has been collected—whichever is sooner. Once a stock is reclassified, the balancing regime variables would be adjusted to more strictly restrain catches within the available ACE.*
- 42 There is little to distinguish Pacific bluefin tuna from other tuna species in New Zealand fisheries waters with regard to the knowledge of the fishery.

Information on the scale and distribution of the fishery is derived solely from commercial catch reporting. Pacific bluefin are a valuable species and MFish does not consider that past catches would not have been landed and reported. Fishers will however face a reduction in provisional catch history with the TACC proposed and there is the potential for a shortage in available annual catch entitlement.

- 43 There are no known sustainability concerns with Pacific bluefin tuna and the setting of a TAC 50% higher than peak recent landings (or alternatively double recent peak landings) means that MFish has confidence that the TACCs would not be unnecessarily constraining on the fishery. MFish notes the potential economic impacts of one of the TACCs proposed on individual fishers but does not accept submissions that Pacific bluefin tuna be assigned the “low knowledge fishstocks” category.
- 44 MFish therefore recommends a deemed value is set based on 75% of the port price (\$37.00) and that differential deemed values but no overfishing threshold apply. The deemed value recommended is \$27.75 per kg.

Legal Obligations

- 45 The statutory considerations that must be taken into account when setting a TAC and allowances for Pacific bluefin tuna were identified in the IPP (refer to IPP paras 36-46). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Recommendations

- 46 MFish recommends that you:
- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for Pacific bluefin tuna otherwise than in accordance with s13(2) of the 1996 Act.
 - b) **Agree** that a TAC for Pacific bluefin tuna is set pursuant to s14 of the 1996 Act.
 - c) **Agree** to set a TAC for Pacific bluefin tuna of 83 tonnes and within this set:
 - i) A customary allowance of 0.5 tonnes;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1.5 tonnes for other sources of fishing mortality;
 - iv) A TACC of 80 tonnes;
 - v) **Note** that the TAC proposed will result in a reduction in fishers individual provisional catch histories for Pacific bluefin tuna; and
 - vi) **Note** that the reduction in provisional catch history will have an economic impact on the fishing operations of some fishers.
- OR**
- d) Agree to set a TAC for Pacific bluefin tuna of 120 tonnes and within this set:

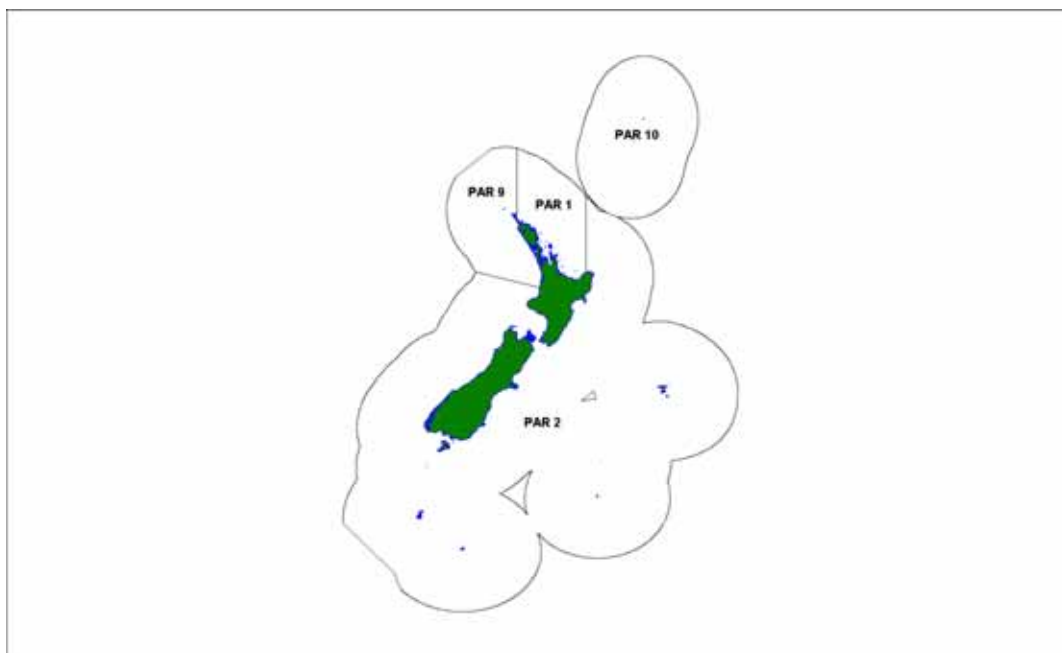
- i) A customary allowance of 0.5 tonnes;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 2.5 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 116 tonnes.
- e) **Agree** to set a deemed value for Pacific bluefin tuna of \$27.75 per kg.
 - f) **Agree** that differential deemed values apply.
 - g) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

PARORE (PAR) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Parore (*Girella tricuspidata*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Areas (QMAs) for parore are shown in Figure 1. The fishing year for parore will be from 1 October to 30 September, and Total Allowable Commercial Catches (TACCs) and Annual Catch Entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: Quota Management Areas for parore



Key Issues to be Considered

- 2 The key issues to be considered for parore are as follows:
 - a) The biological and ecological characteristics of parore suggest it is vulnerable to the effects of fishing and habitat disturbance;
 - b) Recent commercial catches of parore have been relatively stable and are likely to be sustainable. However, there is an absence of fishery independent information to assess stock status and a risk that increased catches could threaten the sustainability of parore stocks;
 - c) While non-commercial catches of parore are currently low, it is likely that catches will increase in the future arising from the increasing human population in northern New Zealand; and
 - d) The use of set nets to catch parore could have adverse effects on the aquatic environment, particularly species diversity. The large-scale removal of parore could detrimentally affect the structure of algal communities in northern rocky reef systems.

Summary of Management Proposals

3 The proposed TACs, TACCs, and allowances for parore are presented in Table 1.

Table 1: Proposed TACs, TACCs, and allowances for parore (tonnes)

Stock	TAC	Recreational allowance	Customary allowance	Other sources of mortality	TACC
PAR 1	74	6	3	4	61
PAR 2	4	1	1	0	2
PAR 9	25	2	1	1	21
PAR 10	0	0	0	0	0

4 It is also proposed to:

- Amend the reporting regulations to ensure that the appropriate fishstock codes for parore are used under the QMS;
- Set an interim deemed value of \$0.24 per kg and an annual deemed value of \$0.48 per kg for the 2004–05 fishing year for parore; and
- Include parore within the combined 20 finfish daily bag limit for recreational fishers around the North Island.

TACs

5 MFish proposes to set TACs for parore stocks using the provisions under s 13 of the Fisheries Act 1996 (the Act).

6 As an alternative to setting a TAC under s 13, the Act allows TACs to be set under s 14, provided one of the three criteria specified in s 14(8) applies. However, MFish does not consider that any of the criteria specified are applicable to parore. Firstly, MFish considers that the maximum sustainable yield (MSY) could be estimated for parore stocks. Secondly, a catch limit for New Zealand has not been determined as part of an international agreement. And finally, there is currently insufficient rationale to support management on a rotational or enhanced basis.

7 Section 14B of the Act provides a further fishstock management option for setting a TAC. This provision enables the Minister to set a TAC that maintains a stock at a level below B_{MSY} to ensure its long-term viability to allow inter-related stocks to be taken at a TAC level based on B_{MSY} . MFish considers there is an absence of information to support such a strategy for parore.

Rationale for Proposed TACs

8 The lack of stock assessment information for parore means catch information is used to set the TACs. The proposed TACs are based on the recent reported commercial landings with a nominal allowance for the non-commercial catch, and other sources of fishing-related mortality.

9 Parore is principally caught as a bycatch in northern set net fisheries that target grey mullet, flatfish, and trevally. Annual commercial catches of parore over the past ten years have been relatively stable (refer to Table 2).

- 10 The reported landings for parore in FMA 1 and 9 have had to be revised by MFish as misreporting has occurred. Fishers have over reported landings in FMA 1 and under reported landings in FMA 9. Fishers have reported parore landed in FMA 9 under FMA 1 as the main associated target species, grey mullet and flat fish, combine these two FMAs respectively as GMU 1 and FLA 1. MFish has compared the estimated catch data for the relevant statistical areas and the reported landing data and worked out revised estimates of reported landings for FMA 1 and 9. The revised estimates of reported landings are considered to be the best information available on recent catch levels. Reported landings for FMAs 2-8 are unchanged.
- 11 The apparent stability in the estimates of reported landings suggests existing catches are at sustainable levels. Consequently, the proposed TACs aim to provide for utilisation at existing levels. This approach is considered appropriate given the absence of fishery independent information to assess stock status and the risk that increased catches could pose to the sustainability of parore stocks.

Table 2: MFish estimates of reported landings (tonnes) of parore by FMA, fishing years 1990–91 to 2002–03.

Year	Estimates of Reported landings by FMA							
	1	2	3	4	5	7	8	9
1990–91	81	< 1	< 1	< 1	< 1	< 1	< 1	18
1991–92	76	< 1	< 1	0	0	< 1	0	22
1992–93	70	< 1	< 1	0	< 1	< 1	0	20
1993–94	68	< 1	0	< 1	0	< 1	< 1	24
1994–95	67	< 1	< 1	0	0	< 1	0	23
1995–96	53	< 1	0	0	0	3	< 1	23
1996–97	63	< 1	< 1	< 1	0	< 1	< 1	17
1997–98	62	< 1	< 1	0	0	< 1	< 1	20
1998–99	64	< 1	< 1	< 1	0	< 1	< 1	18
1999–00	62	< 1	< 1	0	< 1	< 1	< 1	33
2000–01	53	< 1	< 1	0	0	< 1	< 1	17
2001–02	58	1	< 1	0	< 1	< 1	0	19
2002–03	60	< 1	< 1	< 1	< 1	< 1	< 1	16

- 12 Parore is likely to have a low population size because of its limited habitat range. Parore is usually associated with coastal reefs and estuaries, in depths of less than 10 m, and is mainly found in northern New Zealand. Parore appears to be dependent on sheltered habitats with seagrass and brown seaweeds during the juvenile phase. Such environments are known to have suffered environmental degradation in the past and are still under threat. These attributes suggest that parore is susceptible to the effects of fishing and habitat disturbance (refer Annex One for more detail on the biology of parore and on the characteristics of the fishery).
- 13 MFish considers it appropriate to constrain catches to existing levels until such time as there is more information to assess stock status. As part of this approach, MFish also proposes to include parore within the combined 20 finfish daily bag limit for recreational fishers around the North Island.
- 14 Constraining catch to existing levels would also address the risk that increased set netting for parore could cause adverse effects on the aquatic environment. Set netting

can potentially impact on species diversity by indiscriminately catching a wide range of coastal species, including protected marine mammals (particularly dolphins).

- 15 Parore is one of the few species of herbivorous fish in New Zealand, and it may play an important role in algal communities in northern rocky reef systems. The proposed TACs would limit the risk of large-scale removals of parore detrimentally affecting the dynamics of algal communities.
- 16 It is expected that the effects of the parore fishery on the aquatic environment are likely to remain unchanged under the proposed TAC levels. All of the associated target species are also managed within the QMS.

PAR 1

- 17 PAR 1 is the principle parore fishery. Annual commercial catches over the past ten years have been stable ranging between 53 and 68 tonnes in PAR 1 (refer Table 2). The average annual reported catch for this ten-year period (1993–94 to 2002–03) is 61 tonnes.
- 18 MFish proposes that the TAC for PAR 1 be set at 74 tonnes. The TAC is largely based on the reported commercial catch over the past six years, and incorporates allowances for customary and recreational fishers, and other sources of fishing-related mortality.

PAR 2

- 19 The average reported annual commercial catch of parore in PAR 2 (incorporating Fisheries Management Areas (FMAs) 2, 3, 4, 5, 6, 7, and 8) has been less than 1 tonne over the last ten years. Accordingly, MFish proposes a nominal TAC of 4 tonnes that incorporates small allowances for commercial, customary and recreational fishers.

PAR 9

- 20 The annual commercial catches for PAR 9 have been relatively stable over the past ten years ranging from 16 to 33 tonnes, and averaging 21 tonnes. MFish proposes that the TAC for PAR 9 be set at 25 tonnes. The TAC is based on the average annual reported commercial catch over the past six years, and incorporates allowances for customary and recreational fishers, and other sources of fishing-related mortality.

PAR 10

- 21 MFish proposes to set the TAC at zero tonnes for PAR 10. This is because no catches have been reported from the Kermadec FMA. In addition, the 12 nautical mile marine reserve around the Kermadec Islands prevents fishing in the inshore area where parore is likely to be found.

Allocation of TAC

Recreational allowance

- 22 There are no quantitative estimates of recreational catch for parore from the National Marine Recreational Fishing surveys. However, it is likely that parore is caught by recreational fishers in northern areas as bycatch when set netting for other species such as snapper, trevally, and mullet, as well as being targeted opportunistically by spearfishing. It is likely that recreational catches of parore will increase over time as a result of an increasing human population in northern New Zealand, and an increase in the number of recreational fishers. In the absence of any quantitative estimates of recreational harvest of parore, MFish considers it appropriate to base a recreational allowance on 10% of the proposed TACC for this stock. Accordingly, MFish proposes a recreational allowance of 6 tonnes for PAR 1 and 2 tonnes for PAR 9.
- 23 The recreational catch of parore is likely to be small in PAR 2. Accordingly, MFish proposes a nominal recreational allowance of 1 tonne for PAR 2, to reflect a general lack of abundance of this species within these areas. No recreational allowance is proposed for PAR 10 given the isolated nature of the QMA and the presence of a marine reserve around the Kermadec Islands.
- 24 When considering the allowance for recreational interests in each of the parore fishstocks, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made under s 311 of the Act. However, no such regulations have been made.

Customary Allowance

- 25 Parore is not considered to be of particular importance to Māori, and there is no known level of customary catch. However, small catches of parore are likely to be taken by customary fishers as a bycatch when targeting other species. The customary catch of parore is assumed to be less than the recreational. MFish considers it appropriate to set an allowance for PAR 1 for customary interests based on 50% of the proposed recreational allowance. Accordingly, it is proposed to set an allowance of 3 tonnes for PAR 1 and 1 tonne for PAR 2. A nominal 1 tonne allowance is proposed for PAR 2. No customary allowance is proposed for PAR 10.
- 26 In considering the proposed allowances for customary non-commercial interests, the Minister is required to take into account any mātaihai reserve or s 186A closure in the relevant QMA. MFish does not consider that the allowances proposed for customary catches will detract from the intent of any mātaihai or s 186A closure presently in place, nor will the allowance be likely to be insufficient in terms of the customary use of parore in these areas.

Allowance for other sources of mortality

- 27 The level of illegal take of parore is likely to be low given it is a relatively low value species. It is likely that an amount of parore will escape the set net and be subject to delayed fishing-related mortality.

- 28 Accordingly, MFish proposes to allow for other sources of fishing-related mortality as an allowance of 5% of the TAC for PAR 1, and PAR 9. This corresponds to proposed allowances of 4 tonnes for PAR 1, and 1 tonne for PAR 9. No allowance for other sources of fishing-related mortality is proposed for PAR 2 and PAR 10. No catches of parore have been reported in PAR 10, and the small size of catches in PAR 2 means that an allowance would be minimal and is not seen as necessary at this stage. If new information is received in the future an allowance could be made at that stage.

TACC

- 29 MFish proposes that TACCs be set at the average annual commercial catch levels over the past ten years (1993–94 to 2002–03). This approach is proposed given the relative stability of catch over this period and the likelihood that this level of catch will not pose a sustainability risk.
- 30 MFish proposes to set a TACC at 61 tonnes for PAR 1 based on the average annual reported landings over the past ten years. Using the ten year average provides for current catch levels and addresses the sustainability risk that may be posed by higher catch levels.
- 31 A TACC of 21 tonnes is proposed for PAR 9 based on the same ten-year period, again to reflect a period of relative stability in catches.
- 32 A nominal TACC of 2 tonnes is proposed for PAR 2 to reflect the small catches in this QMA, and the likelihood that some of these reported landings have been a miscoding of other species (eg, parore (PAR) instead of porae (POR)).
- 33 A TACC of 0 tonnes is proposed for PAR 10 to reflect the absence of any reported landings within the Kermadec FMA, and the presence of a marine reserve over the likely parore habitat.

Other Management Measures

Amateur daily bag limit

- 34 There is no daily limit on the quantities of parore that can be currently taken by recreational fishers. Due to concerns about the species' vulnerability to the effects of fishing, and the likelihood that future recreational catches will increase, MFish considers a daily bag limit for parore is necessary to restrict recreational catches. Accordingly, MFish proposes to include parore as part of the combined 20 finfish daily bag limit. Most of the other common inshore species associated with parore catches (eg, flatfish, mullet and trevally) already have daily bag limits. The proposed daily bag limit will assist to ensure that parore catches will remain sustainable.
- 35 The proposed daily bag limit would apply to waters around the North Island as recreational fishers will rarely catch parore in South Island waters.
- 36 The proposed daily bag limit will be implemented by amending the relevant amateur fishing regulations that apply to the North Island.

Consequential amendment to regulations

- 37 As a consequence of introducing parore into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this document.

Deemed value and over-fishing threshold

- 38 MFish considers that parore falls within the 'low knowledge' fishstock category. MFish proposes to set the annual deemed value is set at 60% of the average port price, and the interim deemed value at 50% of the annual deemed value.
- 39 MFish proposes to set an interim deemed value at \$0.24 per kg and a final deemed value of \$0.48 per kg for parore for the 2004-05 fishing year. The proposed deemed value is set using a port price of per \$0.80 per kg (based on the December 2003 port price survey).
- 40 Consistent with the policy framework for deemed values and overfishing thresholds as it applies to low knowledge fishstocks, MFish does not propose to set differential deemed values or overfishing thresholds for parore.

Statutory Considerations

- 41 In proposing the management options the following statutory considerations have been taken into account:
- a) The purpose of the Act (as provided in s 8) is to provide for the utilisation of fisheries resources while ensuring sustainability. The management proposals seek to ensure sustainability of the fishstocks by setting TACs and other appropriate measures. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers.
 - b) The TAC under s 13 of the Act should be set at, or move the stock towards, a level that can produce the MSY. There is no stock assessment information for parore. The proposed TACs are based on estimates of annual reported commercial landings, which have ranged for all FMAs between 70 and 95 tonnes over the past ten years. The relative stability of recent catch levels means that utilisation at current levels can be provided for without posing a risk to the sustainability of parore stocks.
 - c) No specific environmental conditions have been identified that affect the abundance or recruitment of parore (required to be considered under s 13(2)(b)(ii)).
 - d) Several inshore species (grey mullet, flat fish, and trevally) are taken with parore due to the use of set nets for commercial harvesting. The effects of fishing on the above interdependent stocks are principally managed by the QMS using various TACs and regulatory mechanisms. There is no evidence that the interdependence of stocks is of significant magnitude to impact on the setting of the TAC (required to be considered under s 13(2)).

- e) Section 9(a) requires the maintenance of associated or dependent species above a level that ensures its long-term viability should be considered. The likelihood that parore plays a role in the structure of algal communities in northern rocky reef systems has been considered when setting TACCs in relation to current catch levels.
- f) Section 9(b) requires that the maintenance of biological diversity be taken into account. Parore is principally caught as a bycatch in set net fisheries. The method of set netting can have adverse effects on the aquatic environment. Closed areas and method restrictions provide some protection for the aquatic environment. However, set netting can still potentially impact on species diversity by indiscriminately catching a wide range of coastal species, including protected marine mammals (particularly dolphins). This is one of the factors that have been considered when setting TACCs in relation to current catch levels.
- g) Section 9(c) requires consideration of the protection of habitat of particular significance to fisheries management. No known habitats of particular significance to fisheries management would be impacted on by harvesting parore using set nets. MFish is not aware of any significant environmental issues linked to the set net fishery taking parore as a bycatch. The effects of the parore fishery on the aquatic environment are likely to remain unchanged under existing catch levels. Given the bycatch nature of the parore fishery, it is not anticipated that setting TACs for parore will result in new areas being fished.
- h) There is likely to be social and economic effects associated with the proposed TACs, although the precise nature of these effects cannot be readily quantified. The most obvious effect will be on the associated set net fisheries and the need to balance catches with ACE or to pay deemed values. The availability of ACE is determined by the extent of the proposed TACCs. If the catch of parore exceeds the TACCs there will be economic effects on the associated target fisheries through having to pay deemed values. Alternatively, the lack of ACE for parore may limit the utilisation of the target species. These economic effects need to be considered along with the sustainability risk that a higher TACC may pose.
- i) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks, and maintenance of biodiversity). However, no obligations apply directly to parore. MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for parore in this document.
- j) Section 11(1)(b) provides that the Minister may take into account existing controls under the Act when setting or varying a sustainability measure such as a TAC. No minimum size limit applies to the amateur or commercial fisheries, and there is no amateur daily bag limit. The proposal to include parore as part of the 20 fish maximum daily bag limit for the North Island is outlined under the Other Management Measures subheading.

- k) No fisheries plans exist or are proposed that would otherwise have to be taken into account when setting the TACs for the parore fishstocks. No decisions have been made to require services, or not to require services in this fishery
- l) MFish is not aware of any considerations in any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to setting TACs for parore at this time.
- m) As required under s 11(2)(c), the Minister has considered and determined that the management proposals do not conflict with the requirements of the Hauraki Gulf Marine Park Act 2000. The proposed TACs will allow for the sustainable utilisation of the species by all those with fishing interests. The possible bycatch of parore in target fisheries within the park boundaries is likely to be better reported and managed under the requirements of the QMS.
- n) The nature of the fishery and interests of the respective fishing sectors have been considered in setting the TAC, TACC, and allowances for customary and recreational interests and all other mortality to the stock caused by fishing.

Preliminary Recommendations

42 MFish recommends that the Minister:

- a) **Agrees** to set a TAC of 73 tonnes for PAR 1 and within the TAC set the following:
 - i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 6 tonnes;
 - iii) An allowance for other fishing-related mortality of 3 tonnes; and
 - iv) A TACC of 61 tonnes.
- b) **Agrees** to set a TAC of 5 tonnes for PAR 2 and within the TAC set the following:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance for other fishing-related mortality of 1 tonne; and
 - iv) A TACC of 2 tonnes.
- c) **Agrees** to set a TAC of 25 tonnes for PAR 9 and within the TAC set the following:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 2 tonnes;
 - iii) An allowance for other fishing-related mortality of 1 tonne; and
 - iv) A TACC of 21 tonnes.
- d) **Agrees** to set a TAC of 0 tonnes for POR 10.

- e) **Agrees** to include parore as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986.
- f) **Agrees** to include parore as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.
- g) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.
- h) **Agrees** to set an interim deemed value of \$0.24 per kg and an annual deemed value of \$0.48 per kg for the 2004-05 fishing year.

ANNEX ONE

Species Information

Species Biology

- 43 Parore (*Girella tricuspidata*) ranges from North Cape down to Cook Strait. Parore has not been recorded around the Chatham Islands.
- 44 Parore usually occur in schools, ranging from half a dozen to several hundred individuals. There is evidence that some individual large parore may display territorial behaviour on some reef systems. However, work on parore in Australia has shown that parore is capable of moving distances of hundreds of kilometres.
- 45 The average size of parore is about 30–40 cm in length, reaching a maximum of at least 60 cm in length. The maximum age for this species on the North Island east coast is ten years. No growth studies have been undertaken on the west coast of the North Island. Growth is relatively rapid in the first year of life, with fish having a size of 10 cm at age one. Parore reach a length of 30 cm by age five, when growth slows.
- 46 Maturation and functioning of gonads occurs at about 28 cm in length. The sex ratio in parore is effectively 1:1. Spawning takes place in late spring/early summer. Juvenile parore recruitment is largely confined to estuarine environments. Parore appear to be dependent on sheltered habitats with seagrass and brown seaweeds for recruitment and growth of juveniles. Known areas of high initial juvenile settlement abundances are around Neptune's Necklace beds on shallow reefs and in seagrass meadows. At an age of one year, parore move out to coastal reefs near estuary mouths. Over the next two to three years they move to reef systems further away.
- 47 Parore are important herbivores in coastal systems, and may play a significant role in structuring algal assemblages. As juveniles parore may provide a food source for other fish species, and have been found as juveniles in the stomachs of kahawai and John dory. Parore is unlikely to be sufficiently abundant to have an impact on food sources.
- 48 There is no fishery independent information to determine the stock status of parore. Biomass estimates cannot be determined for this species with existing data.

Fishery Characteristics

Commercial catch

- 49 Parore is mainly caught in FMA 1 in eastern Northland and the Firth of Thames, and in FMA 9 in the Kaipara and Manukau Harbours. Little parore is caught in the other FMAs. There is a possibility that there may be some misreporting of parore catches as a result of confusion by fishers between the codes PAR (parore) and POR (porae) when providing fishing information. These two species occur in shallow northern waters, and their overlap in the records from inshore fisheries may not always be easy to discern.

- 50 Parore is principally caught as a bycatch in the grey mullet, flatfish and trevally set net fisheries in northern New Zealand (Table 2). Highest catches of parore occur during September to October.

Table 2: Estimated catch (tonnes) of parore by target species, fishing years 1989–90 to 2001–2002.

Fishing Year	Grey mullet	Trevally	Flatfish	Snapper	Parore	Kahawai	Rig	Other
1989–90	10	2	2	2	2	1	1	0
1990–91	32	17	9	9	9	2	2	6
1991–92	35	15	11	18	7	1	3	9
1992–93	32	21	12	20	5	3	2	7
1993–94	23	37	9	11	8	2	1	7
1994–95	27	32	11	9	5	5	2	1
1995–96	31	24	11	12	1	9	3	4
1996–97	33	18	7	8	1	1	2	3
1997–98	34	18	8	4	0	1	2	6
1998–99	36	17	7	3	1	3	3	2
1999–00	40	8	12	3	1	3	1	6
2000–01	41	12	22	5	2	4	1	3
2001–02	36	8	15	1	1	1	2	1

Customary and recreational catch

- 51 There is no quantitative information on customary harvest levels of parore. Customary fishers are likely to catch small quantities of parore when targeting other species such as snapper, trevally, and mullet. Parore is considered to be a low value customary species and current catches are likely to be low.
- 52 The National Marine Recreational Fishing surveys in 1994, 1996, and 2000 do not provide estimates of recreational catches of parore. There is likely to be some recreational catches in northern areas as a bycatch of other species such as snapper, trevally, and mullet. These catches are most likely taken by the method of set netting, as well as being targeted opportunistically by spearfishing. Parore is considered to be a low value recreational species and current catches are likely to be low.
- 53 Non-commercial catches are likely to increase in the future arising from the increasing human population in northern New Zealand, and the likely increase in the number of recreational fishers. An increasing population will lead to more non-commercial set netting activity for species such as snapper and trevally, which will invariably lead to an associated increase in the bycatch of parore. A change in non-commercial preference may increase the amount of parore taken as a target species, especially as parore is considered to make good eating.

Regulatory Framework

- 54 There are no existing regulations that specify catch limits or other sustainability measures for parore. There is no minimum size limit for amateur or commercial fishers for this species. There is no species-specific bag limit restriction on parore for amateur fishers.
- 55 A recreational fisher can only use one 60 m long set net to catch parore, which must not be set within 60 m of another net, and must not extend more than one-quarter of

the width of any river, stream, channel, bay or sound. Specific minimum mesh sizes apply to the various associated target species. There are also a number of local set netting prohibitions to protect marine mammals, seabirds, salmon and trout.

Fishery Assessment

- 56 There has been no scientific assessment of the maximum sustainable yield for parore stocks. The reference or current biomass of any of the parore stocks is unknown.

Environmental Issues

- 57 Environmental issues in relation to the parore fishery were discussed in the main section under the Rationale for Proposed TACs subheading.

Current and Potential Research

- 58 There has been no directed fisheries research specifically on parore, and no directed research is planned for the next two to three years.

Social, economic, or cultural factors

- 59 MFish is not aware of any information on particular social, economic, or cultural matters that could influence the setting of TACs and TACCs for parore beyond those considered in the main section.

PARORE (PAR) – FINAL ADVICE

Initial Proposal

- 1 MFish proposed to set and allocate the TAC for each parore (*Girella tricuspidata*) stock as outlined in Table 1.

Table 1: Proposed TACs (in tonnes), TACCs and other allowances for parore stocks

Stock	TAC	Recreational allowance	Customary allowance	Other sources of mortality	TACC
PAR 1	74	6	3	4	61
PAR 2	4	1	1	0	2
PAR 9	25	2	1	1	21
PAR 10	0	0	0	0	0

- 2 MFish also proposed to amend Part 1 of Schedule 3 of the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for parore, to set an interim deemed value of \$0.24 per kg and an annual deemed value of \$0.48 per kg, and to include parore as part of the 20 finfish combined species recreational bag limit in Fisheries Management Areas (FMAs) 1, 2, 8 and 9.

Biological and Fishery Information

Submissions

- 3 No submissions were received on biological and fishery information for parore.

TACs, Allowances and TACC setting considerations

Submissions

- 4 The **Northern Inshore Fishing Company Ltd** supports setting the TACs for parore under s 13 of the Fisheries Act. The company agrees with the use of commercial catches from 1993–04 to 2002–03 as the method of setting the TACC for PAR 1.
- 5 **Te Ohu Kai Moana** (TOKM) notes the absence of stock assessment information requires TACs to be based on commercial catch landings. TOKM considers parore could be subject to over fishing by the recreational sector but probably not the commercial sector as the number of commercial set netters is steadily decreasing. TOKM accepts the proposed TACs, allowances and TACCs at this time, but is concerned the proposed recreational allowances do not reflect the true rate of parore catches or the likely expansion of those catches in northern New Zealand. TOKM strongly urges intensive education and compliance efforts to ensure recreational take does not exceed the proposed allowances.

MFish Discussion

- 6 MFish notes the submissions received on the IPP support the setting of sustainability measures under s 13 of the Fisheries Act 1996 (the Act). The submissions also support the proposed TAC, TACC, and allowances for each fishstock, and the methodology for calculating the TACs. The proposed TACs provide a balance to ensure the fishstocks remain sustainable, while allowing fishers to continue to utilise parore at current catch levels
- 7 MFish notes TOKM's concerns over the proposed recreational allowances for North Island stocks and the likely expansion of recreational catches in northern areas. MFish considers the proposed allowances for recreational interests are appropriate given the absence of any quantitative information on recreational harvest levels. No additional information was forthcoming from the recreational sector on recreational harvest estimates for parore. MFish accepts that while recreational catches of parore are probably small, catches are likely to increase as the number of recreational fishers in the North Island increases. The IPP identifies the potential problem of an increasing recreational harvest and proposes to include parore as part of the combined 20 finfish daily bag limit to constrain the harvest of this species by recreational fishers.

Social, Cultural and Economic Factors

Submissions

- 8 **Mr Bruce Coleman** fishes commercially for flounder in QMA 9. He requests a change to the statutory catch history years so that those who have caught parore recently are entitled to receive quota for parore. Mr Coleman entered the flounder fishery at the beginning of the 2003 fishing year. He caught 2 tonnes of parore as a bycatch but he claims he does not have the resources, like many other flounder fishers, to buy parore quota.

MFish Discussion

- 9 MFish does not support changing the statutory catch history years for PAR 9. The Act prescribes the statutory catch history years as 1990–92. MFish is unaware of any special circumstances related to the PAR 9 fishery that justifies changing the statutory catch history years for this fishery. MFish notes that the Fisheries Bill 1996 expressly removed any provision for considering 'commitment and dependence' when determining quota allocations. There is no requirement in the Act to consider individual circumstances when allocating quota.

Environmental Considerations

Submissions

- 10 No submissions were received on environmental considerations for parore.

Deemed Values and Overfishing Thresholds

Submissions

- 11 The **Northern Inshore Fishing Company Ltd** accepts the inclusion of the species in the low knowledge fishstock category for deemed values.
- 12 **TOKM** supports the classification of parore as a low knowledge fishstock for deemed value purposes.
- 13 **Mr Bruce Coleman** says fish buyers are paying between \$0.40 per kg and \$0.60 per kg for parore in PAR 9. Mr Coleman says fishers will have to consider the option of dumping parore to avoid paying deemed values.

MFish Discussion

- 14 The submission from Mr Coleman suggests a different port price for PAR 9 than the one included in the IPP. The 2003 port price survey results for parore are consistent with the information provided by Mr Coleman. MFish recommends changing the deemed value to be consistent with the recently received 2003 port price survey. Instead of a port price of \$0.80 per kg for all QMAs, the revised port price is \$0.51 per kg for PAR 1, PAR 2, and PAR 10, and \$0.56 per kg for PAR 9. The new annual deemed value for PAR 1, PAR 2, and PAR 10 would be \$0.31 per kg, and the annual deemed value for PAR 9 would be \$0.34 per kg. MFish considers the lower deemed value for parore would make it less likely that fishers will dump parore.
- 15 The submissions do not oppose classifying parore as a low knowledge fishstock.

Other Management Measures

Submissions

- 16 The **Northern Inshore Fishing Company Ltd** supports the inclusion of parore in the amateur daily bag limit for North Island recreational fishers.
- 17 **TOKM** supports the inclusion of parore in the combined species bag limit for amateur fishers.
- 18 **TOKM** agrees there is no need to include parore on the Sixth Schedule. It favours including parore, and all other new entrant QMS stocks, on the Fifth Schedule.

MFish Discussion

- 19 The submissions support the inclusion of parore as part of the combined 20 finfish recreational daily bag limit for the North Island. No submissions were received from the recreational sector on this matter. MFish considers it appropriate to impose a catch limit on the recreational harvest of parore, given the species' vulnerability to the effects of fishing and the likelihood that recreational catches will increase in the future. The proposed daily bag limit will assist to ensure that catches remain sustainable.

- 20 MFish does not agree with TOKMs proposal to include all new species introduced into the QMS on the Fifth Schedule of the Act. The MFish response to this proposal is discussed in the introductory section to this document.
- 21 MFish agrees with TOKM that there is no need to include parore on the Sixth Schedule of the Act and notes that it had not proposed to do so.

Conclusion

- 22 Three submissions were received on the proposed sustainability measures for parore for QMS introduction on 1 October 2004. Two of these submissions support the proposed TAC, TACC and allowances for each fishstock, deemed values, and daily bag limit restrictions that will apply to North Island recreational fishers.
- 23 The other submission received requested a change to the statutory catch history years. The statutory catch history years are set in the Act and MFish can see no reason why they should be changed for this fishery. MFish recommends an adjustment to the proposed deemed values to reflect the most recent port price information.
- 24 MFish considers the proposed TACs and supporting measures provide an appropriate balance in allowing fishers to continue to utilise parore at recent catch levels, while ensuring sustainability. The need for any additional management measures will be revisited when explicit sustainability or utilisation issues are identified.

Final Recommendations

- 25 MFish recommends that you:
- a) **Agree** to set a TAC of 74 tonnes for PAR 1, and within this set:
 - i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 6 tonnes;
 - iii) An allowance of 4 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 61 tonnes.
 - b) **Agree** to set a TAC of 4 tonnes for PAR 2, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 2 tonnes.
 - c) **Agree** to set a TAC of 25 tonnes for PAR 9, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 2 tonnes;
 - iii) An allowance of 1 tonne for other sources of fishing-related mortality; and

- iv) A TACC of 21 tonnes.
- d) **Agree** to set a TAC of 0 tonnes for PAR 10, and within this set:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 0 tonnes.
- e) **Agree** to include parore as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986.
- f) **Agree** to include parore as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.
- g) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to prescribe a code for parore to be used by commercial fishers when completing their statutory catch returns.
- h) **Agree** to set for PAR 1, PAR 2, and PAR 10 an interim deemed value of \$0.16 per kg and an annual deemed value of \$0.31 per kg for the 2004–05 fishing year.
- i) **Agree** to set for PAR 9 an interim deemed value of \$0.17 per kg and an annual deemed value of \$0.34 per kg for the 2004–05 fishing year.

PIPI - WHANGAREI HARBOUR (PPI 1A) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 The Minister of Fisheries has decided to introduce pipi (*Papies australis*) in Whangarei Harbour into the QMS, to take effect on 1 October 2004. The Quota Management Area (QMA) for pipi in the Whangarei Harbour is shown in Figure 1. The fishing year for Whangarei Harbour pipi will begin on 1 October and end on 30 September in the following year. The TACC and ACE are to be expressed in terms of greenweight.
- 2 MFish will consider introducing into the QMS pipi outside of Whangarei Harbour in 2005. This may necessitate a further review of the proposed regulatory interventions proposed for this fishery.

Figure 1 **Proposed QMA for the Whangarei Harbour pipi fishery**



Key Issues to be Considered

- 3 Key factors and issues that need to be taken into account in determining management options for this fishery may be summarised as follows:
 - a) There are pipi beds throughout Whangarei Harbour, occurring both inter-tidally and sub-tidally;

- b) The only commercial fishery for pipi in Whangarei Harbour occurs on Mair Bank. Most pipi are taken as target species with smaller amounts being recorded as bycatch from cockle gathering;
- c) Pipi play an important role in the harbour ecosystem – providing a food source for both harbour fish and seabird populations. They are also thought to play a role in maintaining water quality and sediment stability. However, there has been no sign of such problems actually occurring under current fishing methods and recent catch levels; and
- d) As well as the commercial fishery, pipi in the Whangarei Harbour are harvested by recreational fishers and represent a valued local customary resource. The main allocation issue is therefore to ensure that catch allowances enable all users to meet their reasonable needs.

Management Options

- 4 The following TAC, TACC and non-commercial allowances are proposed for PPI 1A:

Table 1: Proposed TACs, TACCs, and allowances for PPI 1A

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
PPI 1A	250	25	25	0	200

- 5 At this time MFish proposes retaining:
- a) Regulation 4D of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986 restricting commercial harvesting of pipi to a defined area within the QMA; and
 - b) Part of 22A of those regulations restricting commercial fishers to the method of hand gathering. Those measures are discussed in detail below.
- 6 It is also proposed to remove the other component of Regulation 22A that imposes a 200kg daily limit on for commercial fishers.

Proposed TACs

- 7 MFish considers that the provisions of s 13 of the Act are most appropriate for setting sustainability measures for this fishery. Section 13 requires that the stock is maintained at, or moved towards, a level that can produce the maximum sustainable yield. MFish does not consider that pipi in PPI 1A meet the criteria for consideration under the alternative options for setting sustainability measures provided by s 14.
- 8 The only assessment of biomass available for the fishery was done in 1989 and only applied to Mair Bank. With no more recent information to indicate whether the population has changed in response to past and current harvest levels, this survey cannot be relied upon as an accurate estimate of current abundance or yield for the fishery.
- 9 Consequently, the proposed TAC of 250 tonnes has been set on the basis of a combination of known and estimated levels of recreational, Māori customary, and

commercial catch and other sources of mortality, approximating an MCY (maximum constant yield) approach.

Rationale for Proposed TAC

- 10 Considerations of likely influences on biomass and the biology and the role of pipi in the Whangarei Harbour ecosystem, in combination with catch information, provide the basis for the proposed TAC.
- 11 It is not known whether or not the biomass of pipi on Mair bank and elsewhere in the harbour changes with time because of recruitment variability and migration patterns. There are thought to be sub-tidal beds, which for that reason are not easily accessible to fishers, that may contribute to the harvestable biomass. However, it is also possible that sedimentation in the harbour may adversely affect pipi populations.
- 12 There are other factors that support a precautionary approach being taken in setting the TAC. These are firstly that pipi represent an important food source for harbour fish and seabirds. They are also thought to play a significant role in maintaining harbour water quality. During preparation of an extensive study of all aspects of the Whangarei Harbour environment in the mid 1980s, people expressed concerns in submissions about possible adverse effects on the sediment dynamics of the bank and the hydrology of the harbour if excessive quantities of pipi were removed from Mair Bank. While no such impacts appear to have occurred, this possibility cannot be entirely discounted if harvest levels were set too high, or if mechanical harvesting methods were allowed.
- 13 There is no time series of information available on recreational or customary harvests, but data is available from the MFish databases on yearly commercial harvests since 1989 (refer Table 2). This information shows that catches have varied since then by about 60% — from 121 to 192 tonnes. There appears to be no clear trend in harvests, with small catches and landings in 1989–90, followed by a brief period of higher catches between 1991–93. It appears that the explanation given by commercial fishers that harvest is largely determined by market demand, accounts for this variability. Overall, catches average 182 tonnes/year since 1990–91. In terms of the criteria to be applied in determining catch levels, indications are that this has become a stable fishery in recent years.

Table 2: Total annual landings of pipi 1990 - 2003

Fishing Year	Landings (LFRR¹) (tonnes)
1990–91	121
1991–92	275
1992–93	327
1993–94	186
1994–95	244
1995–96	172
1996–97	136
1997–98	146
1998–99	119
1999–00	127
2000–01	153
2001–02	187
2002–03	192

- 14 In determining the proposed TAC, MFish has taken all of these factors into account. It has also been mindful of the estimates of Maximum Constant Yield (MCY), ranging from 517 to 1 033 tonnes that were based on the 1989 biomass survey. These estimates are considerably lower than the quantities that all sectors are thought to have harvested over recent years. However, they are not recent estimates.
- 15 Research is proposed for 2005–06 to obtain information on biomass and to be used as the basis for yield estimates for the fishery. This information will give an indication as to whether or not there have been any significant changes in the biomass of pipi on Mair bank since the 1989 survey. It will therefore provide a basis to check the initial sustainability measures set for this fishery.

Allocation of TAC

- 16 The proposed allocations to commercial, recreational and customary fishers are based entirely on the information on historical commercial catch and on anecdotal information about recreational and customary catch. The approach used to determine harvest estimates for pipi is consistent with that MFish used previously for cockles. This is because the levels of interest and therefore quantities of pipi in the harbour harvested for recreational and customary purposes are likely to be very similar to those that have been estimated to have been obtained for cockles.
- 17 There appears to be no compelling reasons why any one sector should be given preference over others. Therefore, the proposed allocations are intended to ensure that all sectors can satisfy their reasonable needs.

Recreational Allowance

- 23 A recreational allowance of 25 tonnes is proposed. This amount involves recognition of the fact that while pipi are certainly harvested by recreational fishers in the harbour, quantities taken are unknown. Twenty-five tonnes is the quantity of cockle

¹ Licensed Fish Receiver Returns - the quantities of pipi that commercial receivers have recorded as being supplied from the permit holders.

that recreational fishers are estimated to harvest in the harbour – a fishery that is very similar to PPI 1A. This amount has subsequently been used to determine the recreational allowance for that cockle fishery and is considered to provide a useful estimate of the recreational harvest of pipi.

Customary Māori Allowance

A customary allowance of 25 tonnes is proposed. Like the recreational allowance, this is a nominal figure that involves recognition that pipi are harvested by local Māori. It is the same as the quantity of cockles that customary fishers are estimated to harvest at present – a quantity subsequently used to determine the customary allowance in that fishery.

Allowance for other sources of mortality

- 18 Because pipi in this fishery must be gathered by hand, there are limited sources of mortality. There may be some discarding of pipi that are not within preferred size ranges, but these pipi should survive unharmed. This allocation will be reviewed following the proposed research in 2005 or as additional information on becomes available.

TACC

- 19 A TACC of 200 tonnes is proposed. This is based on the ten year average of previous years' commercial catches (182 tonnes), with some additional considerations.
- 20 MFish notes that the 1989 biomass survey provided the basis for yield estimates that are considerably higher than estimates of total harvest over recent years. Also, anecdotal evidence, including comment from Whangarei-based MFish staff, is that current commercial harvests do not appear to be affecting the size of the Mair Bank pipi population. The indications are therefore that a 182 tonne average is sustainable.
- 21 A further consideration is that the 2002–2003 catch of 192 tonnes demonstrates that there is market demand that is greater the 182 tonne average. Setting the proposed TACC at 200 tonnes therefore provides some development opportunity in the fishery, within what MFish considers to be sustainable limits.
- 22 The research proposed for 2005–06 will provide a basis to re-assess this allowance, although this cannot be done until the research findings become available, most likely in 2007.

Other Management Measures

- 23 At this time, MFish proposes retaining Regulation 4D of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1996 that restricts commercial harvesting of pipi in the Whangarei Harbour to Mair Bank and Snake Bank, although no pipi are harvested at the latter.
- 24 Commercial harvesting within this area has historically taken place only on Mair Bank, and that catch has supported the commercial fishery since its beginning.
- 25 MFish also proposes to remove the portion of Regulation 22A that imposes a 200kg daily limit on the quantity of pipi that commercial fishers may take. Applying a

TACC removes the need to limit harvesting on a daily basis. The proposed removal of the regulation should enable commercial harvesters to achieve greater efficiency.

Method Restriction

- 26 MFish proposes to retain the part of 22A of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations that restricts commercial gathering of pipi to the method of hand gathering.
- 27 While MFish acknowledges that this proposal differs from the approach proposed for sea cucumbers and horse mussels, it considers that the characteristics of the commercial pipi fishery justify the difference. Because it is exclusively a target fishery, the utilisation issues associated with bycatch of sea cucumbers and horse mussels do not arise. This restriction will be reviewed in 2005 when consideration is given to introducing pipi in the rest of the EEZ into the QMS when issues of bycatch and associated fisheries will need to be addressed.
- 28 The pipi fishery in the Whangarei Harbour is spatially discrete. Consequently it does not warrant a prohibition on harvesting as has been applied for other species/fisheries in areas that might be vulnerable to adverse effects caused by the fishing methods used. In this pipi fishery, Mair Bank is potentially vulnerable, but a prohibition on (commercial) harvesting there to address possible adverse effects of fishing methods would see the end of the fishery.

Consequential amendment to regulation

- 29 As described above, and as a consequence of the introduction of pipi PPI 1A into the QMS, MFish proposes to amend Regulation 22A of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986 that imposes the 200kg daily limit on commercial harvesting. Details of the proposed amendments are attached as Annex One to this section.

Deemed Value and Overfishing Threshold

- 30 A separate section of this document sets out generic information on the setting of interim and annual deemed values.
- 31 As pipis are taken primarily by a method that takes little, if any, bycatch, the species is considered by MFish to fall within the high value single species fishstock category. The most recent information available (November/December 2003 MFish port price survey) indicates a port price for PPI 1A of \$1.25 per kg. A factor of 200% of port price would be applied. MFish therefore proposes an annual deemed value of \$2.50 and an interim deemed value of \$1.25.
- 32 Consistent with the policy framework for deemed values and overfishing thresholds as it applies for high value single species fishstocks, MFish proposes to set overfishing thresholds and differential deemed values for PPI 1A.

Statutory Considerations

33 In forming the management options, the following statutory considerations in the Fisheries Act 1996 have been taken into account:

a) The management options proposed for PPI 1A seek to ensure sustainability of the stock by setting a TAC and other appropriate measures. The proposal to retain the restriction on commercial harvesting to hand gathering only addresses the potential impacts of this harvesting on Mair Bank. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers at the level of current catches or best estimates. Further research on biomass and yield in 2005–06 will provide information against which to check the proposed initial measures.

b) Section 13 (2)(a) - Maintenance at MSY.

There is no information available at present to determine whether there is a need to set catch levels to either rebuild or “fish down” the stock. Consequently, the TAC was set largely on the basis of average commercial catch and estimated current non-commercial catches. MFish considers that the proposed TAC is likely to be sustainable in the medium term, and can be checked against the results of the 2005-06 survey.

c) The proposed TAC options are also based on:

i) Section 13(2)(b)(ii) - Environmental conditions affecting the stock.

Considerations here are that while no specific environmental conditions have been confirmed as affecting the stock, there is a possibility that environmental variability may affect stock abundance/recruitment.

ii) Section 13(2)(b)(ii) - Biological characteristics of the stock.

The biological characteristics of the stock mean that because pipi are predominantly sedentary, they are susceptible to over fishing and local depletion. This is another reason why, in the absence of recent information on biomass, the proposed TAC has been based upon a combination of average commercial catch and estimated non-commercial catch.

iii) Section 13(2)(a) – Interdependence of stocks.

There is no evidence that there is any interdependence of the PPI 1A stock with other species that are of significant magnitude to impact on the setting of the TAC.

d) Section 13(3) - Relevant social, cultural, and economic factors.

The proposed TAC and TACC have been calculated on the basis of past and current catches. Consequently there should be no immediate social and economic consequences. Commercial fishers say that current harvests are based on market demand, rather than availability of the stock. As noted, information from the proposed research will allow an assessment to be made about whether or not the initial sustainability measures are appropriate, and if additional utilisation potential might be realised.

- e) Section 11(1)(c) – Natural variability of stocks.
- It is not known whether pipi are prone to significant fluctuations in biomass. Anecdotal information from the commercial fishery suggests that the market demand, rather than the abundance of pipi has determined the quantities harvested over recent years.
- f) Section 9(a) and (b) – Maintenance of associated or dependent species above a level that ensures their long-term viability and maintenance of biological diversity of the aquatic environment.
- There is no bycatch of any associated or dependent species in this fishery due to the use of hand gathering for harvesting. Pipi play an important role in the Whangarei Harbour ecosystem as a food source for other species and in maintaining water quality. They may also have an influence on the sediment dynamics and stability of Mair Bank and other areas, potentially affecting the hydrology of the harbour and the habitat for pipi and other shellfish.
- These factors have been considered when determining the proposed TAC, pending receipt of more up-to-date research information from the 2005-2006 survey. The proposal to retain the current requirement that commercial harvesters use hand –gathering methods is intended to protect the shell bank environment.
- g) Section 9(c) – Protection of habitat of particular significance for fisheries management.
- While the pipi (and cockle) on harbour shell banks are important for fisheries management, no specific habitats of particular significance for this purpose have been identified within PPI 1A. MFish considers that the method of hand–gathering does not have a demonstrable adverse effect on the shell bank habitat.
- h) Section 5(a) and (b) – Interpretation of Act and exercise or performance of functions, duties, or powers conferred or imposed by or under it in a manner consistent with New Zealand's international obligations relating to fishing; and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.
- MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options for PPI 1A. In terms of Treaty obligations arising under the Settlement Act, the previous decision to include PPI 1A in the QMS provides for allocation of 20% of the commercial take to Māori. Pipi in the Whangarei Harbour are harvested for customary purposes. Consequently the customary allowance has been set at a level that is estimated to equate to current customary take.
- i) Section 11(1)(b) - Existing controls.
- In PPI 1A commercial access is currently limited to permitted fishers who are each allowed to take a maximum of 200kg of pipi per day, by hand gathering only. There is a daily bag limit for recreational fishers (150 per person per day). A list of specific controls is contained in the Annex Two. Note that the proposal to remove the daily limit on commercial harvesting is contained in the previous section on Other Management Measures.

- j) Section 11(2A)(b) – Relevant Fisheries plans.
No fisheries plan exists for PPI 1A, although commercial interests have suggested that they may prepare a plan at some time in the future.
- k) Section 11(2A)(a and c) – Conservation and fisheries services.
There are no conservation services required for this fishery. No decision has been made not to require a service in PPI 1A.
- l) Section 11(2)(a) and (b). Policy statement or plan provisions.
There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for PPI 1A.
- m) Section (2)(c) – Application of Hauraki Gulf Marine Park Act.
The Whangarei Harbour is outside the area covered by the Hauraki Gulf Marine Park Act 2000.
- n) Sections 21(1)(a and b) and (4)(i and ii) and (5) – Allowance for non-commercial fishing interests in that stock and all other mortality to that stock caused by fishing, mātaimai reserves and regulations made under s 311.
The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. No mātaimai exists in the QMA. No area has been closed or fishing method restricted for customary fishing purposes in the QMA. No restrictions under s 311 of the Act have been placed on fishing in any area within the QMA for recreational interests.
- o) Section 10 – Information principles.
The information sources relied upon to determine the proposed TAC and other management measures for this fishery consist of a NIWA report on biology, distribution and fisheries information and a survey of recreational pipi harvest in Whangarei Harbour. The NIWA report² summarises the best available information on pipi biology and distribution, including the 1989 survey of pipi biomass on the commercially harvested Mair Bank.
The fact that the biomass information is derived from a “one-off” survey that is now dated, and biological information that indicates a degree of uncertainty about annual fluctuations in biomass has caused MFish to take a relatively cautious approach to set the proposed TAC for PPI 1A. Information obtained in research in 2005–06 will provide a basis to re-assess sustainability measures for this fishery.

Conclusion

- 34 There are no indications of significant sustainability issues in the PPI 1A fishery at present. Nonetheless, in view of the important role that pipi play in the harbour ecosystem, uncertainties about whether there are significant biomass changes over

² NIWA, 2003, Potential Area Boundaries (Fishstocks) for Pipi (Mair Bank)

time, and the lack of recent biomass information for Mair Bank and elsewhere, a relatively conservative approach has been adopted in setting the proposed TAC of 250 tonnes. The proposed 2005–06 biomass survey and yield estimate will provide a basis to re-assess the initial sustainability measures.

Preliminary Recommendations

35 MFish recommends that the Minister:

- a) **Agrees** to set a TAC of 250 tonnes for PPI 1A and within that TAC set:
 - i) A customary allowance of 25 tonnes;
 - ii) A recreational allowance of 25 tonnes;
 - iii) Make an allowance of 0 tonnes for other fishing-related mortality; and
 - iv) A TACC of 200 tonnes.
- b) **Agrees** to remove reference to a 200kg daily limit for commercial harvests of pipi in PPI 1A from Regulation 22A of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1996.
- c) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.
- d) **Notes** that until further review, commercial pipi harvest is restricted to hand gathering and specific areas within Whangarei Harbour.

ANNEX ONE

Amendment to regulations

Removal of 200kg daily limit on commercial pipi harvesting in PPI 1A

Background

- 36 At present Regulation 22A of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986, restricts the maximum weight (greenweight) of pipi that may be taken or possessed by a commercial fisher on any day within the waters of quota management area 1 or quota management area 9, to 200kg. While the commercial pipi fishery in the Whangarei Harbour was outside the QMS, this limit represented the only control on quantities allowed to be harvested.

Problem definition

- 37 With introduction of pipi in Whangarei Harbour into the QMS, and in turn the application of annual catch limits in the form of a TAC and TACC, the need for daily limits no longer exists in this particular area.

Preliminary consultation

- 38 Commercial harvesters have been contacted and are supportive of the removal of the daily limit restriction.

Options

Non-Regulatory Measures

- 39 Not relevant.

Regulatory Measures

- 40 The 200kg daily limit is imposed by regulation. Therefore the only option available to make this change involves an amendment to the relevant regulation.

Costs and benefits of the proposal

- 41 There are no obvious costs associated with this proposal. The main benefit is that it will allow harvesters to arrange their fishing activities so that pipi are harvested optimally to meet market demand.

Administrative implications

- 42 The administrative implications of this proposal are that fishers will still be required to record daily harvests subject to the requirements of the Fisheries (Reporting) Regulations 2001.

Conclusion

- 43 This proposed amendment is consistent with the approach MFish adopted for the cockle fishery in Whangarei Harbour and elsewhere, when it was introduced to the QMS. It involves recognition that the introduction of new sustainability measures in the form of a TAC and TACC, which apply on an annual basis, removes the need to have additional daily limits. This improves the commercial performance of the fishery by allowing fishers to harvest when market demand is strongest.

Consequential amendments to the Fisheries (Reporting) Regulations 2001

Background

- 44 It is proposed to make consequential amendments to the Fisheries (Reporting) Regulations 2001 by:
- a) Amending Table 1 of Part 1 of Schedule 3 of those regulations, which specifies the codes to be used when completing catch returns which must be furnished to the Chief Executive. This amendment will incorporate a code which reflects the new PPI 1A QMA, and provide a reporting code for pipi that may be taken by commercial fishers elsewhere in Area 1 in the other places where commercial harvesting is presently allowed (as defined by Regulation 4D of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986. It is proposed to use the reporting code PPI 1B for pipi taken outside the Whangarei Harbour QMA but within Area 1. The amendment will also include reporting codes for pipi that may be taken by commercial fishers elsewhere in New Zealand;
 - b) Inserting a Pipi specific Table 14 into Part 1 of Schedule 3 that defines the proposed areas for PPI 1A and 1B;
 - c) Including standard areas in Table 1 of Part 1 of Schedule 3 of the regulations for any pipi harvested in FMAs outside FMA 1.
- 45 The Fisheries (Reporting) Regulations 2001 provide the framework for the completion and furnishing of statutory catch returns by fishers to the Chief Executive. Information contained in these returns is used for research, stock assessment, enforcement and administrative reasons (including balancing catch against ACE). With the new PPI 1A QMA established by the Minister, it is appropriate to amend these regulations to ensure that they reflect the Minister's decision.

Problem definition

- 46 The obligations for fishers to report their catch and the codes used to complete these returns should reflect the Minister's decisions on QMAs for each species to be introduced into the QMS on 1 October 2004.

Preliminary consultation

- 47 No direct consultation on the need to amend these regulations has been undertaken as it is a consequential amendment flowing from the Minister's QMA decisions.

Options

- 48 As the reporting framework is contained in regulations, there is no other option than to amend these regulations.

Costs and benefits of the proposal

- 49 The proposed amendments clarify the obligations for fishers when completing their statutory returns. Regulatory clarification means fishers are aware of their reporting obligations and complete their returns in the simplest fashion possible.

Administrative implications

- 50 There are no administrative implications associated with this proposal.

ANNEX TWO

Species Information

Species Biology

- 51 Pipi are found throughout New Zealand, including the Chatham and Auckland Islands. They are only found in harbours and very sheltered beaches, occurring both inter-tidally and sub-tidally. Quite extensive beds of large pipi may occur in sub-tidal, high current harbour channels, down to water depths of at least seven metres.
- 52 A study³ of patterns of distribution within a harbour environment found that there was a distinct segregation of pipi sizes and ages within different types of habitat. Juvenile pipi were found towards the higher reaches of intertidal shores, while fully mature adult pipi (over 40 mm shell length) occurred at high densities within distinctly subtidal beds in the main harbour channels. Intermediate sizes occurred between these habitats.
- 53 In this study, pipi of all sizes were found to drift. They did this by forming mucus bubble strings, and by attaching to passing objects. These findings apply to a subtidal, high current environment, and may not be representative of all habitats of pipi populations, especially those on low energy, sheltered intertidal beaches.
- 54 It is not known whether the biomass of pipi changes with time because of recruitment variability or migration patterns. In the case of the Whangarei Harbour, NIWA refer to a 1989 study⁴ of biomass on pipi on Mair Bank and speculate that there is likely to be a large sub tidal pipi resource in the immediate vicinity of the bank, which is not currently accessible to the fishery.
- 55 Pipi are sexually mature by a size of 40 mm. Pipi reproduce in a spawning process that begins in early spring, and continues through spring and summer. Spawning does not appear to be a discrete event happening at one time across a population. Instead there seems to be a series of partial spawnings over weeks or months.
- 56 Pipi growth dynamics are not well known. A tagging study⁵ of juvenile pipi indicated that they may have a seasonal growth pattern, with increased growth in the spring and summer, and little growth in autumn and winter. Pipi above 50 mm grew very slowly.

³ Hooker, S.H. (1995). Life history and demography of the pipi *Paphies australis* in northeastern New Zealand. Unpublished PhD thesis, University of Auckland. 231 p.

⁴ Haddon, M. (1989). Biomass estimate of the pipi *Paphies australis* on Mair Bank, Whangarei Harbour. Unpublished draft report, MAF Fisheries North. 24 p.

⁵ Hooker, S.H. (1995).

Fisheries Information

- 57 Virtually all (99%), of the commercial pipi catch in New Zealand comes from Mair Bank. There are currently nine people issued with permits to gather pipi. There is a daily catch limit of 200 kg per permit. All harvesting is done by hand.
- 58 Only a short commercial catch history of pipi is available. Data from MFish databases shows small landings in 1989–90, with annual averages since then of 182 tonnes. Yearly landings have been relatively constant since 1990–91, apart from higher amounts from 1991–93 (refer Table 1).

Table 1: Landings, (tonnes) of pipi as reported by LFRRs, fishing years 1989–90 to 2002–2003

Fishing Year	Landings (LFRR⁶) (tonnes)
1989–90	17
1990–91	121
1991–92	275
1992–93	327
1993–94	186
1994–95	244
1995–96	172
1996–97	136
1997–98	146
1998–99	119
1999–00	127
2000–01	153
2001–02	187
2002–03	192

- 59 There is no apparent seasonality to the commercial fishery, with pipi being harvested throughout the year.
- 60 Non-commercial fishers harvest pipi on Mair Bank and elsewhere in the harbour. The recreational daily limit is 150 pipi per person per day. There is no information available on the quantities of pipi harvested there by non-commercial fishers. There has been a recent survey of pipi harvest in the harbour, but the methods used mean that the findings are not scientifically valid and cannot be used to determine harvest estimates.

Recreational catch

- 61 Recreational catch is estimated to be the same quantity of 25 tonnes that has been applied in the Whangarei harbour cockle fishery. This estimate is based on anecdotal information about possible quantities that are being taken by recreational harvesters.

⁶ Licensed Fish Receiver Returns - the quantities of pipi that commercial receivers have recorded as being supplied from the permit holders.

Customary catch

- 62 Customary catch has been estimated using the same approach as that for the recreational catch.

Regulatory Framework

- 63 Regulation 4D of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1996 will be retained. This regulation prohibits commercial fishers taking pipi from any area except those defined there. Areas include the region Home Point to Mangawai Heads. Whangarei Harbour falls within this region. The part of Regulation 22A of these regulations that restricts commercial fishing to hand gathering only to harvest pipi will be retained, but the maximum daily weight limit of 200 kg will be revoked for PPI 1A.

Fisheries Assessment

- 64 There is no time series of biomass surveys for pipi either in Whangarei Harbour, or Mair Bank that would indicate whether the population is changing in response to past and current levels of harvesting. Nor is there any measure of catch per unit effort that would give a measure of changes in abundance. However, commercial catches from Mair Bank have remained reasonably constant over recent years, which is taken to be indicative of a stable population and a sustainable fishery. MFish has had no indication from any stakeholders that there are significant sustainability issues in this fishery. Whangarei-based MFish staff are not aware of any such issues.
- 65 The only estimate of harvestable biomass of pipi was obtained from a survey of Mair Bank in 1989. Harvestable biomass was conservatively calculated at 2 245 tonnes (of pipi greater than 49 mm shell length), using maximum ages of ten to 20 years. Estimates of Maximum Constant Yield (MCY) ranged from 517 to 1 033 tonnes.
- 66 It is not known whether the biomass of pipi on Mair Bank, changes with time because of recruitment variability or migration patterns. There is likely to be a large sub-tidal pipi resource in the immediate vicinity of the bank, which is not currently accessible to the fishery. Pipi spawned from this sub-tidal area are likely to contribute to the harvestable biomass on the bank. There are no biomass estimates available for pipi elsewhere in the harbour.

Associated Fisheries

- 67 Pipi play an important role in the harbour ecosystem – providing a food source for both harbour fish and seabird populations. Because pipi are harvested by hand, there is no by-catch of other species, although some cockles are harvested in conjunction with pipi.

Environmental Issues.

- 68 There is a description of the main environmental issue in this fishery in paragraph 33f of the main paper.
- 69 In addition, pipi (and cockle) on harbour shell banks are important for fisheries management (because they are a source of food for trevally and other locally

important fish species). However, no specific habitats of particular significance that could be affected by this pipi fishery have been identified within PPI 1A.

- 70 There are no known interactions between this fishery and any protected species. There is no information to indicate that the beds where pipi are harvested are important breeding sites for harbour bird species. However, pipi are a food source for common species - Pied and Variable Oystercatchers and Red Knot in particular. No specific controls are applied because of this relationship – rather it represents another reason to ensure that harvesting is constrained to sustainable levels that ensure that sufficient quantities remain available for the birds that feed on them.

Research

- 71 On Mair Bank, a series of surveys were carried out in 1974, 1977, 1982, 1983, 1986, and 1989 to determine pipi densities and average size; the most recent survey of Mair Bank pipi in 1989⁷ also included an estimate of harvestable biomass. There is no current research, but research is planned for 2005–06 that will provide biomass and yield estimates for Mair Bank. However, information that can be used to make such estimates is unlikely to be available until 2007.

Social, Cultural, and Economic Factors

- 72 These factors have been discussed in paragraph 33d of the main paper.

⁷ Haddon, M. (1989)

PIPI – WHANGAREI HARBOUR (PPI 1A) – FINAL ADVICE

Initial Proposal

- 1 MFish proposed to set and allocate the TAC for pipi (*Papies australis*) in Whangarei Harbour (PPI 1A) as outlined in Table 1.

Table 1: Proposed TACs (in tonnes), TACCs and other allowances for PPI 1A:

Stock	TAC	Recreation al allowance	Customary allowance	Other sources of mortality	TACC
PPI 1A	250	25	25	0	200

- 2 MFish also proposed to amend Part 1 of Schedule 3 to include a fishstock code for Whangarei pipi to be used by commercial fishers when completing their statutory catch returns, and to set an interim deemed value of \$1.25 per kg and an annual deemed value of \$2.50 per kg for the 2004–05 fishing year.
- 3 Fisheries regulations currently restrict commercial access to a defined area in Whangarei Harbour (principally Mair Bank), and to the method to handgathering only. There are no proposals to amend these restrictions at this time.

Biological and Fishery Information

Submissions

- 4 **Hollings Resource Management (HRM)**, representing the “majority of Whangarei Harbour pipi commercial fishers”, provided a late submission on the IPP. HRM considers MFish should use the Maximum Constant Yield (MCY) estimate of 517-1 033 tonnes calculated for the Mair Bank fishery in 1989 as the basis of managing the PPI 1A fishery. It notes the MCY estimate is still valid regardless of the development of a commercial fishery within Whangarei Harbour, and there is anecdotal information from fishers to suggest the Mair Bank pipi resource is still abundant and thriving.
- 5 HRM disagrees with the IPP that new biomass and yield estimates for Mair Bank will not be available until 2007. HRM considers these estimates should be available in 2005 and can be used to review the TAC for the 2005–06 fishing year.

MFish Discussion

- 6 MFish considered the 1989 survey of the Mair Bank pipi beds in developing management options for the PPI 1A fishery. This survey provides the only stock assessment information for the fishery, including an estimate of harvestable biomass of 2 245 tonnes and an MCY estimate of 517-1 033 tonnes. Both estimates are considered conservative because they are based on pipi greater than 49 mm in length. However, the 1989 survey provides information on a pipi resource at Mair Bank

15 years ago and there are no recent surveys on Mair Bank to update the 1989 biomass and MCY estimates.

- 7 Pipi stocks, like other sedentary shellfish species, demonstrate spatial and temporal fluctuations in stock size and structure due to the large influence of environmental factors on stock dynamics. These factors include water temperature, exposure rates, water currents, sand movement, food availability and predation. For example, the location of sand banks at nearby Snake Bank cockle fishery is reported to have changed in the past three years due to sand movement in Whangarei Harbour. It is unknown whether similar sand bank movements have occurred at Mair Bank, although it was speculated that Cyclone Bola was largely responsible for a major alteration to the elevation and shape of the bank in the late 1980s. In addition, harvesting pressures by both commercial and non-commercial fishers can also influence stock size and structure, due to the removal of large pipi from beds.
- 8 The absence of a more recent survey prevents an assessment on whether the 1989 biomass and MCY estimates represent the current pipi resource at Mair Bank. As such, MFish considers it inappropriate to use the 1989 MCY estimate as the basis of managing the PPI 1A fishery given that stock biomass and structure may have changed over the past 15 years. While there is some anecdotal information to suggest the Mair Bank fishery remains healthy, adopting a management strategy for the fishery based on information collected in 1989 places the stock at risk, particularly given harvest levels over this time have been considerably less than the MCY estimate. Inappropriate catch levels at Mair Bank may also have implications on the health of nearby pipi beds, and other associated species (ie, cockles, juvenile fish, seabirds, etc.) given the role of pipi in the Whangarei Harbour ecosystem.
- 9 Because of the limitations of the 1989 survey to assess the current state of the PPI 1A fishery, a second survey of the Mair Bank pipi beds is planned for early 2005. This survey will obtain updated information on pipi biomass and stock structure, and will include a new yield estimate for the fishery. The 2005 survey will provide an indication on whether there have been any significant changes in stock status since the 1989 survey.
- 10 MFish agrees the results of the 2005 survey could be available soon after the fieldwork is completed. Steps are being taken to ensure the research provider submits the survey results in time for a possible review of the fishery for the 2005-06 fishing year (if warranted). Under QMS management, there may be incentives for stakeholders to initiate more regular surveys of Mair Bank to provide ongoing assessments of stock status.

TACs, Allowances and TACC setting considerations

Submissions

- 11 HRM supports a TAC of 450 tonnes and a TACC of 400 tonnes for the PPI 1A fishery. It contends that managing the fishery under s 13 of the Fisheries Act 1996 requires you to set a TAC at a level that achieves the Maximum Sustainable Yield (MSY), and that you are bound to use the 1989 MCY estimate in setting this TAC. HRM argues that because the Act requires you to set a TAC for the entire QMA, the

proposed TACC should be set across all pipi beds within Whangarei Harbour. It believes the MCY estimate is accurate and reputable, and provides a sustainable level of fishing with an acceptable level of risk, at all probable levels of biomass. HRM contends the proposed TACC in the IPP provides an excessively conservative approach.

- 12 HRM contends there are several biological factors that protect the pipi fishery from the effects of commercial fishing. These include:
 - A new stock survey proposed for 2005;
 - The harvest of large pipi (>50 mm) by commercial fishers (pipi are mature at about 40 mm+); and
 - The apparent large intertidal and subtidal pipi reserves not available to commercial fishers within Whangarei Harbour to provide areas for non-commercial fishing and sources of spat for future recruitment.
- 13 While HRM accepts information on pipi biomass within other beds is scarce, an annual harvest of between 517-1033 tonnes is estimated for Mair Bank alone. It believes that pipi beds can recover quickly if significant depletion was to occur, due to the movement of pipi during their lifecycle. HRM considers the use of handgathering techniques by commercial fishers has negligible incidental mortality and may enhance the fishery.
- 14 HRM supports the other management measures proposed in the IPP.
- 15 **Te Ohu Kai Moana (TOKM)** does not support the proposed TACC based on commercial catches from Mair Bank alone. The proposed TACC should reflect pipi biomass in other unexploited beds within Whangarei Harbour, which could be utilised if market conditions warrant. TOKM considers the use of a sub-limit for Mair Bank is necessary, if a higher TACC is to apply to all areas within the harbour.
- 16 TOKM supports a TAC of 305 tonnes. Within the TAC, it proposes allowances of 25 tonnes for recreational interests, 25 tonnes for customary interests, and 5 tonnes for other sources of fishing-related mortality (if mechanical harvesting is approved) and a TACC of 250 tonnes. The TACC should include a catch limit of 200 tonnes for Mair Bank only.

MFish Discussion

- 17 MFish agrees the Fisheries Act requires catch levels for stocks managed under s 13 to be set that moves the stock level at, or towards, a level that can produce the MSY. An MCY approach is one way of viewing the MSY. The Act does not prescribe the timeframe within which MSY is achieved. The Act accords you discretion, based on consideration of social, cultural and economic factors you consider relevant, to determine the way and rate a stock is moved towards MSY.
- 18 The basis of managing a fishery under an MCY approach requires the current state of the stock to be known. The 2003 Plenary Report states that "If a stock is fished at the MCY level from a virgin state then over the years its biomass will fluctuate over a range of levels depending on environmental conditions, abundance of predators and

prey, etc. If the current state of the stock is below this range the MCY will be lower". As noted earlier, it is not known whether the biomass and MCY estimates derived from the 1989 survey represent current stock status. MFish therefore considers it inappropriate to use the 1989 survey as the basis to set a TAC for the PPI 1A fishery. Once new yield estimates are obtained from the proposed 2005 survey, it may be appropriate to use this information to manage the fishery under a MCY management strategy given the inherent incentives under the QMS. In the interim, MFish considers it prudent to base the TAC on known or estimated levels of customary, recreational and commercial catches. The proposed TACC is based on commercial catch levels over the past ten years. There are no sustainability concerns under current commercial catch levels.

- 19 MFish does not support a higher TAC and TACC for the PPI 1A fishery. MFish notes that while TOKM support a higher TACC, it considers a 200 tonne catch limit should apply to Mair Bank with additional catch coming from other beds within Whangarei Harbour. While current catch levels are likely to be sustainable, the implications of commercial catches greater than 200 tonnes from the Mair Bank fishery (as well as nearby pipi beds), associated species such as fish and seabirds, and on non-commercial interests are unknown. Pipi are an important food source for harbour fish (particularly juveniles) and seabirds, and are believed to play a significant role in anchoring sand banks within the harbour complex and maintaining water quality. Concerns were expressed in the mid-1980s about the possible adverse effects on sediment dynamics if excessive quantities of pipi were removed from Mair Bank. MFish expects these concerns are valid today. In addition, pipi are an important resource to non-commercial fishers, particularly customary fishers. An increase in commercial fishing effort above current catch levels could have an adverse impact on non-commercial fishers through a reduction in both biomass and pipi size.
- 20 MFish agrees with HRM that there are several biological factors that could lessen the effects of fishing on the stock. These include the recruitment of pipi spat from nearby beds and the relatively quick recovery of pipi numbers in some circumstances. However, such factors should be treated with caution as although Mair Bank is likely to receive pipi spat from spawning events on other beds within Whangarei Harbour, it is also likely that Mair Bank will 'export' pipi spat to these same beds (as larvae are pelagic for about 20 days after spawning). Because the present structure of the pipi beds on Mair Bank is a complex interaction between natural demographic features and the impact of fishing, the effects of reducing biomass of large mature pipi on Mair Bank on the recruitment of pipi into other beds are unknown. Caution is required in making comparisons with other areas because stock structure can vary considerably within a pipi bed. There is also evidence from the nearby Snake Bank cockle fishery to suggest the settlement of juvenile cockles can be reduced by the removal of adult cockles from the beds. Within this fishery, there appears to be an optimal level of biomass to promote recruitment, and as such, the 2003 Fisheries Assessment Plenary considered it prudent to exercise caution in reducing the biomass of adult cockles to ensure recruitment success. The Plenary concerns on effects of reducing adult biomass on the recruitment of juveniles are likely to be applicable to the Mair Bank pipi fishery.
- 21 The application of an informal minimum size limit of 50 mm by commercial fishers does provide a level of protection to the spawning biomass from the effects of fishing.

This size limit is determined by market demand for large pipi. Protection of the spawning biomass would be lower if markets were to demand smaller pipi, particularly under a higher catch limit, and this could have implications on future biomass levels. As such, the ability of the fishery to sustain a higher catch limit is uncertain if commercial fishers decide to harvest smaller pipi.

- 22 MFish agrees with the submissions that the TAC should be based on the entire QMA, and not just for Mair Bank. However, the lack of information about the total available yield within Whangarei Harbour and the uncertainty about recruitment to and from Mair Bank indicates that caution should be taken into account when setting the TAC. Accordingly, MFish proposes to set a TAC for PPI 1A fishery and continue to apply the current restriction on commercial harvesting to a defined area¹ within Whangarei Harbour.
- 23 Retaining the current restriction will constrain the TACC to the defined area only. Within this area, commercial fishers can harvest pipi from both Snake Bank and Mair Bank, although most pipi are taken from the latter. MFish agrees that opening up new areas to commercial fishing is a viable option as improved information comes to hand and there is a discussion with all sectors. However, no consultation has occurred on any proposal to remove the area restriction, and the revocation of this measure is not an inevitable consequence of introducing the stock into the QMS. MFish considers the QMS framework will provide an opportunity for stakeholders to consider measures such as a review of harvest area restrictions using the fisheries plan approach.
- 24 No submissions were received from customary and recreational interests on proposed TAC, TACC and allowances. MFish notes that HRM and TOKM support the proposed allowances for non-commercial interests.
- 25 MFish considers the initial TAC for the PPI 1A fishery should reflect the absence of current stock assessment information on Mair Bank, the interactions between the Mair Bank pipi fishery and other pipi populations within Whangarei Harbour, and likely role of pipi on the wider ecosystem. This approach is consistent with the information principles under s 10 of the Act regarding the uncertainty of information. Accordingly, MFish recommends a TAC and TACC of 250 tonnes and 200 tonnes, respectively. The TAC can be reviewed once new stock assessment information becomes available in 2005.

Social, Cultural and Economic Factors

Submissions

- 26 HRM states the allocation of 20% of quota to Maori under the proposed TACC will reallocate catch history rights away from existing industry participants to TOKM. Setting the TACC at 400 tonnes would overcome this problem to provide sufficient headroom above an estimated catch history of about 337 tonnes. A lower TACC would unnecessary forego seafood, jobs and economic yield.

¹ Regulation 4D of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.

MFish Discussion

- 27 MFish acknowledges the proposed TACC may cause some quota owners to initially receive a smaller quantity of pipi quota in comparison to their respective total reported landings during the 1990-1992 catch history years. However, the Act sets a TACC on the basis of ensuring sustainability while providing for utilisation. The TACC cannot be set to ensure quota owners receive a desired level of allocation of quota.
- 28 Any economic implications that arise under the proposed TACC are likely to be short-term only, and are based on existing arrangements of commercial access being restricted to Mair Bank and current catch levels. HRM's submission fails to recognise the incentives under the QMS framework for quota owners to undertake initiatives to deliver better long-term management outcomes for the fishery. These outcomes may include increased sustainable commercial catches from Whangarei Harbour while mitigating the effects of fishing under a fisheries plan approach. Likely initiatives to improve the economic return from the fishery include improving stock assessment information for existing and new harvest areas, enhancement, reviewing regulatory area restrictions, and catch spreading arrangements to improve harvest efficiency. Quota owners would directly receive the economic benefits that accrue from QMS management through improved fishing efficiency and greater catch returns under both current and future catch levels.

Environmental Considerations

Submissions

- 29 No submissions were received on environmental considerations for pipi.

Schedules

Submissions

- 30 HRM considers there may be a need to include the PPI 1A stock on the Sixth Schedule to enable fishers to return small pipi back to the sea.
- 31 TOKM contends that PPI 1A stock should be included on the Second Schedule as pipi stocks can demonstrate substantial variations over short-time periods. TOKM also supports the stock under the Third Schedule to provide an alternative management strategy to facilitate enhancement, and the Sixth Schedule to enable fishers return small pipi to the sea. TOKM also supports the inclusion of pipi under the Schedule 5A.

MFish Discussion

- 32 MFish does not support the inclusion of the PPI 1A fishery under the Third Schedule at this time. The fishery does not meet the criteria to consider the stock under the alternative options for setting sustainability measures provided by s 14 of the Act. In particular, it is possible to estimate MSY because of the biological characteristics of the species, and the stock is presently not managed on a rotational or enhanced

basis. As rotational and enhanced fishing is feasible for pipi stocks, the PPI 1A fishery may be added to the Third Schedule in the future.

- 33 MFish supports TOKM's views to include the PPI 1A fishery on the Schedule 5A to remove under-fishing rights generated under s 67A of the Act. Under-fishing rights accrue at the end of the fishing year and apply for fishing against ACE in the following year. These rights are calculated as the lesser of either the difference between ACE and the reported catch, or 10% of the ACE. For most QMS shellfisheries, there are no carry-over of uncaught ACE to the next fishing year, as most of these stocks are target species and fishers can manage their harvest to ensure catch does not exceed their ACE. Although the IPP did not propose to include the PPI 1A fishery on Schedule 5A, MFish considers it appropriate to remove under-fishing rights for uncaught ACE into the next fishing year for this fishery. This arrangement currently applies to the nearby Snake Bank cockle fishery, and is consistent with current policy concerning this classification.
- 34 MFish agrees with submissions that the Sixth Schedule should include the PPI 1A fishery to provide fishers with the ability to return small pipi back to the sea. While the method of handgathering is relatively selective in the size of pipi taken by commercial fishers, it is not unusual for small pipi to be taken by this method. Handling mortality of returned pipi is likely to be low if they are quickly returned back to the substrate. Accordingly, MFish recommends the fishery be added to the Sixth Schedule to allow pipi to be returned to the seabed.
- 35 The inclusion of the PPI 1A fishery on the Sixth Schedule will include the requirement that pipi must be likely to survive and must be returned to the waters from which they were taken as soon as practicable. This approach is consistent with the nearby Snake Bank cockle fishery, which also operates under the Sixth Schedule.

Deemed Values and Overfishing Thresholds

Submissions

- 36 TOKM believes it is not sensible to consider pipi as a 'High Value Single Species' stock as it is entirely market driven and has low returns. It contends that pipi is a 'Low Knowledge' stock and should have an annual deemed value rate of \$0.75 per kg. Under this category, a differential deemed value and an overfishing threshold should not apply.

MFish Discussion

- 37 MFish does not agree with TOKM that the PPI 1A fishery is a 'Low Knowledge' stock on the basis that pipi is primarily taken by a method that takes little, if any, bycatch.
- 38 The proposed deemed values for the PPI 1A fishery were calculated using pricing information obtained from an initial 2003 port price survey. The port price for PPI 1A in that survey was \$1.25 per kg. Under the high value single species fishstock category, the annual deemed value is set at 200% of the average port price, and the interim deemed value is set at 50% of the annual deemed value.

- 39 Since the release of the IPP, the 2003 port price survey has updated. The value of PPI 1A has decreased to approximately \$1.10 per kg. MFish proposes to adjust the recommended deemed values to reflect the most recent port price information. MFish now recommends an interim deemed values of \$1.10 per kg and an annual deemed value of \$2.20 per kg for the 2004–05 fishing year.

Other Management Measures

Submissions

- 40 TOKM notes the prime-limiting factor for the commercial exploitation of the Whangarei Harbour pipi fishery will continue to be the availability of markets, rather than pipi abundance. TOKM does not agree with restricting commercial harvesting to Mair Bank and Snake Bank simply because these areas are the traditional harvest areas. TOKM states that it strongly argued for the QMA boundaries to include all of Whangarei Harbour to provide commercial fishers with an opportunity to expand fishing effort into other locations and reduce fishing pressure on the Mair Bank. TOKM took this position because permit holders undertook to avoid fishing in locations within the harbour used by recreational and customary fishers.
- 41 TOKM disagrees with the current restriction on commercial fishers to harvest pipi by handgathering methods only. It notes that non-damaging mechanical harvest devices are used in the Challenger cockle fishery, and there is little advantage in precluding the use of such devices in the PPI 1A fishery.

MFish Discussion

- 42 MFish agrees that opening up new pipi beds to commercial harvesting is a viable option as improved information comes available and there is an opportunity for discussion with tangata whenua and stakeholders. On this basis, MFish considers that TOKM's suggestion to set a TAC, with an area-based commercial catch limit for Mair Bank, to be an option for future years. Although opening up additional areas to commercial harvesting will serve to divert fishing effort away from Mair Bank, it should only occur once the potential for increased sustainable utilisation has been appropriately evaluated. Matters of spatial access may be addressed through agreements between stakeholders and MFish. The continuing use of regulatory closures is a pragmatic interim measure. The regulations could be reviewed as part of the process for developing a stakeholder-initiated management regime.
- 43 MFish does not support the use of mechanical harvest devices to harvest pipi in the PPI 1A fishery at this time. TOKM is correct that mechanical harvesters do not appear to have any detrimental physical effect on the commercial harvest areas in the Challenger cockle fisheries. However, the nature of pipi beds in Whanganui Harbour is different to cockle beds in the Challenger area to prevent a direct comparison on the physical effects of mechanical harvest devices. Pipi generally occur deeper within the substrate than cockles, and would require devices to remove more of the top layer of the substrate to extract pipi. This could have the effect of disturbing a significant amount of sand from the pipi beds, and may have significant implications for associated species such as other molluscs, polychaetes, and worm, as well as an indirect effect on seabirds. Whangarei Harbour is a low energy, sheltered harbour,

whereas commercial areas in the Challenger cockle fishery are based at generally more exposed, higher energy beaches. The physical disturbance caused by mechanical harvesters within Whangarei Harbour would be expected to remain for a greater period of time. As noted earlier, pipi beds are considered to play an important role in the Whangarei Harbour ecosystem in anchoring sand banks, providing a food source for both fish and seabirds, and assisting in maintaining water quality.

- 44 The likely short and long-term effects of the physical disturbance to pipi beds in Whangarei Harbour caused by mechanical harvest devices are unknown. Accordingly, MFish considers it appropriate to continue to restrict commercial fishing to handgathering only. The QMS will provide incentives for quota owners to work with stakeholders to explore harvest methods in the PPI 1A fishery to improve fishing efficiency, while mitigating the effects of fishing on the aquatic environment and on other resource users.

Conclusion

- 45 The IPP proposed a TAC, TACC, and allowances for the PPI 1A fishery. The proposed TAC is based on commercial catch levels from Mair Bank over the past 10 years, together with allowances for customary and recreational interests. While there are no apparent sustainability concerns at current catch levels, the proposed TAC recognises the absence of stock assessment information on current biomass and sustainable yield from the fishery.
- 46 Two submissions were received in response to the IPP. Both submissions consider the proposed TACC is too conservative because it is based on the Mair Bank fishery only. The submissions consider the commercial fishery can support higher catch levels given the apparent high biomass of pipi on Mair Bank and presence of additional pipi beds in Whangarei Harbour that serve to protect the fishery from the effects of overfishing.
- 47 HRM, representing the majority of pipi permit holders, supports a TACC of 400 tonnes to reflect biomass and yield estimates derived from a 1989 survey of the Mair Bank fishery. TOKM supports extending the commercial fishery to all areas within Whangarei Harbour, and favours a TACC of 250 tonnes, with a catch limit of 200 tonnes for Mair Bank.
- 48 No submissions were received from customary and recreational interests on proposed TAC, TACC and allowances.
- 49 MFish considers it inappropriate to use the 1989 survey to determine a TAC for the PPI 1A fishery. There is no information to assess whether this survey represents the current pipi resource on Mair Bank given both pipi biomass and stock structure may have changed over the past 15 years. Spatial and temporal fluctuations may have changed stock structure during this period. While anecdotal information suggests the Mair Bank fishery remains healthy, a significant increase in catches above current levels may place the stock at risk, as well as have a negative effect on associated species and non-commercial fishers.

- 50 MFish considers it appropriate to set an initial TAC of 250 tonnes and a TACC of 200 tonnes for the PPI 1A fishery. This approach is appropriate for the following three main reasons:
- a) The absence of current stock assessment information on the Mair Bank fishery;
 - b) The interactions between the Mair Bank pipi fishery and other pipi populations within Whangarei Harbour; and
 - c) The likely role of pipi on the wider ecosystem.
- 51 The TAC can be reviewed once new stock assessment information becomes available.
- 52 MFish supports retaining the current fisheries regulations that restrict commercial fishing to Mair Bank (and Snake Bank), and to the method of handgathering only at this time. There are merits in opening up new pipi beds to commercial harvesting once improved information comes available on other pipi beds in Whangarei Harbour, and there is an opportunity for discussion with stakeholders. MFish does not support the use of mechanical harvest devices to harvest pipi in the PPI 1A fishery at this time. The QMS will provide incentives for stakeholders to explore existing management measures to improve the economic return from the fishery, while mitigating the effects of fishing on the aquatic environment and on other users.
- 53 In addition to the proposals outlined in the IPP, MFish recommends including the PPI 1A fishery on the Schedule 5A to remove under-fishing rights generated under s 67A of the Act, and on the Sixth Schedule to allow fishers to return small pipi back to the sea. The inclusion of the fishery on these schedules is consistent with the nearby Snake Bank cockle fishery.

Final Recommendations

- 54 MFish recommends that you:
- a) **Agree** to set a TAC of 250 tonnes for PPI 1A and within the TAC set:
 - i) A customary allowance of 25 tonnes;
 - ii) A recreational allowance of 25 tonnes;
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 200 tonnes.
 - b) **Agree** to remove reference to a 200 kg daily limit for commercial harvest of pipi in PPI 1A from Regulation 22A of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
 - c) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to introduce a fishstock code for Whangarei pipi to be used by commercial fishers when completing their statutory catch returns.
 - d) **Agree** pipi (PPI 1A) be added to Schedule 5A of the Fisheries Act 1996.
 - e) **Agree** pipi (PPI 1A) be added to Sixth Schedule of the Fisheries Act 1996.

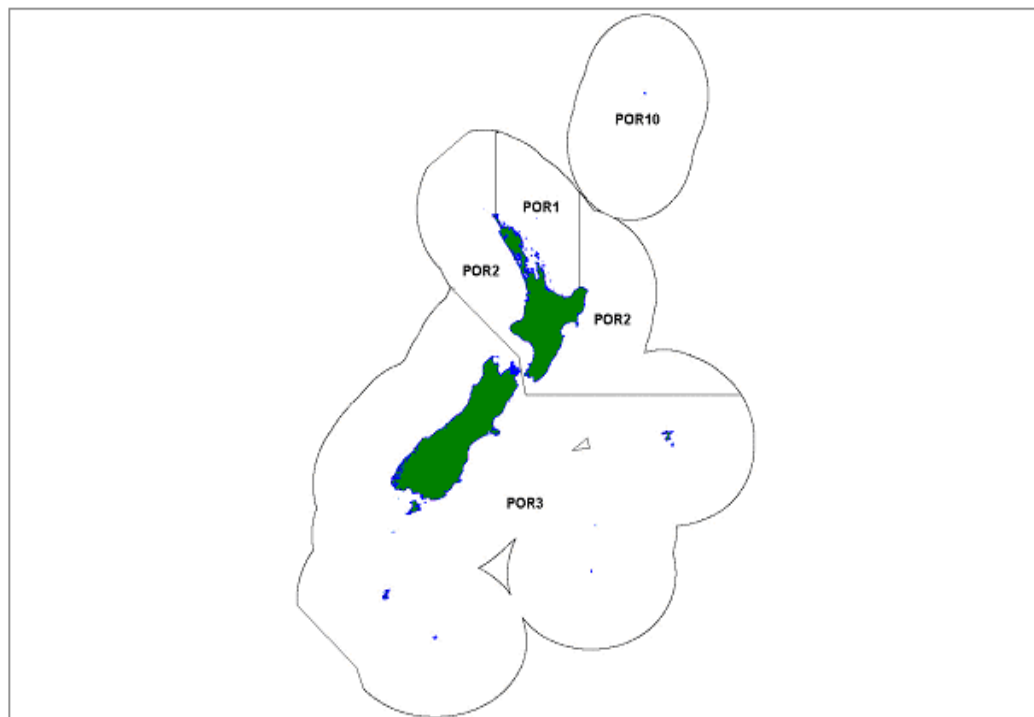
- f) **Agree** to set an interim deemed values of \$1.10 per kg and an annual deemed value of \$2.20 per kg for the 2004–05 fishing year.

PORAE (POR) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Porae (*Nemadactylus douglasii*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Areas (QMAs) for porae are shown in Figure 1. The fishing year for porae will be from 1 October to 30 September, and Total Allowable Commercial Catches (TACCs) and Annual Catch Entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: QMAs for porae



Key Issues to be Considered

- 2 The key issues to be considered for porae are as follows:
 - a) The biological and ecological characteristics of porae suggest it is vulnerable to the effects of fishing and habitat disturbance because this species tends to aggregate and form localised populations with distinctive home ranges, and may have low productivity;
 - b) Porae is primarily taken as a bycatch in the target snapper and trevally set net fisheries in northern New Zealand. No fishery independent stock assessment information is available. It is not known whether the porae stocks are at, above or below B_{MSY} , and there is a risk that increased catches could threaten the sustainability of existing porae stocks. MFish is not aware of any concerns regarding the sustainability of the porae stocks under current catch levels; and
 - c) Reported commercial landings of porae in the main fisheries appear to be stable. While current non-commercial catches are likely to be low, it is

probable that catches will increase in the future due to an increasing population in northern New Zealand.

Summary of Management Proposals

3 The following TACs, TACCs, and allowances are proposed for porae (Table 1).

Table 1: Proposed TACs, TACCs, and allowances for porae (tonnes)

Stock	TAC	Recreational allowance	Customary allowance	Other sources of mortality	TACC
POR 1	75	6	3	4	62
POR 2	9	1	1	1	6
POR 3	5	1	1	1	2
POR 10	4	1	1	1	1

4 It is also proposed to:

- a) Amend the reporting regulations to ensure the appropriate fishstock codes for porae are used to report commercial catches;
- b) Set an interim deemed value of \$0.22 per kg and an annual deemed value of \$0.44 per kg for the 2004–05 fishing year; and
- c) Include porae within the combined 20 finfish daily bag limit for recreational fishers around the North Island.

TACs

TAC Management Strategy

- 5 MFish proposes to set TACs for porae stocks using the provisions under s 13 of the Fisheries Act 1996 (the Act).
- 6 As an alternative to setting a TAC under s 13, the Act allows TACs to be set under s 14 in respect to any quota management stock listed in the Third Schedule. By Order in Council, the Governor-General may add to that Schedule the name of any stock provided one of the three criteria specified in s 14(8) applies to that stock. However, MFish does not consider that any of the criteria specified are applicable to porae. Firstly, a maximum sustainable yield (MSY) could be estimated for porae stocks. Secondly, a catch limit for New Zealand has not been determined as part of an international agreement. And finally, there is currently insufficient rationale to support management on a rotational or enhanced basis.
- 7 Section 14B of the Fisheries Act provides a further fishstock management option for setting a TAC. This provision enables the Minister to set a TAC that maintains a stock at a level below B_{MSY} that ensures its long-term viability to allow inter-related stocks to be taken at a TAC level based on B_{MSY} . MFish notes there is an absence of information to support such a strategy for porae.

Rationale for Proposed TACs

- 8 Before setting (or varying) any sustainability measure (which includes a TAC), the Minister must consider a range of factors as outlined under the Statutory Considerations sub-heading.
- 9 Porae is a common inshore species in northern New Zealand. It is principally caught as a bycatch in set net fisheries that target snapper and trevally. Some porae is also taken by bottom longlining and trawling when targeting snapper. Because no fishery independent information is available for porae, it is not known whether stocks are at, above, or below B_{MSY} . However, MFish is not aware of any sustainability concerns for porae stocks at this time, and reported landings in Fisheries Management Areas (FMAs) 1 and 2 appear to be stable following a period of declining catches in the early 1990s (refer Table 2). The apparent stability of the main fisheries around the North Island suggests existing catches are at sustainable levels.

Table 2: Reported landings (tonnes) of porae by FMA, fishing years 1989–90 to 2002–2003

Year	Reported landings FMA						
	1	2	3	7	8	9	10
1989–90	98	4	< 1	< 1	< 1	0	0
1990–91	115	2	0	0	< 1	4	0
1991–92	121	5	< 1	0	0	3	0
1992–93	121	8	0	1	< 1	< 1	0
1993–94	77	12	2	0	< 1	1	< 1
1994–95	109	5	0	0	< 1	1	< 1
1995–96	94	8	< 1	< 1	< 1	4	0
1996–97	80	7	< 1	1	< 1	2	0
1997–98	75	4	< 1	< 1	< 1	3	0
1998–99	58	3	3	< 1	< 1	1	0
1999–00	55	4	< 1	2	< 1	1	0
2000–01	64	2	1	< 1	< 1	2	0
2001–02	55	3	1	< 1	< 1	< 1	0
2002–03	61	2	< 1	0	< 1	1	0

- 10 There is an absence of fishery independent stock assessment information to assess stock status. Therefore, MFish proposes to set TACs to constrain catches at current levels to reflect the apparent stability within the existing fisheries.
- 11 Maintaining current catch levels until there is more information to assess stock status is considered appropriate, as porae is likely to have a limited population size, and it is vulnerable to the effects of fishing, particularly localised depletion. This species tends to aggregate on or close to coastal reef areas to form small to large groups, which are relatively territorial in nature with individuals occupying distinctive long-term home ranges. In addition, this species may have a low productivity given it is a relatively long lived species (with ages of at least 30 years being reached).
- 12 These attributes suggest that porae is susceptible to the effects of fishing and habitat disturbance. An increase in fishing effort in the associated target fisheries, or increased targeting of porae, is likely to result in increased catches of this species.

This may lead to localised depletion, particularly if catches are concentrated in few areas, and the rate of recovery from such a state is unknown.

- 13 Given the lack of information on the sustainable yields and biology of this species, MFish considers that TACs based on current catch levels will achieve the right balance in providing for utilisation while ensuring sustainability.
- 14 MFish considers the proposed TACs should ensure that porae is managed at a level at or above B_{MSY} as required by s 13 of the Fisheries Act. Since the available information suggests porae is primarily taken by commercial fishers, the proposed TACs (and TACCs) outlined in Table 1 are based largely on recent reported commercial landings. The proposed TACs are developed by combining the proposed TACCs with allowances for non-commercial catch, and other sources of fishing-related mortality. (Further information on species biology is contained in Annex One).

POR 1

- 15 POR 1 is the principle porae fishery, where most catches are taken as a bycatch of the northern inshore set net fishery (refer Table 2). Annual commercial landings were relatively large in the early 1990s and were about 120 tonnes. Since this period, reported landings have approximately halved and have been relatively stable in the last six years (1997-98 to 2002-03). It is not known whether the decline in reported landings is because of reduced stock size or whether it reflects a change in fishing effort in the associated target set net fisheries. The average reported landing in the last six years is 62 tonnes.
- 16 MFish proposes to set a TAC at 75 tonnes. The TAC is based on the average reported commercial landings in the last six years, and incorporates allowances for customary and recreational fishers, and other sources of fishing-related mortality.

POR 2

- 17 Minor catches of porae are taken in POR 2, incorporating FMAs 2, 8 and 9. Although highest landings were reported during 1993-94 and 1995-96 in FMA 2, landings have been relatively stable in the last six years (1997-98 to 2002--03). The average reported landing for the last six years is 6 tonnes.
- 18 MFish proposes to set a TAC at 9 tonnes. The TAC is based on the reported average commercial landings in the last six years, and incorporates allowances for customary and recreational fishers, and other sources of fishing-related mortality.

POR 3

- 19 Small catches are taken in POR 3, incorporating FMAs 3, 4, 5, and 6, and reflect the general northern distribution of this species. The annual reported commercial landing of porae in the last six years is about 2 tonnes.
- 20 MFish proposes to set a TAC at 5 tonnes, and incorporates allowances for customary and recreational fishers, and other sources of fishing-related mortality.

POR 10

- 21 Very small catches of porae (less than 1 tonne) were reported from the Kermadec FMA in the early 1990s. The lack of reported catches reflects the isolation of the QMA and the presence of a marine reserve around the Kermadec Islands that prevents fishing over habitats where porae is generally found. It is possible that porae catches may be taken from reefs and pinnacles outside the reserve areas.
- 22 MFish proposes to set a TAC at 4 tonnes, and incorporates allowances for customary and recreational fishers, and other sources of fishing-related mortality.

Allocation of TAC

Recreational allowance

- 23 The National Marine Recreational Fishing surveys in 1994, 1996, and 2000 do not provide estimates of recreational catches of porae. This species is likely to be periodically caught by recreational fishers in northern areas when handlining and set netting for higher value species such as snapper and tarakihi, and by being targeted opportunistically by spearfishing. Nevertheless, current recreational catch levels are considered to be low, and will be mainly confined to POR 1. Because of the expected increase in population growth in northern New Zealand, there is likely to be an increase in the number of recreational fishers and this will lead to greater non-commercial catches of porae.
- 24 When considering the allowance for recreational interests in each of the porae QMAs, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made pursuant to s 311 of the Act (s 21(5) of the Act). No such regulations have been made.
- 25 In the absence of any quantitative estimates of recreational harvest of porae, MFish considers it appropriate to base a recreational allowance of 10% of the average commercial catch for POR 1. This approach reflects the large numbers of recreational fishers in northern New Zealand, and the likely increase in fishing effort as a result of an increasing population. Accordingly, MFish proposes a recreational allowance of 6 tonnes for this stock.
- 26 Porae is less abundant in POR 2, and even less so in POR 3. Accordingly, MFish proposes a recreational allowance of 1 tonne for both POR 2 and 3 to reflect a general lack of abundance of this species within these areas.
- 27 A recreational allowance of 1 tonne is proposed for POR 10, in recognition of the northern distribution of this species, the isolation of the QMA, and the presence of a marine reserve around the Kermadec Islands.

Customary Māori Allowance

- 28 In considering the proposed allowances for customary non-commercial interests, the Minister is required to take into account any mātaihai reserve or s 186A closure in the relevant QMA (s 21(4) of the Act). MFish does not consider that the allowances proposed for customary catches will detract from the intent of any mātaihai or s 186A

closure presently in place, nor will the allowance be likely to be insufficient in terms of the customary use of porae in these areas.

- 29 Porae is not considered to be of particular importance to Māori, and there is no known level of customary catch. Therefore, customary catch of porae is considered to be low. MFish considers it appropriate to set an allowance for customary interests in POR 1 based on 50% of the proposed recreational allowance. Accordingly, it is proposed to set an allowance of 3 tonnes for POR 1. A customary allowance of 1 tonne is proposed for POR 2, 3 and 10, respectively.

Allowance for other sources of mortality

- 30 The level of illegal take of porae is likely to be minor given it is a relatively low value species. It is likely that some porae will be discarded by non-commercial fishers, as well as other indirect fishing-related mortality through the escapement of fish from nets.
- 31 MFish considers it appropriate to include an allowance for other sources of fishing-related mortality when determining each TAC. It is considered appropriate to set an allowance of 5% of the TACC and proposed customary and recreational allowances for POR 1, and an allowance of 1 tonne for the other stocks. This corresponds to proposed allowances of 4 tonnes for POR 1, and 1 tonne for POR 2, 3 and 10, respectively.

TACC

- 32 MFish proposes that TACCs be set based on reported commercial landings (refer Table 3) used to determine the TACs.
- 33 MFish proposes to set a TACC at 62 tonnes for POR 1 based on the average reported commercial landings over the last six years (1997-98 to 2002-03). This period represents relatively stable catches following a period of decline.
- 34 A TACC of 6 tonnes is proposed for POR 2 based on the same six-year period, again to reflect a period of stable catches. A TACC of 2 tonnes is proposed for POR 3 to reflect small catches around the top of the South Island. A TACC of 1 tonne is proposed for POR 10 to reflect the northern distribution of this species, the isolation of the QMA, and the presence of a marine reserve around the Kermadec Islands.

Other Management Measures

Amateur daily bag limit

- 35 There is no daily limit on the quantities of porae that can be currently taken by recreational fishers. Due to concerns about the species' vulnerability to the effects of fishing, and the likelihood that future recreational catches will increase, MFish considers a daily bag limit for porae is necessary to restrict recreational catches. Accordingly, MFish proposes to include porae as part of the combined 20 finfish daily bag limit. Most of the other common inshore species associated with porae catches (eg, snapper, tarakihi and trevally) already have daily bag limits. The proposed daily bag limit will assist to ensure that porae catches will remain sustainable.

- 36 The proposed daily bag limit will apply to waters around the North Island. As porae will be seldom caught by amateur fishers around the South Island, given the largely northern distribution of this species, MFish considers it unnecessary to propose an amateur bag limit for waters surrounding the South Island and the Chatham Islands.
- 37 The proposed daily bag limit will be implemented by amending the relevant amateur fishing regulations that apply to the North Island.

Consequential amendment to regulations

- 38 As a consequence of introducing porae into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the appropriate fishstock codes are used to report commercial catches.
- 39 Details of the proposed amendments are set out in a generic section of this paper.

Deemed value and overfishing threshold

- 40 The proposed deemed value for porae is set on the basis that this species is considered to fall within the low knowledge fishstock category. MFish proposes that the annual deemed value is set at 60% of the average port price, and the interim deemed value is set at 50% of the annual deemed value.
- 41 MFish proposes to set an interim deemed value at \$0.22 per kg and a final deemed value of \$0.44 per kg for porae for the 2004-05 fishing year. The deemed value is set using a port price of \$0.74 per kg (based on the December 2003 MFish port price survey).
- 42 Consistent with the policy framework for deemed values and overfishing thresholds, MFish does not propose to set differential deemed values or overfishing thresholds or tolerances for porae.

Statutory Considerations

- 43 In forming the management options for porae, the following statutory considerations have been taken into account:
- a) The purpose of the Act (as provided in s 8) is to provide for the utilisation of fisheries resources while ensuring sustainability. The management proposals seek to ensure sustainability of the fishstocks by setting TACs and other appropriate measures (including deemed values and a proposed amateur daily bag limit). Utilisation is provided by setting allowances for commercial, recreational and customary fishers;
 - b) The TAC set under s 13 of the Act should be set at a level that moves the stock towards a level that can produce the MSY. There is no fishery independent stock assessment information to assess where each stock level is at in relation to MSY at this time. However, the proposed TACs are based on recent commercial catch levels, which appear to be stable over the last six years. MFish is not aware of any sustainability concerns about current catch levels. The apparent stability of recent catch levels means that utilisation at current

levels can be provided for without posing any known risk to the sustainability of porae stocks;

- c) No specific environmental conditions affecting the stock have been identified (as required to be considered under s 13(2)(b)(ii)). Poraie is found in inshore coastal areas of northern New Zealand, and may be vulnerable to the effects of fishing and habitat disturbance. Growth, morphometrics, and recruitment may vary within and between areas and may be influenced by factors such as water temperature and food availability;
- d) Relevant biological characteristics have been considered in setting the stock management proposals for porae (as required to be considered under s 13(2)(b)(ii)). Poraie is generally found in northern inshore waters of New Zealand, usually associated on or close to coastal reefs. Adults tend to aggregate and form localised populations with distinctive home ranges, and individuals are thought to occupy the same area for many years. This species is also understood to be long lived with low productivity. These biological attributes suggest that this species is vulnerable to the effects of habitat disturbance;
- e) Section 9(a) requires the maintenance of associated or dependent species above a level that ensures their long-term viability. Poraie live in close proximity to a variety of other species associated with coastal areas. Other than as juveniles (when it will be prey to predatory fish), porae probably has no direct relationship with other fish species. It is unlikely to be sufficiently abundant to have an impact on food sources, although there will be some competition for both food and habitat with other species living over the sandy seafloor near reefs;
- f) Several important inshore species (eg, snapper, tarakihi, and trevally) are associated with porae due to the use of set nets for commercial harvesting. The precise nature of any interactions between porae and associated species are unknown. All the associated target species are managed within the QMS, which enables a multi-species management approach to be developed;
- g) Section 9(b) requires the maintenance of biological diversity to be taken into account. Poraie is principally caught as a bycatch in set net fisheries. This method can potentially impact on species diversity by indiscriminately catching a wide range of coastal species, including protected marine mammals. The effects of the porae fishery on the aquatic environment are likely to remain unchanged under the proposed TAC levels. The proposed TACs are unlikely to lead to any redistribution of fishing effort into new areas;
- h) Section 9(c) requires the consideration of protection of habitats of particular significance to fisheries management. No habitats of particular significance to fisheries management have been identified that would be impacted on by the harvesting of porae by set nets. MFish is not aware of any significant environmental issues linked to the set net fisheries taking porae as a bycatch. As noted, the effects of the porae fishery on the aquatic environment are likely to remain unchanged under the proposed TACs. Given the bycatch nature of the porae fishery, it is not anticipated that setting TACs for porae will result in new areas being fished;

- i) Section 13(3) requires the consideration of relevant social, cultural, and economic factors when determining the way and rate in which a stock is moved towards or above B_{MSY} . There are likely to be social and economic effects associated with the proposed TACs, although the precise nature of these effects cannot be readily quantified. The most obvious effect will be on the associated target fisheries and the need to balance catches with ACE or to pay a deemed value. The availability of ACE is determined by the extent of the proposed TACCs. If the TACC is too low, then there could be an unwarranted economic effect on the associated target fisheries because commercial fishers may have insufficient ACE to cover catches of porae. The requirement to land porae catches taken as bycatch may have practical implications on the associated target fisheries (eg, freezer space limitations) because of the small size of vessels associated with the inshore set net and trawl fisheries. The possible effects as noted above, are most likely to occur in POR 1 where most porae catches are taken. The proposed TACCs attempt to balance the adverse effects of fishing on porae while maintaining catches at current levels;
- j) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks, and the maintenance of biodiversity). There are no international obligations specific to porae. MFish considers issues arising under the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for porae;
- k) Section 11(1)(b) provides that the Minister must take into account existing controls when setting or varying a sustainability measure such as a TAC. On 1 October 2004, this species will be managed under the QMS framework, and TACs, TACCs, and allowances will be set for the various fishstocks. No minimum size limit applies to the amateur or commercial fisheries, and there is no amateur daily bag limit at this time. It is proposed to include porae as part of the combined 20 finfish daily bag limit for the North Island. A list of specific controls is contained in Annex One;
- l) There is no proposed or existing fisheries plan that would otherwise have to be taken into account when setting the TACs for the porae fishstocks. No decisions have been made to require services in this fishery;
- m) MFish is not aware of any considerations in any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to setting TACs for porae at this time;
- n) As required under s 11(2)(c), the Minister must take into account whether the management proposals conflict with the requirements of the Hauraki Gulf Marine Park Act 2000. The proposed TACs will allow for the sustainable utilisation of the species by all those with fishing interests. Catches of porae within the park boundaries are likely to be better reported and managed under the QMS;
- o) The nature of the fishery and interests of the respective fishing sectors have been considered in setting the TAC, TACC, and allowances for customary and recreational interests and all other mortality to the stock caused by fishing; and

- p) The best available information on the status of porae is derived from a report prepared by NIWA under contract to MFish. There is no other stock assessment information on this species, other than generalised descriptions of biology and distribution. The absence of information is not a reason for failing to provide for utilisation at levels considered to be sustainable. In accordance with s 10 of the Fisheries Act, the absence of, or uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

Preliminary Recommendations

44 MFish recommends that the Minister:

- a) **Agrees** to set a TAC of 75 tonnes for POR 1, and within the TAC set the following:
- i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 6 tonnes;
 - iii) An allowance for other fishing-related mortality of 4 tonnes; and
 - iv) A TACC of 62 tonnes.
- b) **Agrees** to set a TAC of 9 tonnes for POR 2, and within the TAC set the following:
- i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance for other fishing-related mortality of 1 tonne; and
 - iv) A TACC of 6 tonnes.
- c) **Agrees** to set a TAC of 5 tonnes for POR 3, and within the TAC set the following:
- i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance for other fishing-related mortality of 1 tonne; and
 - iv) A TACC of 2 tonnes.
- d) **Agrees** to set a TAC of 4 tonnes for POR 10, and within the TAC set the following:
- i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance for other fishing-related mortality of 1 tonne; and
 - iv) A TACC of 1 tonne.
- e) **Agrees** to include porae as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986.

- f) **Agrees** to include porae as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.
- g) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to prescribe a code for porae to be used by commercial fishers when completing their statutory catch returns.
- h) **Agrees** to set an interim deemed value of \$0.22 per kg and an annual deemed value of \$0.44 per kg for the 2004-05 fishing year.

ANNEX ONE

Species Information

Species Biology

- 45 Porae (*Nemadactylus douglasii*) is a common inshore species of northern New Zealand (Kermadec Islands, west Auckland and Northland, east Northland, Hauraki Gulf, and the Bay of Plenty). It is also found at some localities as far south as Kapiti Island, Cook Strait and Kaikoura over the summer months, but has not been recorded around the Chatham Islands.
- 46 Porae occurs on or near shallow coastal reefs, usually around areas where there is also a sandy seafloor. It is most commonly found in the depth range of 10–60 m, but can extend out to depths of over 100 m.
- 47 Porae is active during the day and tends to aggregate to form small to large groups over sandy areas. Adults are thought to occupy distinctive home ranges, with individuals residing in the same area for many years. A study along the east coast of Northland recorded an average of 200 porae for each kilometre of rocky coastline.
- 48 The average size of porae is about 40–60 cm, reaching at least 70 cm in New Zealand and Australia. Although there are no published studies, juvenile porae are believed to grow quite rapidly, while adult growth is understood to be much slower with ages of at least 30 years being reached.
- 49 Very little is known about the reproductive biology of porae, but it is thought that spawning occurs in late summer and autumn. It has an extended planktonic post-larval stage. Juveniles settle to the seafloor at about 8–10 cm.
- 50 Porae lives in close proximity to a variety of other species associated with coastal reefs. Other than as juveniles (when it will be prey to predatory fish), it probably has no direct relationship with other fish species. It is unlikely to be sufficiently abundant to have an impact on food sources, although there will be some competition for both food and habitat with other species living over the sandy seafloor near reefs.
- 51 There is no fishery independent stock assessment information to determine the stock status of porae. Biomass estimates are not determined for this species.

Fisheries Characteristics

Commercial catch

- 52 Commercial catches of porae throughout New Zealand are generally small (refer Table 3). Annual catches in FMA 1, where the majority of porae is caught, have approximately halved since the early 1990s and have become stable in the last six years (1997-98 to 2002-03). Catches in FMAs 2, 3, 7, and 9 have remained low. No catches have been reported from FMAs 4, 5, and 6.

Table 3: Reported landings (tonnes) of porae by FMA, fishing years 1989–90 to 2002–2003

Year	Reported landings FMA						
	1	2	3	7	8	9	10
1989–90	98	4	< 1	< 1	< 1	0	0
1990–91	115	2	0	0	< 1	4	0
1991–92	121	5	< 1	0	0	3	0
1992–93	121	8	0	1	< 1	< 1	0
1993–94	77	12	2	0	< 1	1	< 1
1994–95	109	5	0	0	< 1	1	< 1
1995–96	94	8	< 1	< 1	< 1	4	0
1996–97	80	7	< 1	1	< 1	2	0
1997–98	75	4	< 1	< 1	< 1	3	0
1998–99	58	3	3	< 1	< 1	1	0
1999–00	55	4	< 1	2	< 1	1	0
2000–01	64	2	1	< 1	< 1	2	0
2001–02	55	3	1	< 1	< 1	< 1	0
2002–03	61	2	< 1	0	< 1	1	0

53 Porae is principally caught as a bycatch in inshore set net fisheries in northern New Zealand (refer Tables 4 and 5). The species is generally taken in association with snapper and trevally in east Northland and Coromandel, and tarakihi and blue moki around Gisborne. A small quantity is caught in the bottom longline snapper fisheries, and even smaller catches in the snapper trawl fisheries, in east Northland and Ninety Mile Beach.

Table 4: Estimated catch (tonnes) of porae by target species, fishing years 1989–90 to 2001–2002.

Fishing Year	Target Species									
	Trevally	Snapper	School shark	Rig	Tarakihi	Porae	Kingfish	Kahawai	Moki	Other ¹
1989–90	20	21	4	3	2	32	1	3	1	4
1990–91	23	27	7	1	2	2	4	7	< 1	7
1991–92	23	28	7	1	4	2	2	3	< 1	2
1992–93	24	20	2	2	5	2	1	2	2	6
1993–94	13	25	2	12	9	< 1	2	2	3	4
1994–95	37	26	7	12	2	< 1	5	1	1	5
1995–96	29	24	3	3	8	1	6	1	1	5
1996–97	25	23	3	2	4	0	< 1	< 1	3	4
1997–98	31	20	< 1	2	2	0	0	< 1	1	2
1998–99	16	14	1	2	2	< 1	0	0	< 1	8
1999–00	16	18	1	2	2	1	< 1	< 1	< 1	5
2000–01	15	21	6	2	1	< 1	< 1	< 1	1	2
2001–02	15	19	2	< 1	1	< 1	0	< 1	< 1	3

Note:

1. “Other” target species include (in descending order of importance) grey mullet, gurnard, flatfish, blue warehou, John dory, groper, red moki, plus 40 other species, several of which seem unlikely and imply unresolved errors in the database.

Table 5: Reported catch (as bycatch) of porae by QMA, method, and target species, and list of the main statistical areas in which catches were reported

QMA	Method	Target species	Main statistical areas	Mean QMA catch (tonnes) ¹	
				By fishery ²	All fisheries ³
1	Longline	Snapper	2, 3, 5, 8	10	57
	Trawl	Snapper	5	1	
	Setnet	Trevally	2, 3	21	
	Setnet	Snapper	2, 3, 8	20	
	Setnet	School shark	2	3	
	Setnet	Rig	2, 3, 8	3	
	Setnet	Porae	3	3	
2	Setnet	Blue moki	13	1	2
	Setnet	Tarakihi	13	1	
9	Longline	Snapper	47	< 1	2
	Trawl	Snapper	47	< 1	

Notes:

1 For fishing years 1989–90 to 2001–02

2 By method and target species for the whole QMA.

3 Bycatch in all fisheries within QMA, including minor fisheries not listed separately.

54 Most vessels reported catches of less than 100 kg. Almost no vessels reported catches greater than 10 tonnes. The number of vessels reporting catches has declined steadily during the 1990s, with the greatest decline occurring for the vessels reporting very small landings (less than 100 kg per year).

55 There is a possibility that porae catches may be underreported because of confusion by fishers to distinguish porae from parore, as well as the similarity between reporting codes (ie, POR and PAR). These two species have different habitats, but both occur in shallow northern waters, and their overlap in the records from inshore fisheries may not always be easy to discern.

Customary and recreational catch

56 There is no quantitative information on customary harvest levels of porae. Customary fishers are likely to catch small quantities of porae when targeting other species such as snapper, tarakihi and trevally.

57 There is likely to be some recreational catches in northern areas as a bycatch of other species such as snapper, tarakihi and trevally. These catches are most likely taken by the method of handlines and set nets. Opportunistic targeting of porae is also likely when spearfishing.

Regulatory Framework

58 There are no existing regulations that specify catch limits or other sustainability measures for porae. There is no minimum size limit for amateur or commercial fishers for this species. There is no species-specific bag limit restriction on porae for amateur fishers.

- 59 When set netting for porae, recreational fishers can only use one 60 m long set net, which must not be set within 60 m of another net, and must not extend more than one-quarter of the width of any river, stream, channel, bay or sound. Specific minimum mesh sizes apply to the commercial and recreational set net fisheries, and the commercial trawl fisheries in the various associated target species. There are various method and area restrictions that apply to commercial and recreational fisheries to protect marine mammals, seabirds and other aquatic life.

Fishery Assessment

- 60 There has been no scientific assessment on the maximum sustainable yield for porae stocks. The reference or current biomass of any of the porae stocks is unknown.

Environmental Issues

- 61 Environmental issues in relation to the porae fishery are discussed in the main section under the Rationale for Proposed TACs sub-heading.

Current and Potential Research

- 62 There has been no directed fisheries research specific to porae, and no directed research is planned for the next two to three years.

Social, economic, or cultural factors

- 63 MFish is not aware of any information on particular social, economic, or cultural matters that could influence the setting of TACs and TACCs for porae beyond those considered in the main section.

PORAE (POR) – FINAL ADVICE

Initial Proposal

- 1 MFish proposed to set and allocate the TAC for each porae (*Nemadactylus douglasii*) stock as outlined in Table 1.

Table 1: Proposed TACs (in tonnes), TACCs and other allowances for porae stocks:

Stock	TAC	Recreational allowance	Customary allowance	Other sources of mortality	TACC
POR 1 (FMA 1)	75	6	3	4	62
POR 2 (FMAs 2,8,9)	9	1	1	1	6
POR 3 (FMAs 3-7)	5	1	1	1	2
POR 10 (FMA 10)	4	1	1	1	1

- 2 MFish also proposed to amend Part 1 of Schedule 3 of the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for porae, to set an interim deemed value of \$0.22 per kg and an annual deemed value of \$0.44 per kg, and to include porae as part of the 20 finfish combined species recreational bag limit in Fisheries Management Areas (FMAs) 1, 2, 8 and 9.

Biological and Fishery Information

Submissions

- 3 No submissions were received on biological and fishery information for porae.

TACs, Allowances and TACC setting considerations

Submissions

- 4 The **Northern Inshore Fishing Company Ltd** supports the setting of TACs for porae under s 13 of the Fisheries Act (the Act). The company agrees with the IPP to use reported commercial landings from 1993-04 to 2002-03 as the method of setting the TACC for POR 1.
- 5 **Te Ohu Kai Moana** (TOKM) agrees that porae stocks are not at risk under current catch levels, but the aggregating nature of the species creates potential for overfishing. TOKM notes the absence of stock assessment information requires TACs based on commercial catch landings. TOKM accepts the proposed TACs, allowances and TACCs at this time, but is concerned the proposed recreational allowances do not reflect the true level of porae catches or the likely expansion of those catches in northern New Zealand. TOKM strongly urges intensive education and compliance efforts to ensure recreational take does not exceed the proposed allowances.

MFish Discussion

- 6 MFish notes the submissions received on the IPP support the setting of sustainability measures under s 13 of the Act. The submissions also support the proposed TAC, TACC, and allowances for each fishstock, and the methodology for calculating the TACs. MFish agrees with TOKM that while there is no evidence that current catch levels are unsustainable, porae is vulnerable to the effects of fishing and habitat disturbance as a consequence of its biological characteristics (ie, an aggregating species in coastal reefs areas, with individuals forming distinctive long-term home ranges). The proposed TACs provide a balance to ensure the fishstocks remain sustainable, while allowing fishers to continue to utilise porae at current catch levels
- 7 MFish notes TOKM's concerns over the proposed recreational allowances for the two North Island stocks and the likely expansion of recreational catches in northern areas. MFish considers the proposed allowances for recreational interests are appropriate given the absence of any quantitative information of known recreational harvest levels. The recreational sector did not provide additional information on recreational harvest estimates for porae. MFish accepts that while recreational catches of porae are probably small, catches are likely to increase as the number of recreational fishers in the North Island increases, and the potential for some fishers to target porae as an alternative fish species. The IPP identifies the potential problem of an increasing recreational harvest to impact on localised porae populations, and proposes to address this matter by imposing a daily catch limit on recreational fishers in the North Island.

Social, Cultural and Economic Factors

Submissions

- 8 No submissions were received on social, cultural and economic factors for porae.

Environmental Considerations

Submissions

- 9 No submissions were received on environmental considerations for porae.

Deemed Values and Overfishing Thresholds

- 10 The **Northern Inshore Fishing Company Ltd** accepts the inclusion of porae under the low knowledge fishstock category for deemed values.

MFish Discussion

- 11 The submissions do not raise any issues concerning deemed values for porae as stated in the IPP.
- 12 The proposed deemed values for porae were calculated using pricing information obtained from an initial 2003 port price survey. The port price for porae in that survey was \$0.74 per kg. Under the 'low knowledge' fishery category, the annual

deemed value is set at 60% of the average port price, and the interim deemed value is set at 50% of the annual deemed value.

- 13 The 2003 port price survey has been recently updated since the release of the IPP. The updated survey increases the value of porae to approximately \$1.15-2.25 per kg. MFish proposes to adjust the recommended deemed values to reflect the most recent port price information. MFish now recommends interim and annual deemed values for each fishstock for the 2004-05 fishing year as set out in Table 2.

Table 2: Proposed interim and annual deemed values for each porae fishstock for the 2004-05 fishing year

Fishstock	2003 Port Price (\$/kg)	Interim deemed value (\$/kg)	Annual deemed value (\$/kg)
POR 1	2.2511	0.68	1.35
POR 2	1.1575	0.35	0.69
POR 3	2.2511	0.68	1.35
POR 10	2.2511	0.68	1.35

- 14 MFish notes that low knowledge fishstocks are to be reclassified into another category within five years or once MFish has more confidence in the TACC, whichever is sooner. Reclassification may alter the criteria used to set the deemed values.

Other Management Measures

Submissions

- 15 **TOKM** agrees there is no need to include porae on the Third, 5A or Sixth Schedule. It strongly favours the inclusion of this species on the Fifth Schedule.
- 16 The **Northern Inshore Fishing Company Ltd** and **TOKM** support the inclusion of porae in the amateur daily bag limit for North Island recreational fishers.

MFish Discussion

- 17 MFish does not agree with TOKM's proposal to include all new species introduced into the QMS on the Fifth Schedule of the Act. The MFish response to this proposal is discussed in the introductory section to this document.
- 18 The submissions support the inclusion of porae as part of the combined 20 finfish daily bag limit for the North Island. No submissions were received from the recreational sector on this matter. MFish considers it appropriate to impose a catch limit on the recreational harvest of porae, given the species' vulnerability to the effects of fishing and the likelihood that recreational catches will increase in the future. The proposed daily bag limit will assist to ensure that catches remain sustainable.

Conclusion

- 19 Two submissions were received on the proposed sustainability measures for porae to support QMS introduction on 1 October 2004. These submissions support the proposed TAC, TACC and allowances for each fishstock, the low knowledge deemed values and daily bag limit restrictions that will apply to North Island recreational fishers. MFish has made no changes to these proposals set out in the IPP. MFish recommends an adjustment to the proposed deemed values to reflect the most recent port price information.
- 20 MFish considers the proposed TACs and supporting measures provide an appropriate balance in allowing fishers to continue to utilise porae at recent catch levels, while ensuring sustainability. The need for any additional management measures will be revisited when explicit sustainability or utilisation issues are identified.

Final Recommendations

- 21 MFish recommends that you:
- a) **Agree** to set a TAC of 75 tonnes for POR 1, and within this set:
 - i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 6 tonnes;
 - iii) An allowance of 4 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 62 tonnes.
 - b) **Agree** to set a TAC of 9 tonnes for POR 2, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1 tonne for other sources of fishing-related mortality; and
 - iv) A TACC of 6 tonnes.
 - c) **Agree** to set a TAC of 5 tonnes for POR 3, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1 tonne for other sources of fishing-related mortality; and
 - iv) A TACC of 2 tonnes.
 - d) **Agree** to set a TAC of 4 tonnes for POR 10, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1 tonne for other sources of fishing-related mortality; and

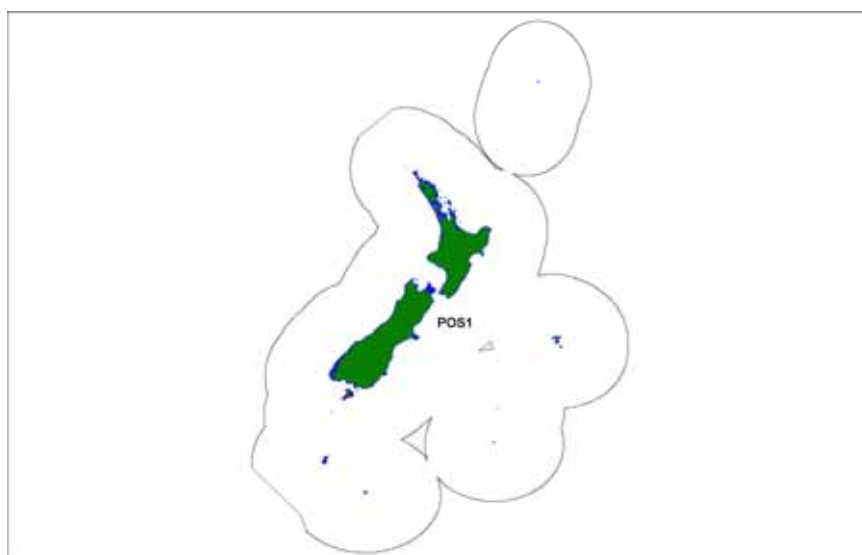
- iv) A TACC of 1 tonne.
- e) **Agree** to include porae as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986.
- f) **Agree** to include porae as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.
- g) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for porae to be used by commercial fishers when completing their statutory catch returns.
- h) **Agree** to set interim and annual deemed values for the 2004-05 fishing year as follows:
 - i) POR 1 – an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg;
 - ii) POR 2 - an interim deemed value of 0.35 per kg and an annual deemed value of \$0.69 per kg;
 - iii) POR 3 - an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg; and
 - iv) POR 10 - an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg.

PORBEAGLE SHARK (POS) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Porbeagle shark (*Lamna nasus*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Area (QMA) for porbeagle shark is outlined in Figure 1. The fishing year for porbeagle shark will be from 1 October through to 30 September in the following year, and the total allowable commercial catch (TACC) and annual catch entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: Quota Management Area for porbeagle shark



Key issues to be considered

- 2 Porbeagle shark is a highly migratory species. The degree to which populations of porbeagle shark are resident within New Zealand fisheries waters is unknown.
- 3 Porbeagle shark is an unavoidable bycatch in tuna longline fisheries, trawl and bottom longline fisheries. There are no target fisheries for porbeagle shark in New Zealand, but the choice of fishing gear can influence the retention of sharks once caught (the use of steel traces).
- 4 MSY cannot be estimated for porbeagle shark, as the fish found in New Zealand are only part of a wide-ranging stock.
- 5 There have been no assessments of the potential yield of porbeagle shark in New Zealand and information is not available to undertake such assessment.
- 6 Internationally, there is concern about increasing catches of sharks and the potential adverse effects on shark populations. The Food and Agriculture Organisation of the United Nations has coordinated the development of an International Plan of Action for

Conservation and Management of Sharks (IPOA-Sharks) within the framework of the Code of Conduct for Responsible Fisheries.

- 7 Porbeagle shark has been listed on the IUCN 2000 Red List as a low risk Near Threatened¹ species in the South-eastern Pacific.
- 8 Porbeagle shark is highly valued by southern recreational fishers as a significant big game sports fish.

List of Management Options

- 9 It is proposed to include porbeagle shark on the Third Schedule of the 1996 Act, as a species for which it is not possible to estimate MSY because of the biological characteristics of the species.
- 10 It is proposed to set a TAC pursuant to s 14 of the 1996 Act as MFish considers that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2).
- 11 The MFish proposal for the porbeagle shark (POS 1) TAC, other allowances and TACC (in tonnes) is outlined in Table 1.

Table 1: Proposed TAC, TACC, and allowances for porbeagle shark (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
POS 1	288	2	10	26	250

- 12 MFish also proposes the following additional management controls:
 - a) Inclusion of porbeagle shark as a sixth schedule stock that may be returned to the sea or other waters in accordance with stated requirements;
 - b) A review of the conversion factor for porbeagle shark;
 - c) Consequential amendments to the reporting regulations; and
 - d) Setting a deemed value for porbeagle shark (\$0.15) but no overfishing threshold.

TACs

TAC management strategy

- 13 Section 14 of the 1996 Act provides an exception to setting a TAC based on an assessment of MSY where the Minister is satisfied that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2). It is not possible to estimate MSY for the part of the porbeagle shark stock that is found within New Zealand fisheries waters.

¹ A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

- 14 It is proposed that TACs for porbeagle shark are set pursuant to s 14 of the 1996 Act. While any TAC must be set in a way that ensures use of the stock is sustainable there is no requirement to take into account or be guided by the need to manage in accordance with MSY. A TAC set under s 14 of the Act must be set in a way that better achieves the purpose of the 1996 Act. MFish believes that a TAC set under the provisions of s 14 of the 1996 Act can better provide for utilisation (developing fisheries to enable people to provide for their social, economic and cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters while ensuring sustainability.
- 15 Further, s 14 provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

Rationale for Proposed TAC

- 16 There have been no assessments of the potential yield of porbeagle sharks in New Zealand and information is not available to undertake such assessment. The information available to assess the sustainability of the porbeagle shark stock is limited to information on the biological and reproductive characteristics of the species and to catch information.
- 17 Porbeagle shark is a highly migratory species of oceanic habit whose stock status is not known.
- 18 Within New Zealand, porbeagle shark is an unavoidable bycatch, principally of mid-water trawl and tuna longline fisheries. In recent times there has been indications of targeting oceanic sharks for the shark fin trade.
- 19 In the absence of estimates of sustainable catch a TAC based on estimates of current utilisation is proposed. This is problematic because of the reporting problems associated with the fishery. MFish has used the best available information on which to base estimates of commercial catch and applied a correction factor to account for known potential errors. An average of the reported landings for the last three complete fishing years (corrected upwards by 25%) is the basis for an estimate of current commercial utilisation (250 tonnes). Non-commercial use and other sources of fishing mortality (38 tonnes combined) are assessed in order to determine a total estimate of current utilisation. MFish considers that a TAC at this level is likely to be sustainable.
- 20 A further consideration has been whether there is further development potential in the fishery for porbeagle shark. Current policy guidelines suggest that such potential should be assessed against the following factors:
- 21 **Sustainability of the stock,** Within the effort put into the target fisheries of which porbeagle shark is a bycatch, in comparison to the total international effort put into those fisheries, the New Zealand take of sharks is unlikely to be significant.
- 22 Compared with a wide range of shark species, the productivity of porbeagle shark is low to moderate. Its relatively fast growth results in a moderate age at maturity, however, the low fecundity is cause for strong concern as the ability of the stock to replace sharks removed by fishing is very limited. While it is currently unlikely that a target fishery will develop, the response of this species to target fishing indicates a need for cautious, assessment-based management of porbeagle shark. This is

compounded by observer information which suggests that the majority of porbeagle shark caught in New Zealand is dominated by immature sharks of both sexes.

- 23 Porbeagle shark has proven to be vulnerable to overfishing in the North-west Atlantic: a target longline fishery in the 1960s lasted only six years before collapsing. This fishery was revived by Canadian and United States vessels in the 1990s, but catch levels during the last decade appear to be unsustainable. This demonstrates a need for cautious management of porbeagle shark.
- 24 Commercial catch reporting of porbeagle shark is considered inconsistent at best, while conversion factors may be inaccurate by as much as 100%. Consequently, little can be inferred from landing data, except that commercial catch and landings data in New Zealand probably greatly underestimate actual catches of porbeagle shark, mainly through non-reporting of discarded sharks and reporting of processed weight by tuna longline vessels which often keep only the fins.
- 25 In their s 18 IPP submission, the Northern Inshore Fisheries Company Ltd (NIFC) notes that the under-utilisation of sharks is a reflection of the costs and difficulty associated with managing the shark flesh and the absence of a market for shark flesh, which makes porbeagle shark a low value bycatch. They believe it is unlikely that shark target fisheries will develop in New Zealand.
- 26 New Zealand has obligations under international agreements, especially the Food and Agriculture Organisation of the United Nations International Plan of Action for Conservation and Management of Sharks (IPOA-Sharks) within the framework of the Code of Conduct for Responsible Fisheries. The objective of the IPOA is to ensure the conservation and management of sharks and their long-term sustainable use. Guiding principles for the Plan of Action are that states that contribute to fishing mortality on a species should participate in its management, the precautionary approach should be applied to ensure sustainable management, and that management objectives and strategies should recognise the nutritional and socio-economic aspects of shark fisheries.
- 27 The IPOA-Sharks is voluntary, but proposes that states should develop a national plan of action for the conservation and management of shark stocks if their vessels catch sharks in targeted or non-targeted fisheries. MFish is to engage in the development of a National Plan of Action for sharks (NPOA) that will help provide a coordinated response to shark management issues in New Zealand fisheries waters.
- 28 Porbeagle shark has been listed on the IUCN 2000 Red List as a low risk Near Threatened species in the South-eastern Pacific.
- 29 While there is a general obligation to conserve and manage, there are no specific international obligations with regard to porbeagle shark that require catch controls at this stage, although in the future it is possible that the Western and Central Pacific Fisheries Commission will adopt measures for this species.
- 30 Any overfishing of porbeagle shark, it being an apex predator, could result in changes to predator/prey relationships and community structure. Understanding of food web relationships is still at an early stage, but MFish considers that, if evidence emerges of impacts on biodiversity from harvesting of porbeagle shark, this can be managed at that time based on international cooperation where appropriate.

- 31 It would be a concern if porbeagle shark were to become a target fishery, hence, it is not anticipated that there is much room for development from that of an inevitable bycatch fishery. However, it is noted that sustainability measures applied to this species have the potential to constrain the tuna longline fisheries and trawl fisheries.
- 32 **Biology of the stock and potential for local depletion**, for porbeagle shark this risk is considered to be moderate
- 33 It is unlikely that New Zealand catches of porbeagle shark influence the global sustainability for porbeagle sharks significantly. However, this does not preclude the possibility of local depletion issues
- 34 **Impacts of fishing on the aquatic environment including bycatch**, for porbeagle shark this is a factor of moderate risk. Porbeagle shark is taken in conjunction with other large tuna species including southern bluefin tuna and any increase in catch creates some risk that southern bluefin tuna may be caught over and above the catch limit set for this species. There is greater potential for the level of the TAC for porbeagle shark to constrain the fishery for target tuna species. This is mitigated to a degree by the measure providing for the release of live porbeagle sharks likely to survive. There is an unquantified risk to the viability of associated and dependent species, which is method, rather than species dependent.
- 35 **Socio economic and cultural issues**, there are clear benefits to the fishery if an expansion in catch can be realised and sustained. Revenue from the fishery will be increased and there will be an economic benefit to the nation as a whole.
- 36 **Anecdotal information on abundance and size of likely habitat in the management area**, for porbeagle shark the extent of the habitat within New Zealand fisheries waters is unknown. Anecdote focuses on the vulnerability of shark species to overfishing.
- 37 On balance the risks associated with an increase in catch of porbeagle shark are considered to be high. MFish therefore proposes to set a TAC for porbeagle shark based on a best estimate of current utilisation.

POS 1

- 38 MFish proposes a TAC for POS 1 of 288 tonnes.

Allocation of TAC

Recreational Allowance

- 39 MFish National Marine Recreational Fishing Surveys provide no quantitative estimates of the recreational catch of porbeagle shark, however, porbeagle shark is a known target species of southern recreational fishers.
- 40 Porbeagle shark appears to be an important component of the Wairarapa coast and southern big game recreational fishery. Porbeagle shark is a more important big game target than mako sharks in the Otago region where a number of national line/weight class records are held. Many porbeagle sharks are tagged and released but to date no

tag returns are recorded. Porbeagle sharks will also be caught by fishers not belonging to one of the big game fishing clubs.

- 41 MFish proposes that the Minister set an allowance for recreational fishers, as outlined in the Statutory Obligations and Policy Guidelines section. There are no estimates of recreational catch but, based on MFish's general understanding of the likely level of fishing activity of the recreational porbeagle shark fishery, MFish proposes a nominal 10 tonnes recreational allowance for POS 1.
- 42 When considering the allowance for recreational interests in the porbeagle shark fishstock, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made under s 311 of the 1996 Act. No such regulations have been made, and accordingly no adjustment to the proposed allowance needs to be considered on this basis.

Customary Māori Allowance

- 43 There is no indication of the importance of porbeagle shark to customary Māori fisheries, however, shark in general are known to be important and within that category there must be a take of porbeagle shark. MFish does not consider that it is likely that the level of customary take is the same as the recreational take. Porbeagle shark is less abundant than other shark species and less common in near shore waters. Therefore, an allowance set at 20% of the recreational catch (2 tonnes) is proposed.

Allowance for other sources of mortality

- 44 There is no information on the current level of illegal catch of porbeagle shark. It is suggested that no allowance is made to cover illegal catch at this time.
- 45 Based on Observer information, NIWA estimates that a quarter of porbeagle shark caught by tuna longliners are discarded. MFish considers that the same incentives will apply to fisheries where porbeagle shark is caught as an inevitable bycatch, a similar proportion is discarded in these fisheries. It is not known what proportion of these discards is unreported. It is also not unreasonable to assume a mortality associated with the tag and release programme undertaken by the big game sport fishing clubs.
- 46 On the other hand, management of porbeagle shark under the QMS is likely to promote more efficient use and better information from reporting, while providing for the release of live porbeagle shark will also reduce unnecessary mortality. MFish considers it prudent at this stage of the development of the fishery to set an allowance for other sources of mortality at 10% of the TACC and other allowances to account of fish lost before they are landed and fish returned to the water that subsequently die.

TACC

- 47 Reported landings of porbeagle shark have increased significantly over the last ten years, however, it is generally considered that this increase represents more an improvement in reporting rather than an increase in catch. Despite the improved reporting, the reported landings of porbeagle shark almost certainly under estimate catches, largely due to unrecorded discards and probable inaccuracies in the conversion factor.

- 48 Based on information from international fisheries and data supplied by NIWA, MFish considers that the conversion factor used for porbeagle shark, being 30, to be underestimating actual catch. MFish proposes a review of the conversion factors for porbeagle shark
- 49 A further difficulty with recorded landings has been the past use of generic codes including *other sharks and dogs* (OSD), and *sharks* (SHA). In order to account for these, and other, sources of error in reported landings MFish proposes to adjust these upwards by 25%.
- 50 MFish notes the development component of the fishery associated with tuna longlining, but also notes the reports of declining local catches from recreational fishers, the biological vulnerability of the species and New Zealand's international obligations and responsibilities. Use of the Sixth Schedule of the 1996 Act is an option that would allow the sustainability of porbeagle shark to be addressed, while ensuring that bycatch does not constrain target fisheries. Species included on the Sixth Schedule of the Act may be returned to the water subject to conditions that ensure that they are likely to survive release.
- 51 On this basis MFish considers that the TACC estimate be based on the average of the recorded landings of the last three completed fishing years with an increment of 25% to accommodate historical reporting anomalies.
- 52 MFish proposes a TACC of 288 tonnes.

Other Management Measures

- 53 Specific measures are proposed in respect of:
- Providing for inclusion of porbeagle shark on the Third Schedule as a species for which it is not possible to estimate MSY;
 - Allowing the return of live porbeagle shark to the water;
 - Reviewing the conversion factors for porbeagle shark;
 - Making consequential amendment to the fisheries reporting regulations; and
 - Setting a deemed value for porbeagle shark.

Inclusion of porbeagle shark on the Third Schedule

- 54 MFish proposes that porbeagle shark be added to the Third Schedule of the 1996 Act.
- 55 Porbeagle shark is a highly migratory species and NIWA report that porbeagle shark caught in New Zealand waters are part of a stock that includes the entire South Pacific. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. One of the criteria for inclusion of a stock on the Third Schedule is therefore satisfied.
- 56 Section 14 of the Act requires that species managed under s 14 be listed on the Third Schedule of the 1996 Act by Order in Council. Section 14 of the 1996 Act provides for the setting of an alternative TAC if the purpose of the Act is better achieved than by setting a TAC pursuant to s 13(2).

Return of porbeagle shark to the water

- 57 MFish proposes that porbeagle shark be added to the Sixth Schedule of the 1996 Act to allow their return to the water, with stated requirements that they must be likely to survive and must be returned to the waters from which they were taken as soon as practicable.
- 58 Adding porbeagle shark to the Sixth Schedule will provide fishers that catch porbeagle shark as a bycatch with the flexibility to legally return these fish to the sea. MFish considers this an advantage as large porbeagle shark may endanger fishers, while smaller sharks are of no or little value, but their take would impact upon the sustainability of the species. Details of this proposal are set out in Annex One at the end of this section.

Review the conversion factors for porbeagle shark

- 59 As outlined in the section explaining the rationale for TACC setting, MFish considers that the current conversion factors applying to porbeagle shark may not be correct. Therefore, MFish proposes that a review be undertaken of the conversion factors for porbeagle shark as part of a review planned for a range of species planned for 2004.

Consequential amendment to regulations

- 60 As a consequence of the introduction of porbeagle shark into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in the generic section of this document.

Deemed values and overfishing thresholds

- 61 A separate section in this document sets out generic information on the setting of interim and annual deemed values and overfishing thresholds proposed for porbeagle shark.
- 62 MFish considers that with low information and poor reporting for porbeagle shark, it is appropriate to include the species within the low knowledge fishstock category, to encourage the reporting of all catches of porbeagle shark. Accordingly it is proposed to use the 60% of port price level. There is no information concerning porbeagle shark that would necessitate a deterrent deemed value.
- 63 A port price for porbeagle shark has not been determined, therefore MFish proposes to use a nominal port price of \$0.25 per kg. An annual deemed value for porbeagle shark of \$0.15 per kg is proposed.
- 64 Consistent with the policy framework for deemed values and overfishing thresholds as it applies to low knowledge fishstocks, MFish does not propose to set differential deemed values or overfishing thresholds for porbeagle shark, unless monitoring of catch against the TACC suggest that this is required in the future.

Schedule 5A

- 65 MFish proposes that a carry forward of 10% of ACE be allowed for porbeagle shark on the basis that this will not unreasonably increase the sustainability risk to the stock,

and will allow flexibility for fishers to manage their fishing operations. It is therefore not proposed to list porbeagle shark on Schedule 5A of the 1996 Act.

Statutory Considerations

66 In forming the management options the following statutory considerations have been taken into account:

- a) The management options seek to ensure sustainability of the stock as required under s 8 by setting a TAC and other appropriate measures. Enhanced reporting will significantly improve understanding of the fishery and use of the Sixth Schedule will reduce unnecessary waste within the fishery. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers.

While porbeagle shark is an inevitable bycatch of the tuna longline fishery and setting a TACC for porbeagle shark could possibly act to constrain the target tuna fishery, MFish considers that this prospect can be mitigated by the inclusion of porbeagle shark into the Sixth Schedule whereby porbeagle shark can be returned to the sea;

- b) There is little known about the natural variability of porbeagle shark. Porbeagle shark prefer temperate and sub-antarctic waters so local changes in sea temperature may affect the local availability of this species;
- c) As mentioned, porbeagle shark is a bycatch of fisheries that target their prey species such as other sharks and pelagic fishes and squid, or, a bycatch of fisheries that target other species that predate on the same species, such as tuna. There is no evidence that these interactions are of significant magnitude to impact on associated and dependent species, or on biological diversity;
- d) Being a pelagic oceanic species and an inevitable bycatch fishery, it is considered unlikely any potential impact to habitats of particular significance to fisheries management would be attributed to the bycatch of porbeagle shark;
- e) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options for porbeagle shark;
- f) For porbeagle shark there is in place a bag limit for recreational fishers in FMAs 3, 5 and 6. MFish does not anticipate any change at this time;
- g) No fisheries plan exists or is proposed for POS 1;
- h) As porbeagle shark is solely a bycatch fishery, relevant conservation services or fisheries services are covered by the target fisheries. Therefore, relevant conservation services or fisheries services have not been considered in this paper. No decision has been made not to require a service in this fishery;
- i) There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for POS 1;

- j) Similarly, before setting any sustainability measure relevant to the Hauraki Gulf, the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000. This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. MFish considers that setting of sustainability measure for porbeagle shark will better meet the purpose of the Act, and ensure that the range of values associated with use of porbeagle shark resource are enhanced for the people and communities in the area;
- k) The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaimai exist in POS 1, the values of the mātaimai will not be compromised as porbeagle shark are an oceanic stock. No area has been closed or fishing method restricted for customary fishing purposes in POS 1 that would affect the fishery. No restrictions have been placed on fishing in any area within POS 1 for recreational interests; and
- l) Information sources used in this document include the NIWA report on biology and distribution of porbeagle shark, MFish held catch, effort and landings data. All sources indicate a lack of detailed information about aspects of the porbeagle shark fishery, however, the absence of information is not a reason for failing to provide for utilisation at levels considered to be sustainable.

Preliminary Recommendations

67 MFish recommends that the Minister:

- a) **Agrees** that the purpose of the 1996 Act is better achieved by setting a TAC for porbeagle shark otherwise than in accordance with s 13(2).
- b) **Agrees** to add porbeagle shark to the Third Schedule and set a TAC pursuant to s14 of the 1996 Act.
- c) **Agrees** to set a TAC of 288 tonnes for POS 1 and within that TAC set:
 - i) A customary allowance of 2 tonne;
 - ii) A recreational allowance of 10 tonne;
 - iii) An allowance for other fishing-related mortality of 26 tonne; and
 - iv) A TACC of 250 tonnes.
- d) **Agrees** to add porbeagle shark to the Sixth Schedule of the 1996 Act.
- e) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the code to be used by fishers when completing their statutory catch returns.
- f) **Agrees** to set deemed values for the porbeagle shark stock at \$0.15 per kg.
- g) **Notes** that a carry forward of 10% of ACE is proposed for the porbeagle shark stock.
- h) **Notes** that a review is proposed of the conversion factors for porbeagle shark.

ANNEX ONE

Amendment to regulations

Return of porbeagle shark to the water

- 68 Porbeagle shark frequently survive capture depending on the time hooked or the length of tow.
- 69 MFish proposes to provide for the return of porbeagle shark to the sea by adding porbeagle shark to the Sixth Schedule of the 1996 Act, with the following conditions:
- 70 That they are:
- a) Likely to survive;
 - b) Returned to the same waters from which they were taken; and
 - c) Are returned as soon as practicable after they are taken.

Problem definition

- 71 Porbeagle shark is caught as a bycatch and not a target species, which means there is little economic value associated with their take but there is a cost imposed by the requirement to obtain ACE and on the sustainability of the species. Further, smaller shark are of little or no value, while landing and handling larger porbeagle shark can be very dangerous.

Preliminary consultation

- 72 The desirability of the option not to have to handle large porbeagle shark was identified in s.18 IPP submissions by Vela Fisheries Ltd.
- 73 The desirability of including porbeagle shark on the Sixth Schedule is supported by the New Zealand Big Game Fishing Council.

Options

Non-Regulatory Measures

- 74 Unless porbeagle shark are added to the Sixth Schedule, it will be illegal to return or release porbeagle shark that are dangerous or of no economic value because of their size to the sea. There is no non-regulatory mechanism for returning fish taken under the QMS to the sea.

Regulatory Measures

- 75 To implement this measure it is necessary to add porbeagle shark to the Sixth Schedule of the 1996 Act.

Costs and benefits of the proposal

- 76 Adding porbeagle shark to the Sixth Schedule will provide fishers that catch porbeagle shark as a bycatch with the flexibility to legally return these fish to the sea (provided they are returned alive, immediately). MFish considers this an advantage as large porbeagle shark may endanger fishers, while smaller sharks are of no or little value, but their take would impact upon the sustainability of the species. Allowing porbeagle shark to be returned to the sea is the least cost option for fishers and should encourage fishers to adopt fishing practices that assist the survival of porbeagle shark, especially since they will not be penalised by deemed value payments.
- 77 Because of the limited value, discarding porbeagle shark caught as a bycatch is considered a reasonably common practice. Allowing porbeagle shark to be returned to the sea will avoid additional compliance costs that would be needed to ensure that porbeagle shark were not returned to the sea illegally.

Administrative implications

- 78 There are no significant administrative implications.

ANNEX TWO

Species Information

Species Biology

- 79 The porbeagle shark (*Lamna nasus*) is a member of the family Lamnidae, which also includes mako, great white, and several other shark species. Lamnid sharks are typically large, powerful, active predators. The porbeagle shark is an oceanic pelagic species that prefers temperate to sub-antarctic waters, tending not to stray into waters above 19 °C.
- 80 Porbeagle shark live mainly in the latitudinal bands 30–50 °South and 30–70 °North. It occurs in the North Atlantic Ocean, and in a circumglobal band in the Southern Hemisphere. Porbeagle shark is absent from the North Pacific Ocean, where it is replaced by the closely related salmon shark, *Lamna ditropis*.
- 81 In the South Pacific Ocean, porbeagle shark is caught north of 30 °S only in winter – spring; in summer they are not found north of about 35 °S. The temperature range inhabited by porbeagle shark in the Southern Hemisphere is about 1–23 °C, with abundance declining above about 19 °C.
- 82 The stock structure of porbeagle shark in the Southern Hemisphere is unknown. There is no evidence to indicate whether the stock associated with New Zealand fisheries waters extends to the eastern South Pacific or Indian Ocean.
- 83 Porbeagle shark is live-bearer (aplacental viviparous) and the gestation period is about eight to nine months. In the North-west Atlantic, all females sampled in winter were pregnant, suggesting that there is no extended resting period between pregnancies, and that the female reproductive cycle lasts for one year.
- 84 Litter size is usually four embryos, but ranges from one to five. Mean litter size in the South-west Pacific is 3.75. If the reproductive cycle lasts one year, annual fecundity would be about 3.7 young per female. The length at birth is 58–67 cm fork length (FL) in the South-west Pacific.
- 85 Most female porbeagle sharks sampled in the South-west Pacific have been immature, making it difficult to estimate their length at maturity. The size of pregnant sharks suggests that females mature at around 165–180 cm FL. Off New Zealand, males mature at about 150 cm FL. Both sexes mature at substantially smaller lengths in the South-west Pacific than in the North-west Atlantic.
- 86 In the South-west Pacific, juveniles grow 16–20 cm per year for four to five years and reach 110–125 cm after three years, but the ages at maturity have not been determined.
- 87 In New Zealand, porbeagle shark recruits to commercial fisheries during their first year, and much of the commercial catch is immature.

Fisheries Characteristics

Commercial catch

88 Porbeagle shark is an unavoidable bycatch in trawl and longline fisheries. There are no target fisheries for porbeagle shark in New Zealand, but in the longline fisheries the choice of fishing gear can influence the retention of sharks once caught (the use of steel traces).

89 The commercial catch of porbeagle shark is presented in Table 1.

Table 1: Commercial landings and discards (tonnes) of porbeagle sharks reported by fishers (CELRs, CLRs, and TLCERs) and processors (LFRRs) by fishing year. Also shown are the estimated quantities of porbeagle caught by tuna longliners, based on scaled up scientific observer records; values in parentheses are for the foreign chartered fleet, plus one large domestic vessel, only because of insufficient observer coverage of the domestic fleet (Francis et al. 2001b). –, no data available.

Year	Reported by fishers			Total reported	Processed LFRR	Estimated catch by tuna longliners
	CELR and CLR Landed	Discarded	TLCER (processed wt)			
1989–90	–	–	–	–	5	–
1990–91	0	1	–	1	1	–
1991–92	0	0	–	0	1	–
1992–93	1	5	1	7	7	–
1993–94	3	7	3	13	13	–
1994–95	12	4	3	19	10	–
1995–96	18	7	1	26	23	–
1996–97	19	20	6	45	52	145
1997–98	127	78	7	212	162	146
1998–99	233	68	36	337	240	(145)
1999–00	147	68	14	229	174	(62)
2000–01	142	46	8	196	150	–
2001–02	101	60	5	166	–	–

Catch by region

Table 2: Percentage of porbeagle landings taken by FMA (CELR landed and CLR). 0, less than 0.5%; blank, no catch reported.

Year	NULL	POS 1	POS 2	POS 3	POS 4	POS 5	POS 6	POS 7	POS 8	POS 9	POS 10
1991–92			22			44		34			
1992–93		2	5	11		18	3	59	2		
1993–94		5	0	7	1	14	7	66			
1994–95		8	3	14		37	2	36	0		
1995–96	1	1	9	22	5	4	4	55			
1996–97		0	0	7	9	9	7	67	1		
1997–98	1	0	4	25	1	15	3	51		0	
1998–99	1	1	7	6	0	25	7	53		0	0
1999–00		1	0	19	2	16	17	45		0	
2000–01		5	2	12	4	21	24	30	2	0	0
2001–02		13	4	11	1	17	26	25	1	2	
Total	0	3	4	14	2	19	13	44	0	0	0

Catch by method

- 90 Over 97% of the estimated catch was taken by midwater trawl. Most catch was taken by the hoki fishery off north-west South Island and the southern blue whiting fishery around the Auckland Islands. Around two-thirds of the landings were taken during July–September

Recreational catch

- 91 There is a recreational catch of porbeagle shark which is highly prized as a game fish on the lower east coast of the north and south Islands. Significant numbers of porbeagle shark are reported landed or tagged by big game fishing clubs, and others will be caught by fishers not belonging to one of these clubs.

Customary catch

- 92 There is no indication of the importance of porbeagle shark to customary Māori fisheries, however, shark in general is known to be important and within that category there must be a take of porbeagle shark. Therefore, the catch level has been set at 20% of the recreational catch.

Regulatory Framework

- 93 There is no Minimum Legal Size limit for either commercial or amateur fishers, nor are there any area or method restrictions.
- 94 There is an amateur daily bag limit for porbeagle shark of one per person per day in FMAs 3, 5, and 6.

Fisheries Assessment

- 95 There have been no assessments of the potential yield of porbeagle shark nor have any biomass estimates been made.

Associated Fisheries

- 96 There is limited information available for porbeagle shark on the interdependence of stocks and any environmental conditions affecting the stock.
- 97 MFish notes that porbeagle shark is an apex predator and as such will fulfil a significant role within the food chain, however no information is available as to the implications of this function for the ecosystem and biodiversity.
- 98 Being solely a bycatch fishery, porbeagle shark is associated with fisheries that target species that are either prey of porbeagle shark, or species that also prey on the same species as porbeagle shark. Porbeagle shark is an active pelagic predator of other sharks and fishes, and to a lesser extent squid.

Environmental Issues

- 99 Being a bycatch fishery, any environmental effects associated with the porbeagle fishery are accommodated within the provisions that apply to the target fisheries.

Research

- 100 There has been directed fisheries research on fish bycatch in tuna longline fisheries including porbeagle shark in the past. Research support for the Gamefish tagging program continues and work is underway to assess the age and growth of porbeagle shark in New Zealand fisheries waters.

Social, Cultural, and Economic Factors

- 101 MFish is not aware of any information on particular social, economic, or cultural matters that could influence the setting of the TAC and TACC for porbeagle shark.

PORBEAGLE SHARK (POS) – FINAL ADVICE

Initial Proposal

- 1 It was proposed in the initial position paper (IPP) to set the following TAC, allowance for customary fishing interests, recreational interests and other sources of fishing-related mortality, and TACC for porbeagle shark (*Lamna nasus*) being introduced into the QMS on 1 October 2004 (refer Table 1).

Table 1: Proposed TAC, Allowances, and TACC for porbeagle shark (*Lamna nasus*) in tonnes

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
POS 1	288	2	10	26	250

- 2 This proposal was part of a package of measures regarding the introduction of porbeagle shark into the QMS. Other measures proposed for these stocks included:
 - a) Listing porbeagle shark on the Third Schedule of the 1996 Act, so that porbeagle shark can be managed with an alternative TAC;
 - b) Listing porbeagle shark on the Sixth Schedule to the 1996 Act, so that porbeagle shark may be returned to the sea in accordance with the stated conditions that they are:
 - iv) Likely to survive;
 - v) Returned to the same waters from which they are taken; and
 - vi) Are returned as soon as practical.
 - c) Reviewing conversion factors for porbeagle shark;
 - d) Amending the reporting regulations to ensure that the appropriate fishstock code for porbeagle shark is used under the QMS; and
 - e) Setting a deemed value, but no differential deemed value or overfishing threshold, for porbeagle shark.

Submissions

- 3 Ten submissions were received on the porbeagle shark proposals from the following submitters:
 - **P Clarke**
 - **D Glass**
 - **D McIntosh**
 - **New Zealand Big Game Fishing Council (NZBGFC)**
 - **Seafood Industry Council (SeaFIC)**
 - **Sanford Limited** (Sanford)
 - **Sealord Group Limited** (Sealord)
 - **Te Ohu Kai Moana (TOKM)**

- **Tolaga Bay East Cape Charters (TBECC)**
- **Te Rūnanga o Ōtākou**

4 The specific submissions on the proposals for porbeagle shark are summarised and addressed under the relevant headings below.

Biological and Fishery Information

Submissions

5 The submissions received did not raise any issues concerning the biological or fishery information for porbeagle shark provided in the IPP (refer para 79-98).

MFish Discussion

6 The IPP contains a discussion of biological and fishery information. Since the release of the IPP, NIWA has advised MFish of corrections to the commercial landing information provided to MFish for use in calculating the POS 1 TAC/TACC (refer Table 2). Commercial landing and discard information is now available for the most recent fishing year (2002-03). MFish considers that commercial data from the most recent fishing year should be taken into account when setting the TAC and TACC for POS 1.

Table 2: Commercial landings and discards (t) of porbeagle sharks reported by fishers (CELRs and CLRs) and processors (LFRRs) by fishing year.

Year	CELR and CLR		Total	LFRR
	Landed	Discarded	Reported	
1989-90	–	–	–	5
1990-91	0	1	1	1
1991-92	0	0	1	1
1992-93	1	5	7	7
1993-94	3	7	10	13
1994-95	12	4	16	10
1995-96	18	7	26	23
1996-97	19	20	39	52
1997-98	127	78	205	162
1998-99	233	68	301	240
1999-00	147	68	215	174
2000-01	142	46	188	150
2001-02	101	60	161	119
2002-03	110	42	152	113

Environmental Considerations

Submissions

- 7 No submissions were received on the environmental considerations relating to fishing for porbeagle shark outlined in the IPP.

MFish discussion

- 8 MFish confirms its view on the environmental considerations relating to fishing for porbeagle shark outline in the IPP at para 99.

TACs, Allowances and TACC setting considerations

Submissions

Recreational Allowance

- 9 Submitter **D. Glass** notes there is a significant disparity between the proposed recreational and customary allowances compared to the allowance proposed for 'other mortality' and the TACC. D Glass contends that the recreational and customary allowances for POS 1 are not adequately provided for.
- 10 **NZBGFC** state that their records show that the recreational catch of porbeagle shark has fluctuated over the last nine years, and note porbeagle shark is important to southern fishers. NZBGFC is concerned that the commercial bycatch of porbeagle shark is wasteful while also having a significant impact on the sustainability of this low reproducing species.

Customary Allowance

- 11 **Te Rūnanga o Ōtākou** notes that the Minister is required to develop policies to help recognise the use and management practices of takatā whenua in the exercise of customary non-commercial fishing rights. Te Rūnanga o Ōtākou requests that 25% of the TAC be provided as a non-commercial allowance, of which 80% should be provided as a customary allowance. Te Rūnanga o Ōtākou requests this allocation to avoid the risk of commercial and non-commercial users coming into conflict in the future. Such an allocation would provide an effective means for Kaitiaki Runaka to exercise their kaitiakitaka responsibility.

Other Sources of Fishing-Related Mortality Allowances

- 12 No submissions regarding the proposal to allow for other sources of fishing-related mortality on porbeagle shark were received.

TACCs

- 13 **Te Rūnanga o Ōtākou** requests that a precautionary approach be adopted when setting TACs and TACCs for species where there is no catch history.
- 14 **P Clarke** and **D. Glass** consider that the TACC's proposed for the shark species are unlikely to be sustainable based on information contained in the IPP.
- 15 **NZBGFC** considers that an expansion of porbeagle shark catch at this time is inappropriate and that better catch data are needed, perhaps through an Adaptive Management Plan, before introducing porbeagle shark into the QMS. NZBGFC also contends that it is not possible to manage a species under the QMS when there are no robust data on catch.
- 16 **TBECC** submit that surface longlining has decimated pelagic shark populations on the east coast of the north island. TBECC believes any uncertainty over the stock size should result in very low quotas until there is certainty that the stock size has increased and can stand a TAC increase.
- 17 **TOKM** does not support the proposal to set the initial TAC as the average of commercial landing during the past 3 years plus 50% because porbeagle shark cannot be targeted, and is caught by a range of fisheries and methods. In addition, TOKM considers that there is little evidence, other than anecdotal, that porbeagle shark numbers available in New Zealand waters are in any way under threat and that commercial landings are not showing a decline. Climatic conditions may account for a reduction in porbeagle shark numbers in areas. TOKM question the relevance of the low risk near threatened status of porbeagle shark in the South-east Pacific area.
- 18 TOKM agrees that conversion factors for porbeagle shark are seriously understated but that plucking correction factors 'from the air' to add a load to reported landings is not acceptable. TOKM therefore, wishes to see a review of conversion factors for porbeagle shark.
- 19 TOKM suggests that the TAC/TACC for porbeagle shark be set at the best annual commercial catch reported over the last five fishing years, plus a 100% allowance, and review this level after three years. TOKM agrees with the catch levels and allowances provided for recreational, customary, and other sources of mortality.
- 20 **SeaFIC**, **Sanford Limited** and **Sealord** have submitted that the POS 1 TACC be recalculated using Licensed Fish Receiver Return (LFRR) data as a starting point for estimating landings and corrected with the proposed new conversion factors and the estimate of the proportion of pelagic sharks recorded in the generic shark reporting codes. Once more accurate catch landing information becoming available the TACC should be reviewed using the low knowledge bycatch fishery framework.

MFish Discussion

TAC

- 21 MFish considers that it is not possible to estimate MSY for that part of the porbeagle shark stock found within New Zealand fisheries waters. In the absence of information to undertake an assessment of the potential local yield of porbeagle shark MFish considers that the TAC should be based on estimates of current utilisation as proposed in the IPP (refer

para 19). MFish has based estimates of utilisation on the best available information, including that contained in the submissions.

- 22 Revised estimates of utilisation result from a consideration of submissions which in turn has lead to a revision of the TAC proposed for porbeagle shark. The TAC proposed in the IPP was 288 tonnes. A TAC of 249 tonnes is now recommended.

Recreational Allowance

- 23 There is no quantitative information on recreational catch of porbeagle shark and it is only a highly prized game fish in the south. A nominal 10 tonnes recreational allowance was proposed in the IPP following consideration of MFish policy guidelines. MFish notes that the average season catch of NZBGFC affiliated clubs since the 1996-97 season is not supplied and no new quantitative information is available to suggest an alternative allowance. The IPP contains a discussion of matters relating to the setting of the recreational allowance (refer IPP para 39-42). MFish confirms its position that a recreational allowance of 10 tonnes is set for porbeagle shark.

Customary Allowance

- 24 Te Rūnanga o Ōtākou has requested that 25% of the porbeagle shark TAC be provided as a non-commercial allowance. MFish notes that currently the non-commercial catch of porbeagle shark is thought to be low. There is no evidence of any conflict between commercial and non-commercial fishers over porbeagle shark.
- 25 MFish is of the view that an arbitrary allocation of 25% of the TAC to non-commercial fishers would not be appropriate. The TAC proposed is based on an assessment of current use in the fishery. To then set an allowance of 25% of the TAC for non-commercial use would have a severe economic impact on the commercial fisheries that take porbeagle shark as a bycatch.
- 26 The IPP contains a discussion of matters relating to the setting of the customary allowances (refer IPP para 43). MFish confirms that its position on customary allowances remains as stated in the IPP and an allowance of 2 tonnes is recommended.

Other Sources of Fishing-Related Mortality Allowances

- 27 The IPP contains a discussion of matters relating to the setting of the allowances for other sources of fishing-related mortality (refer IPP para 44-46). MFish confirms that its position on allowances for fishing-related mortality remains as stated in the IPP and an allowance of 10% of the TACC is recommended. A revised TACC is proposed in this advice (refer below) which results in a small change to the allowance for other sources of fishing related mortality.

TACC

- 28 MFish agrees with submitters that estimating commercial catch of porbeagle shark is problematic. The IPP contains a discussion of matters relating to the setting of the TACC (refer IPP para 47-52). MFish agrees with the SeaFIC and supporting submissions that the POS 1 TACC should be based LFRR data adjusted for the proportion of landings only as shark fins and adjusted further for an estimate of the proportion of pelagic sharks recorded in the generic shark reporting codes. MFish also supports the proposal that the TAC is reviewed once more accurate catch landing information becomes available.
- 29 However, MFish notes the comments and information supplied by P Clarke, D. Glass, TBECC, and NZBGFC. These three submitters believe that there has been a dramatic decline in the porbeagle shark stock in recent years. MFish also notes that since 2000-01 MFish Compliance considers reporting to be significantly improved, and that effort across a range of fisheries has been reasonably consistent while over the last three fishing years there has been a decline in the commercial catch of porbeagle shark.
- 30 Given the indications of declining landings of POS 1 and the sustainability issues associated with the fact that the New Zealand fishery predominantly harvests immature porbeagle shark, MFish believes that an element of caution is needed when setting the TAC/TACC prior to the provision of better information anticipated from management under the QMS. Recent advice from NIWA supports this precautionary approach. MFish therefore, supports the industry request for a review of the TAC when better data is available, but does not support TOKM's request for basing the TACC on the best years catch of the past five fishing years for the TACC plus a 100% allowance.
- 31 Accordingly, MFish has recalculated the proposed TACC in the manner requested by SeaFIC and supporting submissions. The recalculated TACC is based on LFRR data from the most recent three fishing years. The proportion of these landings that were only shark fins has been corrected for the proposed conversion factor for the landed state FIN that is presently out for consultation (45 as opposed to the 30 currently in use), together with recorded discards is shown in Table 3. The percentage of the catch landed as finned was obtained from LFR data and in applying a new correction factor it was assumed that shark fins were landed in a wet state (a separate conversion factor is proposed for dried fins). MFish notes that with improved reporting the incidence of porbeagle shark being recorded under the generic reporting codes OSD and SHA is minimal during the past three fishing years.

Table 3: Fishing year catch of POS 1 based on LFRR and discard catch data with a correction for the proposed new conversion factor of 45 for the proportion of shark fin landings.

Fishing Year	LFRR (t)	60% of landings as fins corrected from a conversion factor of 30 to a conversion factor of 45	Discards (t)	Total (t)
2000-01	150	195	46	241
2001-02	119	155	60	215
2002-03	113	147	42	189
3 Year Average				215

- 32 MFish notes that the approach taken in the IPP was to increase average landings by an arbitrary percentage to take into account factors such as altered conversion factors and generic shark reporting codes. The alternative approach supported by SeaFIC is to calculate these amounts and this has been done. The correction factor applied in the IPP (50%) to scale up reported landings of porbeagle shark resulted in an overestimate of landings. The revised estimate of current use is 215 tonnes (35 tonnes less than the TACC proposed in the IPP), however, MFish considers that this is the best available estimate for the purpose of setting a TACC and recommends a TACC is set at this level.

Social, Cultural and Economic Factors

Submissions

- 33 **SeaFIC, TOKM, Sanford Ltd and Sealord** note that despite the measures MFish is proposing to aid the introduction of porbeagle shark into the QMS the TACC will be set substantially below actual current landings. They are concerned that TACC set below actual landings will impose significant costs on the fishing industry. These costs include:
- Deemed values penalties to cover catches beyond the TACC;
 - Lost opportunity cost within target fisheries constrained by the availability of annual catch entitlement (ACE) for bycatch shark species; and
 - Increased operational costs as fishers are forced to alter fishing practices to avoid catching shark bycatch.

MFish Discussion

- 34 MFish acknowledges that there will be costs to individual fishers that catch porbeagle shark as a bycatch of their fishing operations associated with the entry of this species in the QMS and with the TACC proposed. MFish has proposed specific measures to mitigate these costs as follows:
- Allowing the return of live porbeagle shark to the sea;
 - Setting of low deemed values;
 - Setting no differential deemed value or overfishing thresholds.
- 35 Further, MFish believes that the costs must be balanced against sustainability risks to that part of the porbeagle stock found in New Zealand fisheries waters. Current information, while limited, does not suggest that an unrestrained TACC is appropriate for this species.
- 36 MFish notes that the provisional catch history years for highly migratory target and bycatch species do not overlap. Therefore, many fishers may not have sufficient provisional catch history to cover their bycatch and there will be likely initial costs associated with acquiring quota or ACE. The majority of quota will initially be held by the Crown. MFish notes that Crown holdings of POS 1 quota will be sufficient to provide for the 20% allocation required for Maori.
- 37 The IPP contains information relating to social, cultural and economic factors (refer IPP para 112). MFish confirms that its position on social, cultural and economic factors remain as stated in the IPP.

Other Management Measures

Submissions

Third Schedule

- 38 **SeaFIC, TOKM, Sanford Limited and Sealord** support the inclusion of porbeagle shark on the Third Schedule but note that within season adjustments to the TAC will be impractical because of the difficulties of measuring in-season abundance.

Sixth Schedule

- 39 **SeaFIC, TOKM, Sanford Limited, Sealord and NZBGFC** support the proposal to put porbeagle shark on the Sixth schedule.

Review of Conversion Factors

- 40 **SeaFIC, TOKM, Sanford Limited, and Sealord** support the need to review conversion factors to ensure accurate estimates of landings, but consider the TACC should be set on the basis of current catch using the new conversion factor.

Deemed Value and Overfishing Threshold

- 41 **SeaFIC, TOKM, Sanford Limited, and Sealord Group Limited** agree with the proposals for porbeagle shark to set the annual deemed value at 60% of the port price and not setting an overfishing threshold.

Shark Finning

- 42 **TOKM, NZBGFC and TBECC** have submitted on the inappropriateness of shark finning and the need to provide incentives for fishers to fully utilise their shark bycatch or release it alive. They further submit that in line with international developments, New Zealand should prohibit shark finning.

MFish Discussion

- 43 MFish notes the support of industry for the package of additional management controls proposed in the IPP to assist the introduction of porbeagle shark into the QMS. Accordingly MFish recommends that porbeagle shark is added to the Sixth Schedules of the 1996 Act as proposed in the IPP. Specific conditions proposed for the Sixth Schedule listing are that porbeagle sharks are likely to survive and must be returned to the same waters from which they were taken as soon as practicable. A recommendation to include porbeagle shark on the Third Schedule of the Act is contained in separate advice.
- 44 Submissions support the proposal in the IPP to review the conversion factor for porbeagle shark. A detailed proposal has been released for further consultation.
- 45 Of the oceanic shark species found in New Zealand fisheries waters porbeagle shark is one of the more vulnerable to overfishing and is likely to have a more localised distribution. MFish is concerned to avoid an increase in the demand for porbeagle shark that would occur from providing for the development of target fisheries. However, it does not wish to impose unreasonable constraint on fishers particularly during a period of rationalisation of the tuna

longline fishery. Taking these matters into account MFish has proposed that the TACC be set on the basis of average catch.

- 46 Current catch should be sufficient to satisfy demand in the fishery for bycatch but added flexibility is provided by the Sixth Schedule provision allowing the release of live porbeagle sharks in the event the level of the TACC is constraining. In this environment MFish considers that deemed values for porbeagle shark should be on the lower end of the continuum between port price and the transaction costs involved in acquiring and or holding a quantum of ACE. This will also reduce the potential for deemed values to distort the market for ACE during the period of transition of porbeagle shark into the QMS.
- 47 For this reason, while MFish notes the support in submission for setting deemed values at 60% of the port price for porbeagle shark MFish proposes that deemed values are set at a lower level. A nominal deemed value of \$0.15/kg was suggested in the IPP. A port price of \$0.68/kg has now been determined for porbeagle shark. MFish acknowledges that the deemed value level should be linked more appropriately to the ACE value but this value is not known at this time. Therefore, MFish proposes to retain the deemed value proposed in the IPP (\$0.15/kg), which now represents 22% of the port price but is above the likely transaction and levy costs anticipated for this fishery.
- 48 MFish considers that the QMS will provide strong incentives to reduce the practise of landing only the fins of shark bycatch because individual fishers catch will be constrained by ACE holdings and there will be a financial incentive to maximise the return on the ACE held. Given fishers will attempt to maximise the returns from their catch, MFish anticipates an increase in landed products of porbeagle shark once it is introduced into the QMS on 1 October 2004. The porbeagle shark fishery will be monitored to determine whether this is the case.

Legal Obligations

- 49 The statutory considerations that must be taken into account when setting a TAC and allowances for porbeagle shark were identified in the IPP (refer to IPP para 66). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Conclusion

- 50 In the IPP, MFish proposed a TAC, allowances and TACC for the porbeagle shark stock (POS 1) to be introduced into the QMS on 1 October 2004 (refer Table 1) and provided a summary of the species biology, a characterisation of the fishery and an overview of the present regulatory framework. MSY cannot be estimated for porbeagle shark, as the fish found in New Zealand are only part of a wide-ranging stock. Consequently, MFish has proposed that porbeagle shark be included on the Third Schedule to the Act and proposes that the TAC is set pursuant to s 14 of the Act. Any TAC set under s 14 of the Act can be set at a level that is not based on MSY provided that the TAC better meets the purpose of the Act than a TAC set under section 13(2).
- 51 In the absence of estimates of sustainable catch it is proposed to base the POS 1 TAC, allowances and TACC on estimates of current utilisation. There was new information in submissions and from NIWA on commercial and recreational catch of porbeagle shark.

MFish has recalculated commercial catch using the new information in the manner requested by industry. The recalculation of commercial landings information takes account of the proportion of porbeagle shark landed only as shark fins. A proposed new conversion factor of 45 (increased from 30) is applied to these landings. MFish has established a new estimate of the average for the last three fishing years reported catch landed to LFRs, which is 215 tonnes.

- 52 MFish has considered the best available information on catches, habitat and biology of the stocks, and statutory considerations in proposing the POS 1 TAC, allowances and TACC. MFish believes the proposed TAC is consistent with s 14 because it better meet the purpose of the Act than a TAC set at MSY, and the TACC proposal is consistent with s 21 in that the matters to be taken into account when a TACC is set have been addressed. MFish also believes that the proposed TAC and TACC levels provide for utilisation of porbeagle shark while imposing measures to promote its sustainability (s 8).
- 53 Given the indications of declining POS 1 landings and the sustainability issues associated with the fact that the New Zealand fishery predominantly harvests immature porbeagle shark, MFish believes that an element of caution is needed when setting the TAC/TACC prior to the provision of better information anticipated from management under the QMS. Accordingly, MFish considers that the TACC should be based on the average of commercial catch of the past three fishing years, but supports the industry request for a review of the TACC when additional information is available.
- 54 MFish notes the support of industry for the package of additional management controls proposed in the IPP to assist the introduction of porbeagle shark into the QMS. Accordingly MFish recommends that the additional management controls proposed in the IPP be implemented when porbeagle shark is introduced into the QMS on 1 October 2004.
- 55 Concerns were raised in submissions about shark finning and most proposed that it be banned. MFish considers that the QMS provides strong incentives to reduce the practise of only landing the fins of shark bycatch because individual catch limits will apply and fishers will attempt to maximise their returns from their ACE holdings. MFish intends to monitor the practice of shark finning but anticipates a reduction once porbeagle shark is introduced into the QMS on 1 October 2004.

Recommendations

- 56 MFish recommends you:
- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for porbeagle shark otherwise than in accordance with s 13(2).
 - b) **Agree** to set a TAC for porbeagle shark pursuant to s 14 of the Act.
 - c) **Agree** to set a TAC of 249 tonnes for POS 1 and within that TAC set:
 - i) A customary allowance of 2 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 22 tonnes; and
 - iv) A TACC of 215 tonnes.

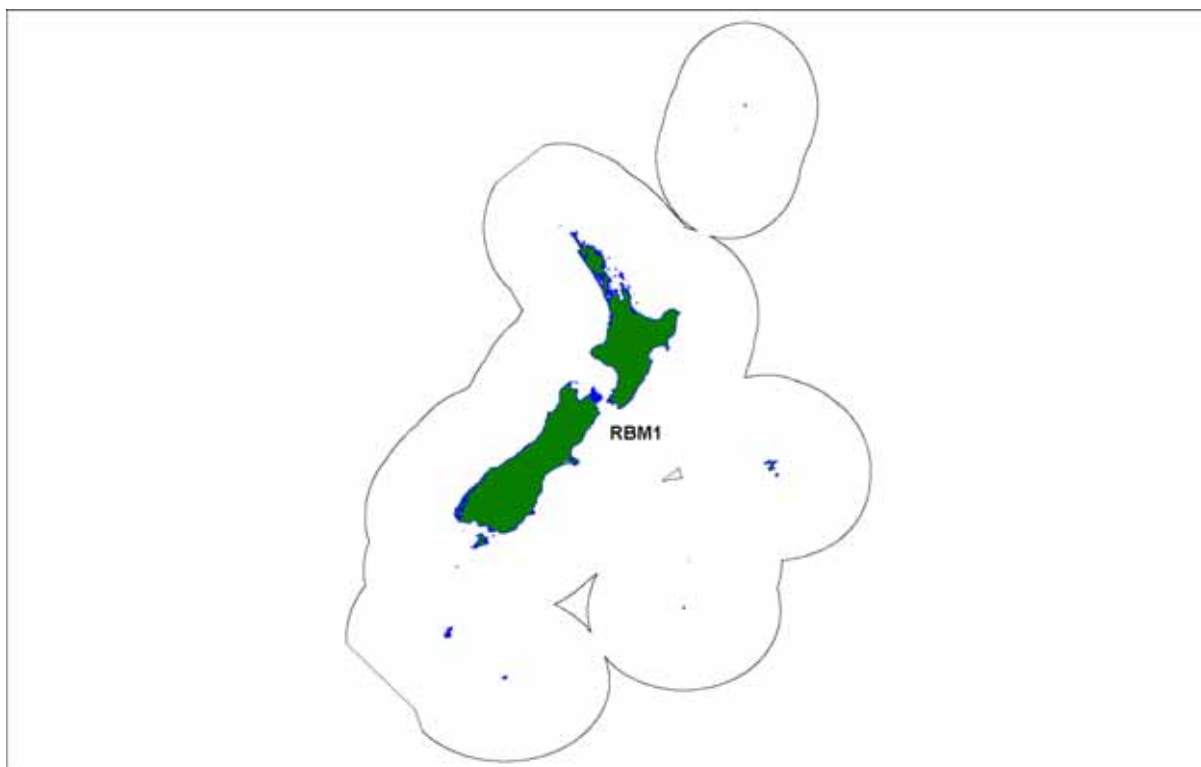
- d) **Agree** to add porbeagle shark to the Sixth Schedule of the Act subject to the conditions that they are:
 - vii) Likely to survive
 - viii) Returned to the same waters from which they are taken; and
 - ix) Are returned as soon as practical.
- e) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.
- f) **Agree** to set the deemed value for POS 1 at \$0.15/kilogram.
- g) **Note** that a review is proposed of the conversion factors for porbeagle shark.

RAY'S BREAM (RBM) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Ray's bream (*Brama brama*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Area (QMA) for Ray's bream is outlined in Figure 1. The fishing year for Ray's bream will be from 1 October through to 30 September in the following year, and Total Allowable Commercial Catch (TACC) and Annual Catch Entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: Quota Management Area for Ray's bream (RBM 1)



Key Issues to be Considered

- 2 Key issues relating to decisions on catch limits and other management controls for Ray's bream are:
 - a) Current understanding is that Ray's bream forms a single stock throughout the South Pacific Ocean;
 - b) Total catches in the South Pacific Ocean for the Ray's bream stock range up to 16 000 tonnes, the majority of it is taken across in the southeast Pacific area. New Zealand catches are small (averaging 640 tonnes annually), and this species is currently taken primarily as a bycatch in the midwater trawl fisheries for squid, hoki, and jack mackerels;
 - c) There are no known sustainability concerns with Ray's bream. Maximum sustainable yield (MSY) cannot be estimated, as the fish found in New Zealand are

- only part of a wide-ranging stock. There have been no assessments of the potential yield in New Zealand and information is not available to undertake such assessment;
- d) There is considered to be development potential for Ray's bream in New Zealand fisheries waters;
 - e) Setting low TACCs for Ray's bream is likely to either constrain the target fisheries or result in widespread discarding of Ray's bream; and
 - f) MFish considers that the purpose of the Act will be better achieved by setting a TAC for Ray's bream under s 14 of the 1996 Act.

List of Management Options

- 3 It is proposed to include Ray's bream on the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
- 4 MFish proposes the following catch limits for Ray's bream (refer Table 1).

Table 1: Proposed TAC, TACC, and allowances for Ray's bream (tonnes)

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
RBM 1	1 025	5	10	50	960

- 5 MFish also proposes to:
 - a) Amend the reporting regulations to ensure that the appropriate fishstock code for Ray's bream is used under the QMS; and
 - b) Set a deemed value for Ray's bream.

TACs

TAC management strategy

- 6 Section 14 of the 1996 Act provides an exception to setting a TAC based on an assessment of MSY where the Minister is satisfied that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2). While any TAC must be set in a way that ensures use of the stock is sustainable there is no requirement to take into account or be guided by the need to manage in accordance with MSY.
- 7 MFish believes that a TAC set under the provisions of s 14 of the 1996 Act can better provide for utilisation (developing fisheries to enable people to provide for their social, economic and cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters while ensuring their sustainability.
- 8 In the case of a stock for which MSY cannot be estimated, the criteria for inclusion of this stock on the Third Schedule of the 1996 Act are satisfied. The provisions of s 14(1) apply to stocks listed on this schedule.
- 9 It is not possible to estimate MSY for the part of the Ray's bream stock that is found within New Zealand fisheries waters. It is also likely that international catch limits will be set to

ensure the sustainability of the biological stock at some stage in the future. It is therefore proposed that Ray's bream are listed on the Third Schedule as a stock managed with an alternative TAC and a TAC is set pursuant to s 14 of the 1996 Act.

- 10 Further, s 14 provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

Rationale for Proposed TACs

- 11 There have been no assessments of the potential yield of Ray's bream in New Zealand and no information is available to undertake such assessment. The information available to assess the sustainability of the Ray's bream fishery is limited to information on the biological and reproductive characteristics of Ray's bream and catch information within New Zealand fisheries waters.
- 12 New Zealand is a party to a number of international agreements that have a bearing on highly migratory species management. Highly migratory species are defined in Annex I of 1982 United Nations Convention on the Law of the Sea as including pomfrets, one of which is Ray's bream (*Brama brama*). At present there are no specific international obligations that would require New Zealand to impose catch limits for Ray's bream.
- 13 In the absence of estimates of sustainable catch a TAC based on estimates of current utilisation is proposed. MFish has used the best available information on which to base estimates of commercial catch (the average of the last five years commercial catch is 640 tonnes), and has applied a correction factor to account for known potential errors. Non-commercial use is assessed and nominal allowances proposed in order to determine a level of TAC.
- 14 A further consideration has been whether there is further development potential in the fishery for Ray's bream. Current policy guidelines suggest that such potential should be assessed against the following factors:
- 15 **Sustainability of the stock**, for Ray's bream the risk is considered low. Total catches in the South Pacific Ocean for the Ray's bream stock range up to 16 000 tonnes, the majority of which is taken by Chile in the southeast Pacific area. The New Zealand contribution (averaging 640 tonnes annually) is low at 5-10% of the total catch of Ray's bream for the whole South Pacific stock.
- 16 Within New Zealand, Ray's bream is predominantly taken as a bycatch in the midwater trawl fisheries for squid, hoki and jack mackerels. There are no target fisheries for Ray's bream in New Zealand, but as it sometimes aggregates into schools it could be targeted.
- 17 Little is known about the growth rate, mortality rate, age at maturity, or longevity of Ray's bream in New Zealand. The best available information suggests that Ray's bream has high to moderate productivity, which implies that it should be resilient to fishing (refer Annex Two).
- 18 **Biology of the stock and potential for local depletion**, for Ray's bream the risk is considered low. The majority of Ray's bream taken in New Zealand may have reached maturity, however this information is based on specimens taken in the tuna longline fishery which is a minor component of the New Zealand fishery. There is no information on the size of trawl caught fish. There is only limited information about spawning of Ray's bream

in New Zealand and few ripe fish have been recorded. The New Zealand fishery appears to be based on adult fish that are likely to be free ranging.

- 19 **Impacts of fishing on the aquatic environment including bycatch**, for Ray's bream is considered to be a factor of low risk. Ray's bream is taken in conjunction with squid, hoki and jack mackerels and any increase in catch creates some low risk that the target species may be caught over and above the catch limit set for it. There is also an unquantified risk to the viability of associated and dependent species, which is method, rather than species dependent.
- 20 **Socio economic and cultural issues**, with Ray's bream there are clear benefits to the fishery if an expansion in catch can be realised and sustained. More fish is able to be taken in the fishery and there are economic benefits to both the fishery and to the nation. There is little sharing of the fishery with the recreational or customary sectors and potential conflicts between sectors are unlikely.
- 21 **Anecdotal information on abundance and size of likely habitat in the management area**, for Ray's bream the extent of the habitat within New Zealand fisheries waters is unknown. Anecdotal information suggests that the potential of the fishery has yet to be realised.
- 22 On balance the risks associated with an increase in catch of Ray's bream are considered to be low. MFish therefore proposes to set a TAC for Ray's bream based on a best estimate of current commercial utilisation plus a 50% increment and allowances. The size of the increase is dependent on the level of risk associated with the development of the fishery. MFish has not proposed any increase higher than a 50% increase on the average recent catch levels until more is known about the biology and distribution of Ray's bream in New Zealand fisheries waters and the potential interactions with other target and non-target species. However, MFish considers that the risks associated with the 50% increase proposed are manageable, and provide opportunity for the development of what is considered to be an under-utilised fishery. MFish proposes a TAC for Ray's bream of 1 025 tonnes.

Allocation of TAC

Recreational Allowance

- 23 As indicated in Annex Two, the National Marine Recreational Fishing surveys provide no quantitative estimates of recreational harvest of Ray's bream. Ray's bream is not highly prized as a game fish and the recreational catch probably consists mainly of incidental bycatch while targeting groper and other species.
- 24 MFish proposes that the Minister sets allowances for recreational fishers, as outlined in the Statutory Obligations and Policy Guidelines section. There are no estimates of recreational catch, but based on MFish's information on the likely level of fishing activity in the recreational line fishery, MFish proposes a nominal 10 tonne recreational allowance for Ray's bream.
- 25 When considering the allowance for recreational interests in the Ray's bream fishstock, the Minister is required to take into account any regulations made under s 311 of the 1996 Act

that prohibit or restrict fishing in any area. No such regulations have been made, and accordingly no adjustment to the proposed allowance needs to be considered.

Customary Māori Allowance

- 26 The levels of customary Māori harvest of Ray's bream are not known. MFish considers that customary fishers are likely to make less use of Ray's bream resources than recreational fishers. It is not known to be a species of particular importance to Māori and its offshore distribution make it less accessible to customary fishers.
- 27 Accordingly, MFish proposes to set the customary allowance at one-half of that provided to recreational fishing interests based on the criteria outlined in the Statutory Obligations and Policy Guidelines section. Thus, MFish proposes a 5 tonne customary Māori allowance for Ray's bream.
- 28 The Minister, in setting or varying a TACC, must allow for Māori customary non-commercial fishing interests in that stock. In considering Māori customary non-commercial interests, the Minister is required to take into account any mātaihai reserve in the relevant quota management area or any closure, fishing method restriction or prohibition imposed under s 186A. MFish does not consider that the proposed allowance will detract from the intent of any mātaihai reserve or s 186A area closure presently in place, nor will the allowance be likely to be insufficient in terms of customary use of Ray's bream in these areas.

Allowance for other sources of mortality

- 29 There is no information on the current level of illegal catch of Ray's bream. It is suggested that no allowance is made to cover illegal catch at this time.
- 30 There is some information from observed trawl and bottom longline fisheries on the amount of discarded catch of Ray's bream (refer Annex Two). Introduction of the species into the QMS should improve reporting.
- 31 In the absence of better information, given the methods used to take rays bream MFish recommends that the allowance for all other sources of fishing-related mortality be set at 5% of the proposed TACC to account for fish lost before they are landed via gear loss etc.
- 32 Based on this rationale, MFish proposes a 50 tonne allowance for other sources of fishing-related mortality for Ray's bream.

TACC

- 33 Over the past five completed fishing years, the nominal total weights of Ray's bream reported by fishers ranged from 476 to 1 016 tonnes, and has averaged around 640 tonnes. Licensed fish receiver returns indicate between 421 and 926 tonnes were processed for the same period. In recent years, New Zealand's contribution to the catch of Ray's breams in the South Pacific region is around only 5-10% of the total.
- 34 There are no known sustainability concerns with Ray's bream. MSY cannot be estimated, as the fish found in New Zealand are only part of a wide-ranging stock. There have been no assessments of the potential yield in New Zealand and information is not available to undertake such assessment.

- 35 MFish proposes that the TAC is based on average reported landings over the last five completed fishing years (1997-98 to 2001-02). As a consequence of the developmental opportunity identified above and some under-reporting of Ray's bream catches, MFish proposes to make an upward 50% adjustment to the average reported landings over the last five completed fishing years to provide a proposed TACC of 960 tonnes for Ray's bream.
- 36 Setting of the proposed TACC with this level of adjustment is likely to result in neither constraining the target fisheries or in widespread discarding of Ray's bream.

Other Management Measures

- 37 Specific measures are proposed in respect of:
- Providing for inclusion of Ray's bream on the Third Schedule as a species for which it is not possible to estimate MSY;
 - Making consequential amendment to the fisheries reporting regulations; and
 - Setting a deemed value for Ray's bream.

Inclusion of Ray's bream on the Third Schedule

- 38 MFish proposes that Ray's bream be added to the Third Schedule of the 1996 Act to allow the TAC for Ray's bream to be set pursuant to s 14. Section 14 of the 1996 Act provides an alternative TAC to be set for stocks specified in the Third Schedule where the Minister is satisfied that the purpose of the 1996 Act is better achieved by setting an alternative TAC.
- 39 Ray's bream is a highly migratory species and NIWA report that Ray's bream caught in New Zealand waters is part of a stock that includes the entire South Pacific. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. A criterion for the inclusion of Ray's bream on the Third Schedule is therefore satisfied.
- 40 An Order in Council listing Ray's bream on the Third Schedule would allow for the Minister to set a TAC for moonfish under s 14 should he determine that the purpose of the 1996 Act is better achieved by setting an alternative TAC.

Consequential amendment to regulations

- 41 As a consequence of the introduction of Ray's bream into the QMS, MFish recommends an amendment to the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this paper.

Deemed values and overfishing thresholds

- 42 A separate section in this document sets out generic information on the setting of interim and annual deemed values and overfishing thresholds.
- 43 MFish considers that as Ray's bream best fits the low knowledge fishstock category and as there are no known sustainability concerns it is appropriate to apply a factor of 60% of the port price level. There are no known sustainability concerns for Ray's bream that would

necessitate a deterrent deemed value. A port price of \$1.18 per kg has been determined for Ray's bream. An annual deemed value for Ray's bream of \$0.71 per kg is proposed.

- 44 Consistent with the policy framework for deemed values and overfishing thresholds as it applies to low knowledge fishstocks, MFish does not propose to set differential deemed values or overfishing thresholds for Ray's bream, unless monitoring of catch against the TACC suggest that this is required in the future.
- 45 MFish proposes that a carry forward of 10% of ACE be allowed for Ray's bream on the basis that this will not unreasonably increase the sustainability risk to the stock, and will allow flexibility for fishers to manage their fishing operations

Statutory Considerations

- 46 In forming the management options the following statutory considerations have been taken into account:
 - a) The management options seek to ensure sustainability of the stock as required under s 8 by setting a TAC and other appropriate measures. Enhanced reporting will significantly improve understanding of the fishery. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers. While Ray's bream is an inevitable bycatch of the midwater trawl fishery and setting a TACC for Ray's bream could possibly act to constrain the target fisheries, MFish considers that this prospect can be mitigated by the developmental opportunity of a proposed 50% increment in catch;
 - b) With a TACC set at the average of the last five years of commercial catch, and an increment of 50% to provide developmental opportunity and some under-reporting, MFish considers that there will not be a significant impact on social, economic and cultural factors;
 - c) There is little known about the natural variability of Ray's bream. As mentioned, Ray's bream is a bycatch of fisheries that target squid, hoki and jack mackerels but there is no evidence that these interactions are of significant magnitude to impact on associated and dependent species, or on biological diversity (s 11(1)(c));
 - d) Being a highly migratory species and an inevitable bycatch fishery, it is considered unlikely any potential impact on habitats of particular significance to fisheries management would be attributed to the bycatch of Ray's bream (s 9(c));
 - e) There is limited information available for Ray's bream on the interdependence of stocks and any environmental conditions affecting the stock. As Ray's bream is solely a bycatch fishery, the environmental impacts of fishing are best considered under the management provisions of the target species (s 9(a));
 - f) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options for Ray's bream (ss 5 and 8);
 - g) No fisheries plan exists or is proposed for Ray's bream. Ray's bream is taken solely as a bycatch. Relevant conservation services or fisheries services are covered by the target fisheries. Cost recovery levies are already charged for Ray's bream. Further,

there have been no decisions not to require conservation services or fisheries services (s 11(2A));

- h) There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for RBM 1 (ss 2 (a) and (b));
- i) Similarly, before setting any sustainability measure relevant to the Hauraki Gulf, the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000. This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. MFish considers that setting of sustainability measure for Ray's bream will better meet the purpose of the Act, and ensure that the range of values associated with use of the Ray's bream resource are enhanced for the people and communities in the area;
- j) The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaihai reserves exist within the fishery management area for Ray's bream (RBM 1) the values of mātaihai reserves will not be compromised, as Ray's bream is an oceanic stock. No area has been closed or fishing method restricted for customary fishing purposes in RBM 1 that would affect the fishery. No restrictions have been placed on fishing for Ray's bream within RBM 1 for recreational interests (s 21); and
- k) The information used to develop proposals for Ray's bream relies (in the absence of overseas assessments of the stock) on information from commercial catches, which is limited with respect to evaluating levels of sustainable harvest. Section 10(d) provides however, that uncertainty in information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act.

Preliminary Recommendations

47 MFish recommends that the Minister:

- a) **Agrees** that the purpose of the Act is better achieved by setting a TAC otherwise than in accordance with s 13(2).
- b) **Agrees** to add Ray's bream to the Third Schedule of the Act and set a TAC for Ray's bream pursuant to s 14 of the 1996 Act.
- c) **Agrees** to set a TAC of 1 025 tonnes for RBM 1 and within that TAC set:
 - i) A customary allowance of 5 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 50 tonnes; and
 - iv) A TACC of 960 tonnes.
- d) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.
- e) **Agrees** to set deemed values for the Ray's bream stock at \$0.71 per kg.
- f) **Notes** that a carry forward of 10% of ACE is proposed for the Ray's bream stock.

ANNEX ONE

Third Schedule - add Ray's bream to this schedule

- 48 Should the Minister agree that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13((2) of the 1996 Act, MFish proposes that Ray's bream be added to the Third Schedule of the 1996 Act to allow the TAC for Ray's bream to be set pursuant to s 14. Section 14 of the 1996 Act provides for the setting of alternative TACs if these better achieve the purpose of the 1996 Act.

Problem definition

- 49 Ray's bream is a highly migratory species and NIWA reports that Ray's bream caught in New Zealand waters is part of a stock that includes the entire South Pacific Ocean. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. Section 14 of the Act requires that species managed under s 14 be listed on the Third Schedule of the 1996 Act by Order in Council.

Preliminary consultation

- 50 No preliminary consultation has been undertaken concerning adding Ray's bream to the Third Schedule.

Options

Non-Regulatory Measures

- 51 There is no non-regulatory mechanism that allows establishing an alternative TAC for fish stocks.

Regulatory Measures

- 52 To implement this measure it is necessary to add Ray's bream to the Third Schedule of the 1996 Act.

Costs and benefits of the proposal

- 53 If Ray's bream is added to the Third Schedule a TAC will be able to be set that ensures use of the stock is sustainable and achieves the purposes of the 1996 Act, without having to manage in accordance with MSY. Having Ray's bream on the Third Schedule also allows for an in-season review in any year to take advantage of available yield beyond the target stock level.

Administrative implications

- 57 There are no significant administrative implications.

ANNEX TWO

Species Information

Species Biology

- 54 Ray's bream has a wide distribution, being found in the North Atlantic Ocean and throughout the subtropical to subantarctic waters of the Southern Hemisphere. It is apparently absent from the North Pacific Ocean, where it is replaced by Pacific pomfret, *Brama japonica*. *Brama* species (probably *B. brama* and *B. australis* combined) are distributed across the whole South Pacific between New Zealand and Chile, but are most abundant west of 110° W.
- 55 Southern Ray's bream is now known to be circum-antarctic in temperate waters between 36°S and 48°S, while bronze bream is known to occur from Southern Australia to Chile between 38°S and 55°S.
- 56 Ray's bream is a midwater fish, probably ranging from surface to near the bottom. The average size of Ray's bream is 40–50 cm, and it reaches about 60 cm.
- 57 Ray's bream is widely distributed within and beyond New Zealand's fisheries waters. It is likely that it is part of a single stock found throughout the South Pacific. There have been no biological studies that are directly relevant to the recognition of separate stocks around New Zealand.
- 58 Ray's bream around New Zealand is regularly caught as bycatch in midwater trawl fisheries for squid, hoki, and jack mackerels. They are regularly taken by tuna longlines wherever longline sets occur especially the west coast of the South Island, also in smaller amounts on the east coast of the North Island especially Bay of Plenty and East Cape, and the east coast of the South Island south of 45°S. It is the third most commonly caught species on tuna longlines, comprising about 13% of the catch by number. Ray's bream is caught by trawlers on the Chatham Rise, the west coast of the South Island between 41–43°S, Puysegur Bank, Stewart-Snares shelf, the Challenger Plateau, and off Wairarapa.
- 59 Juvenile Ray's bream has only been recorded south of 40°S, off Wairarapa, the west coast of the South Island, Southland and on the Chatham Rise.
- 60 Ray's bream has been observed aggregated into schools. Distribution may vary seasonally and over time, but no appropriate studies have been undertaken.

Reproduction

- 61 Little is known about spawning of Ray's bream in New Zealand. Gonad stages have been recorded during trawl surveys for a small number of fish and seven ripe fish have been observed in Southland, the west coast of the South Island, and on the Chatham Rise.
- 62 In the North Atlantic, Ray's bream spawn over a protracted period between spring and autumn. Spawning may occur at different times of year in different latitudes, with a preference for temperatures greater than 19.5°C. Juveniles less than 25 mm long are found

in surface waters at temperatures of 21–24°C. They appear to descend into deeper water as they grow.

- 63 In the North Pacific, Pacific pomfret spawn over a lengthy period in warm subtropical waters, and small juveniles exclusively occur there.

Age and growth

- 64 Little is known about the growth rate, mortality rate, age at maturity, or longevity of Ray's bream in New Zealand. Females mature at about 43 cm fork length.
- 65 The fishery for Ray's bream off north-west Africa mainly exploits two successive age groups, and progression of length-frequency modes suggests a fast growth rate of about 13 cm per year for fish 27–30 cm fork length. Fast initial growth is also likely for Portuguese fish, followed by a considerable reduction in growth rate; longevity is reported to be 12 years.
- 66 Pacific pomfret grow rapidly, though there are conflicting estimates of growth rate and longevity, with the latter being variously given as three, six or nine years. Nevertheless, it is clear that early growth is extremely rapid with fish reaching about 30 cm in their first year, and maturing during their second year.
- 67 By analogy with Ray's bream in the North Atlantic, and Pacific pomfret, it seems likely that New Zealand Ray's bream would have high growth and natural mortality rates, and low to moderate longevity. The best available information suggests that Ray's bream has high to moderate productivity, which implies that it should be resilient to fishing (pers. comm., Talbot Murray, NIWA).

Size frequencies

- 79 The length distribution for Ray's bream caught on tuna longlines shows a single prominent mode centred around 45–55 cm fork length with most fish in the 34–62 cm range. There is little information on size of Ray's bream caught by trawlers.

Fisheries Characteristics

Commercial catch

- 80 Ray's bream is a highly migratory species and has a wide distribution, being found throughout the subtropical to sub-antarctic waters across the whole South Pacific between New Zealand and Chile. The catch of Ray's bream, while fluctuating, appears to be stable within the New Zealand fisheries waters, and has averaged around 640 tonnes for the last five fishing years (refer Table 2). Over the past five fishing years, the nominal total weights of Ray's bream reported by fishers (including tuna longlining catch effort returns where the catch cannot be adjusted to whole weight) ranged from 476 to 1 016 tonnes (some years contain anomalously high reported landings for some FMAs). Licensed fish receiver returns indicate between 421 and 926 tonnes were processed for the same period.
- 81 The FAO reported catches¹ of Ray's bream in the South Pacific were very low in the 1980s and early 1990s, increased to about 6 000 tonnes from 1996-99, and then climbed to

¹ Food and Agriculture Organisation of the United Nations, Fishery Statistics: catches and landings

16 000 tonnes in 2001. Chile has taken the bulk of these catches from the southeast Pacific area. Catches within the New Zealand EEZ, therefore, comprise only 5-10% of the total catch for the South Pacific region.

Table 2: Total reported landings (tonnes) of Ray's bream by FMA between 1990-91 and 2001-02.

	Fishing Year											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
FMA 1	5	45	3	2	7	5	7	41	14	5	33	22
FMA 2	1	<1	<1	2	2	2	4	11	7	11	17	14
FMA 3	43	56	47	27	378	124	176	276	277	319	342	183
FMA 4	<1	3	26	35	43	29	60	64	49	40	59	49
FMA 5	191	213	311	32	88	518	66	123	115	57	108	157
FMA 6	<1	<1	14	35	7	63	53	2	4	14	20	95
FMA 7	4	26	4	30	18	20	30	137	33	30	426	37
FMA 8		<1	<1	<1	<1	<1	<1	<1	<1	<1	11	<1
FMA 9				<1	<1	<1	<1	<1	5	<1	<1	<1
FMA10			<1		<1					<1	<1	<1
Total	245	344	407	163	544	782	422	655	511	476	1016	558

Notes: Fishing year '1991' is the fishing year 1990-91. A total of 55 tonnes could not be allocated to FMAs over these 12 years

Catch by region

- 82 Most of the Ray's bream landings reported on CELR and CLR forms are taken in FMAs 3, 5 and 7, with significant quantities also coming from FMAs 4, 6 and 1 (refer Table 2).
- 83 The most important fishing statistical areas, based on CELR estimated catch and TCEPR records, were 28-30, 504, 602 and 619 (Sub-antarctic), 20-23 (east coast, South Island), 34-36 (west coast, South Island) and 407 and 408 (Chatham Rise).

Catch by method

- 84 Most (85%) Ray's bream is caught by midwater trawl (refer Table 3). Bottom trawling accounts for 14%, bottom longlining 1%, troll fishing 0.3% and surface longlining 0.1%. Ray's bream is caught by mid-water trawlers in all FMAs around the South Island, with the largest amounts being taken from Stewart-Snares shelf (FMA 5) followed by Chatham Rise (FMA 3). The major catches by bottom trawling have occurred on the Chatham Rise (FMA 3). Ray's bream is taken on surface tuna longlines on the east coast of the North Island, especially in the Bay of Plenty-East Cape (FMA 1), and on the east coast of the South Island (FMA 3 & 4). It is also taken by tuna trolling, especially on the west coast of the South Island (FMA 7).

Table 4: Estimated catch (tonnes) of Ray's bream by fishing method by FMA, cumulative total from fishing years 1990-91 to 2001-02.

Method	FMA1	FMA2	FMA3	FMA4	FMA5	FMA6	FMA7	FMA8	FMA9
Midwater trawl	<1	6	957	242	1,632	309	472	8	
Bottom trawl	9	6	457	14	59	14	13		<1
Bottom longline	15	4	8	12	<1	<1	<1	<1	<1
Troll	<1	<1	<1	<1	<1		10	<1	<1
Surface longline	<1	<1			3		2		<1
Other	<1	<1	<1	<1			<1		<1
Total	26	17	1423	268	1695	323	498	8	<1

Targeted catch and bycatch

85 Ray's bream is largely taken as a bycatch of targeting other commercial species around New Zealand (refer Table 3), only 0.2% of the cumulative catch was reported to be targeted catch. The most important target species in fisheries catching Ray's bream are as follows:

- midwater trawl mostly targeting squid (45%), hoki (30%), and jack mackerel (19%), also some southern blue whiting (3%) and barracouta (2%);
- bottom trawl for hoki (44%) and squid (43%), also some red cod (3%) and barracouta (3%);
- bottom longlining for ling (59%) and bluenose (34%);
- troll fishing for albacore (99%); and
- surface longlining for southern bluefin tuna (81%) and other tunas (13%)

Table 5: Estimated catches (tonnes) of Ray's bream by target species, for fishing years 1990–91 to 2001–02. After the targeted catches of Ray's bream, bycatches of Ray's bream are listed in order of cumulative size over this time period

Target	Fishing Year											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Ray's bream	<1	<1	<1	<1	6							<1
Squid	198	369	276	43	29	345	55	62	35	3	179	52
Hoki	<1	24	21	62	135	88	155	253	246	218	138	114
Jack mackerels	<1	7	6	21	150	142	60	31	10	13	323	10
Southern blue whiting	<1			<1					<1	<1	9	143
Barracouta	<1	14	5		5	24	9	11	17	3	10	11
Red cod	<1		11			<1	<1	<1	2	<1	9	6
Ling	2	7	4	<1	2	2	2	<1	2	3	<1	1
Bluenose	4	2	<1	<1	1	1	1	<1	<1	<1	<1	<1
Albacore	<1	5	<1	<1	<1	<1	<1	<1	<1	<1	2	2
Others	<1	<1	3	<1	8	11	2	4	<1	2	9	8

86 The quality of the commercial catch data on Ray's bream is probably reasonable. Ray's bream is a desirable species, and only a small percentage (about 1-5% annually) has been reported or observed as having been discarded. Most of the trawl catch of Ray's bream that is reported on CELR and CLR forms is retained. Most of the discarding appears to occur in the tuna fisheries, but those fisheries only take a small proportion of the total catch of Ray's bream.

87 The observations of trawl and bottom longline fisheries recording catches and discarding of Ray's bream are shown in Table 6. Again the majority of the catches were retained.

Table 6: Ray's bream catches and discards in observed trawl and bottom longline fisheries

Target species	Catch of RBM (tonnes)	% kept	Period
Arrow squid	144	98.4	1990-91 to 1997-98
Hoki	41	76.3	1994-95 to 1995-96
Jack mackerel	39	98.5	1990-91 to 1997-98
Ling	3	75.7	1990-91 to 1997-98
Southern blue whiting	0.2	7.5	1994-95 to 1995-96

- 88 This report summarises information for Ray's bream. It is likely that Southern Ray's bream (*Brama australis*) and bronze bream (*Xenobrama microlepis*) are identified as "Ray's bream", but probably only limited amounts of these species are included in the reported catch under this name.

Feeding

- 89 In New Zealand, Ray's bream eat small midwater fishes and squid. In the North Atlantic, they feed on a wide variety of nektonic prey, including small fishes, squid, and crustaceans (especially euphausiids). In Tasmania, they feed almost exclusively on the myctophid fish *Lampanyctodes hectoris*.

Number of vessels catching and landing

- 90 The number of vessels catching Ray's bream within the New Zealand EEZ also fluctuates from year to year (varying between 113 to 329 vessels). While there has been some increase in the number of vessels fishing, overall the average catch per vessel is not showing any particular trend upward or downward (varying between 1.1 and 3.6 tonnes).

Recreational catch

- 91 The National Marine Recreational Fishing Surveys in 1992-94, 1996, and 2000 do not provide any estimates of the recreational harvest of Ray's bream.

Customary catch

- 92 There is no quantitative information available to allow the estimation of the harvest of Ray's bream by customary Māori fishers. Based on MFish's general understanding of the customary and recreational fishery, MFish considers that the customary harvest is likely to be low.

Regulatory Framework

- 93 There are no existing regulations that specify catch limits or other sustainability measures for Ray's bream. There are no regulations that apply to Ray's bream that could be considered redundant as a result of entry into QMS.

Fisheries Assessment

- 94 There is no stock assessment information available for Ray's bream in New Zealand fisheries waters.
- 95 Ray's bream is a highly migratory species. Ray's bream taken in New Zealand's fisheries waters is probably part of a large, wide-ranging stock covering the entire South Pacific. The migration patterns and mixing between New Zealand and the rest of the South Pacific are not known. The catch of Ray's bream elsewhere in the South Pacific needs to be considered when assessing the status of Ray's bream within the New Zealand's exclusive economic zone (EEZ).
- 96 In summary, while the annual reported landings of Ray's bream fluctuate about 400 to 1 000 tonnes, there are no trends in catch over time. It is not known whether these fluctuations reflect changes in abundance or result from changes in fishing for target species. There is

no information available to suggest a sustainability concern at present in New Zealand fisheries waters.

Associated Fisheries

- 97 Pomfrets are important food for tunas, marlins and swordfish, and Ray's bream also are found in the stomach of sharks and moonfish (NIWA unpublished data).
- 98 Understanding of food web relationships is still at an early stage, but MFish considers that, if evidence emerges of impacts on biodiversity from harvesting of Ray's bream, this can be managed at that time based on international cooperation where appropriate

Environmental Issues

- 99 Ray's bream is predominantly taken as a bycatch by midwater trawlers in New Zealand fisheries waters for squid, hoki and jack mackerels. As Ray's bream is solely a bycatch fishery, the environmental impacts of fishing need to be considered under the management provisions of the target species, in particular the environmental aspects associated with the midwater trawl fishery.

Research

- 100 There has been no directed fisheries research specifically on Ray's bream in the past and none is planned in the short term.

Social, Cultural, and Economic Factors

- 101 MFish is not aware of any information on particular social, economic, or cultural matters that would influence the setting of TACs and TACCs for Ray's bream beyond those considered in the relevant sections earlier.

RAY'S BREAM (RBM) – FINAL ADVICE

Initial Proposal

- 1 It was proposed in the initial position paper (IPP) to set the following TAC, allowances for customary fishing interests, recreational interests and other sources of fishing-related mortality, and TACC for Ray's bream (*Brama brama*)¹ being introduced into the quota management system (QMS) on 1 October 2004 (refer Table 1).

Table 3: Proposed TAC, Allowances, and TACC for Ray's bream (*Brama brama*) in tonnes

Stock	TAC	Customary allowance	Recreational Allowance	Other sources of fishing-related mortality	TACC
RBM 1	1 025	5	10	50	960

- 2 This proposal was part of a package of measures regarding the introduction of Ray's bream into the QMS. Other measures proposed for this stock were:
- a) Recommending the inclusion of Ray's bream on the Third Schedule to the Fisheries Act 1996 (the Act) so that Ray's bream can be managed with an alternative TAC set under section 14 of the Act²;
 - b) Amending the Fisheries (Reporting) Regulations 2001 (the Regulations) to ensure that the appropriate fishstock code for reporting Ray's bream is used under the QMS; and
 - c) Setting a deemed value but no overfishing threshold, and allowing a 10% carry forward of annual catch entitlement (ACE) for Ray's bream.

Submissions

- 3 Submissions were received on the Ray's bream proposal from Te Ohu Kai Moana (TOKM), New Zealand Seafood Industry Council (SeaFIC), Sanford Limited (Sanford), Sealord Group Limited (Sealord), Tuna Management Association of New Zealand Incorporated (TUNA), and Solander Group (Solander). The submissions from Sanford and Sealord endorsed the SeaFIC submission.
- 4 The specific submissions on the proposals for Ray's bream are summarised and addressed under the relevant heading below.

¹ Ray's bream is identified by the three letter code RBM in the MFish information system

² The Minister of Fisheries does not have the power to include a species on the Third Schedule; it is done by the Governor-General by Order in Council.

Biological and Fishery Information

Submissions

- 5 The submissions received did not raise any issues concerning the biological or fishery information for Ray's bream provided in the Initial Position Paper (IPP) (refer para 57-101).

MFish Discussion

- 6 Commercial landing and discard information is now available for the most recent fishing year (2002-03) and is shown in Table 2 below. MFish considers that commercial data from the most recent fishing year should be taken into account when setting the TAC and TACC for Ray's bream as it reflects the current state of the fishery and is more likely to be more accurate than earlier fishing years because of improved reporting.

Table 2: Reported commercial landings and discards of Ray's bream from CELRs and CLRs, and LFRRs (processor reports) by fishing year (in tonnes)

Year	Reported by fishers		Total reported	Processed LFRR
	Landed	Discarded		
1990-91	245	<1	245	211
1991-92	343	<1	344	295
1992-93	407	<1	407	342
1993-94	159	3	163	160
1994-95	536	7	544	460
1995-96	778	3	782	693
1996-97	415	7	422	421
1997-98	647	8	655	520
1998-99	501	10	511	431
1999-00	453	23	476	423
2000-01	956	60	1016	926
2001-02	536	23	558	541
2002-03	364	19	383	347

Environmental Considerations

Submissions

- 7 No submissions regarding environmental considerations were received.

MFish Discussion

- 8 The IPP contains a discussion of matters relating to environmental considerations (refer IPP para 15-22, 46, 99).
- 9 MFish notes that section 8 of the Act provides for the purpose of the Act, which is to provide for the utilisation of fisheries resources while ensuring sustainability. Ensuring sustainability includes avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment. In relation to Ray's bream, MFish wishes to avoid any increased environmental impact associated with the introduction of this species to the QMS. As noted in the IPP at para 46 Ray's bream is solely a bycatch fishery and, as such, the environmental

impacts of fishing also need to be considered under the management provisions of the target species (e.g. mid-water and bottom trawl fisheries for squid, hoki, and jack mackerel).

- 10 MFish confirms that its position on environmental considerations remain as set out in the IPP.

TACs, Allowances and TACC setting considerations

Submissions

Customary and recreational allowances

- 11 **SeaFIC, Sanford, and Sealord** in discussing the allocation of allowances under the TAC state that the customary allowance should be 5 tonnes, and the recreational allowance 10 tonnes. These amounts are the same as those proposed in the IPP.

Other sources of fishing-related mortality allowances

- 12 **TOKM** consider that the data on discarded fish in the IPP is outdated and inaccurate. They consider that if the fishing methods used to take Ray's bream is taken into account then the loss of fish is a 'red herring'. TOKM contend that a 5% allowance is not needed.
- 13 **SeaFIC, Sanford, and Sealord** consider that the 50 tonnes allowance for 'other sources of mortality' is too high. They say that they have not seen persuasive evidence that the commonly utilised 5% of TACC allowance formula used to set the allowance for other sources of fishing-related mortality is justified. They recommend that this allowance be set at 10 tonnes.

TACCs

- 14 **TOKM** contend that the South Pacific stock of Ray's bream is not under any sustainability pressure and any management imposed on the fishery will have no effect on the overall stock abundance. They argue that the TACC level for Ray's Bream should be set at the highest recorded catch in recent years plus 100%.
- 15 **SeaFIC, Sanford, and Sealord** question why MFish ignored its own guidelines and statements when setting the TACC. Specifically, in the rationale for setting the TAC, MFish noted the likelihood of underreporting, no risk to sustainability, and imposed a correction factor for known potential errors. They contend that, in a clear departure from the formula used to set the TACC for other highly migratory species (HMS), MFish used the average catch over the past five years plus an allowance of 50%. For other HMS species, they claim that the TACC was set on the basis of the best catch year during the past five years plus 50%. They believe that the TACC for Ray's bream should be set at 1 525 tonnes.

MFish Discussion

TAC

- 16 In setting the TAC, MFish considers that, in the absence of better information to undertake an assessment of the potential yield of Ray's bream, the TAC should be based on estimates of current utilisation as proposed in the IPP (refer para 13). MFish has based estimates of utilisation on the best available information.

Customary and recreational allowances

- 17 The IPP contains a discussion of matters relating to the setting of the customary allowances (refer IPP para 26-28, and 92), and on recreational allowances (refer IPP para 23-25, and 91). MFish confirms that its position on customary and recreational allowances remains as stated in the IPP.

Other sources of fishing-related mortality allowances

- 18 MFish has not been able to discover any useful quantitative information on the amount of incidental mortality that can be expected of fish escaping through the mesh of trawl nets and subsequently dying from injuries sustained during their experience in and escapement from the trawl net. TOKM, SeaFIC, Sanford, and Sealord do not provide any evidence to support their contention that 5% of the TACC is too high a level at which to set the fishing-related mortality.
- 19 MFish notes that 99% of the Ray's bream catch is taken by trawling (mid-water 85%, and bottom trawl 14%). With such a large percentage of the catch taken by trawling MFish considers it appropriate that an allowance should be made for incidental mortality of injured fish escaping from the trawl nets. In the absence of better information, MFish consider that it is appropriate to set the level fishing-related mortality at 5% of the TACC. If further information becomes available in the future on the factors influencing these aspects of fishing-related mortality, the percentage can be adjusted upward or downward as appropriate. MFish notes that the allowance proposed for other sources of fishing-related mortality for Ray's bream is in addition to the proposed TACC.
- 20 The IPP contains a discussion of matters relating to the setting of the allowances for other sources of fishing-related mortality (refer IPP para 29-32). MFish confirms that its position on the allowance for other sources of fishing-related mortality remains as stated in the IPP.

TACC

- 21 MFish identified in the IPP that the risk to sustainability with Ray's bream was considered to be low as the best available information suggests that it should be resilient to fishing (see IPP para 17, 70). In the IPP, MFish proposed to set the TAC based on average recent commercial catches with a 50 percent increment as a development opportunity and to cover potential reporting errors, plus setting allowances for non-commercial fishing and fishing-related mortality.

- 22 While acknowledging that the risk to sustainability with Ray's bream is considered to be low, MFish identified in the IPP that this assessment was based on limited knowledge of Ray's bream in New Zealand waters and was largely based on information on Ray's bream and closely related species from elsewhere. MFish also notes that the catches of Ray's bream in the South Pacific, as identified in the IPP (see para 81), have escalated to 16 000 tonnes since 2001. Whether these increased catch levels are sustainable in the long-term is not known. MFish believes that an element of caution is needed when setting the TAC/TACC prior to the provision of better information anticipated from management under the QMS and an extended period of fishing at higher catch levels. MFish, therefore, does not support TOKM position that the TACC should be based on the best catch plus a 100% increment.
- 23 SeaFIC, Sanford and Sealord are not correct in their belief that MFish departed from the formula for Ray's bream for setting TACCs for HMS. The formula they cite of best catch year plus 50 percent was the formula used for the tuna species, and moonfish (with options of 25 or 50%). For the other HMS bycatch species; blue shark, mako shark, porbeagle shark, and Ray's bream, MFish used average recent catch levels plus 25 or 50 percent, depending on the species.
- 24 For Ray's bream there is one year (2000-01) with a catch of 1 016 tonnes which is an outlier compared to all other years (see Table 2). The 2000-01 catch is 300-500 tonnes higher than any other recent year, and is 234 tonnes higher than the next best year in 1995-96. The reported catch for 2000-01 is abnormal, hence MFish proposes to use average catch to provide a more representative figure on which to base the calculation of TAC/TACC.
- 25 MFish considers that recent catch data is more likely to represent better reporting of catch, as fishers have become aware of the importance of catch records with new species being introduced into the QMS in the past few years. As noted in para 6, MFish proposes to use the data from the most recent fishing year (2002-03) and proposes to take the average of the most recent 3 years plus allow a 50 percent increment for developmental opportunity to establish the TACC for Ray's bream. MFish considers the risks associated with the 50 percent increase are manageable, and provide opportunity for the development of what is considered to be an under-utilised fishery. Using this formula gives a proposed TACC of 980 tonnes, which is 20 tonnes higher than that proposed in the IPP.
- 26 The commercial industry contends that setting of low TACCs for bycatch species, like Ray's bream, will constrain the target fisheries. MFish notes that 99% of the Ray's bream catch has been taken by trawling for QMS species, mainly squid, hoki, and jack mackerels³. These species have been in the QMS since 1986 and their target trawl fisheries have recorded bycatch of Ray's bream since that time. The proposed TACC of 980 tonnes is well in excess of the bycatch requirements in these trawl fisheries⁴, apart from the one exception in the 2000-01 fishing year when a total catch of 1 016 tonnes was reported.

³ MFish notes that the large reported catch in 2000-01 was largely the result of additional targeting of jack mackerels, and to a lesser extent squid, rather than additional reporting of Ray's bream catches by tuna fishers

⁴ In these trawl fisheries there has been little recorded discarding of Ray's bream, and MFish has no evidence of non-reporting of Ray's bream catches in these fisheries

- 27 Currently the tuna fisheries provide a very minor component of the total reported catch of Ray's bream. However, if there has been large-scale non-reporting of Ray's bream catches in the tuna fisheries, then the TACC for Ray's bream may be insufficient and provide constraints on fishing for the target species. Introduction of the tunas and Ray's bream into the QMS will provide better reporting of catches. MFish proposes to keep these HMS under regular review, so that adjustments can be made to the TACCs if they have been set either too optimistically or too conservatively. MFish believes the TAC proposal is consistent with section 14 of the Act and the TACC proposal consistent with section 21 in that the matters to be taken into account when setting a TACC have been considered. MFish also believes that the proposed TAC and TACC levels provide for utilisation of Ray's bream while ensuring its sustainability (section 8).

Social, Cultural and Economic Factors

- 28 Social, cultural and economic factors relevant to sustainability proposals for Ray's bream were outlined in the IPP at para 20, 46, and 101.

Submissions

- 29 **Sealord** note that a range of species, such as Ray's bream, will be brought in to the QMS with most of the TAC allocated to the Crown. They note that these species are taken primarily as by-catch and there are no sustainability concerns. They strongly believe there should be a change to the catch history years, so that the quota is allocated to fishers on the basis of the catch history over recent years.
- 30 **Solander** believes no TAC or TACC can be set without addressing the bycatch allocation issue.
- 31 **SeaFIC** also raises the issue of bycatch allocation, as they feel the perceived lack of opportunity to secure adequate quota will constrain the development opportunity of tuna fisheries.
- 32 **TUNA** is concerned about the impacts on tuna fishers of the mismatch in catch history years between tuna and the tuna bycatch species and wants to ensure that fishers get their "true recent by-catch".

MFish Discussion

- 33 MFish notes that the mismatch in catch history periods for tuna and bycatch species is subject to a separate review and does not relate to the setting of sustainability measures. This issue is addressed further in the generic section of this advice.
- 34 MFish confirms that its position on social, cultural and economic factors remain as stated in the IPP.

Other Management Measures

Submissions

Third Schedule

- 35 **SeaFIC, Sanford, Sealord, and TOKM** support recommending the inclusion of Ray's bream in the Third Schedule, but note that within season adjustments to the TAC will be impractical because of the difficulties of measuring in-season abundance.

Deemed value and overfishing threshold

- 36 **TOKM** agree with the proposed deemed value as stated in the IPP, and with the proposal to set no differential deemed value or overfishing threshold for Ray's bream.
- 37 **SeaFIC, Sanford, and Sealord** are concerned about the use of outdated port prices in setting and adjusting deemed values. They note that the port prices used to set deemed values in the IPP are based on 2001-02 landings whereas ex-vessel values in 2004-05 are likely to generally be lower than from 2001-02 port prices, primarily due to the rise in the New Zealand dollar relative to most overseas currencies.

MFish Discussion

- 38 Submissions support recommending the addition of Ray's bream to the Third Schedule to the Act and MFish confirms its view that this is appropriate for this highly migratory species. A recommendation to this effect is contained in separate advice.
- 39 Submissions cast doubt on the practicality of in-season adjustments in TAC for highly migratory species. MFish considers that, where a clear case exists that the TACC is likely to be over caught during a year, an in-season adjustment to the TAC could be used. MFish acknowledges that in-season adjustments may be less likely for Ray's bream, compared to other HMS, as it is largely a bycatch of midwater trawl fisheries for squid, hoki and jack mackerel. In-season adjustments could be used in situations in the interim if there was a much greater abundance of Ray's bream in one season and catch levels were clearly running ahead of previous years. So while MFish may need to wait for several years of catch information before reassessing recommendations concerning the TACC, there is the option of using in-season adjustments in the interim.
- 40 There are no known sustainability concerns for Ray's bream and MFish has proposed prospective catch limits for this species. MFish does not wish to impose unreasonable constraint on fishers particularly during a period of rationalisation of the fishery.
- 41 The TACC proposed should be sufficient to satisfy demand in the fishery for bycatch. In this environment MFish considers that a deemed value for Ray's bream should be on the lower end of the continuum between port price and the transaction costs involved in acquiring and or holding a quantum of ACE. This will also reduce the potential for deemed values to distort the market for ACE during the period of transition of Ray's bream into the QMS.

- 42 For this reason, while MFish notes that in the IPP it was proposed that a deemed value should be set at 60% of the port price for Ray's bream, MFish now proposes that deemed values are set at a lower level. A deemed value of \$0.71/kg for Ray's bream (based on a port price of \$1.18/kg) was suggested in the IPP. A port price of \$0.73/kg has now been determined for Ray's bream. MFish acknowledges that the deemed value level should be linked more appropriately to the ACE value but this value is not known at this time. Therefore, MFish proposes to set a deemed value of \$0.18/kg for Ray's bream based on 25% of the new port price (\$0.73/kg), which is above the likely transaction, and levy costs anticipated for this fishery.
- 43 MFish confirms its position, as stated in the IPP (refer to IPP para 44-45) that no differential deemed value or overfishing threshold be set for the Ray's bream stock.

Legal Obligations

- 44 The statutory considerations that must be taken into account when setting a TAC and allowances for Ray's bream were identified in the IPP (refer to IPP para 46). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Recommendations

45 MFish recommends that you:

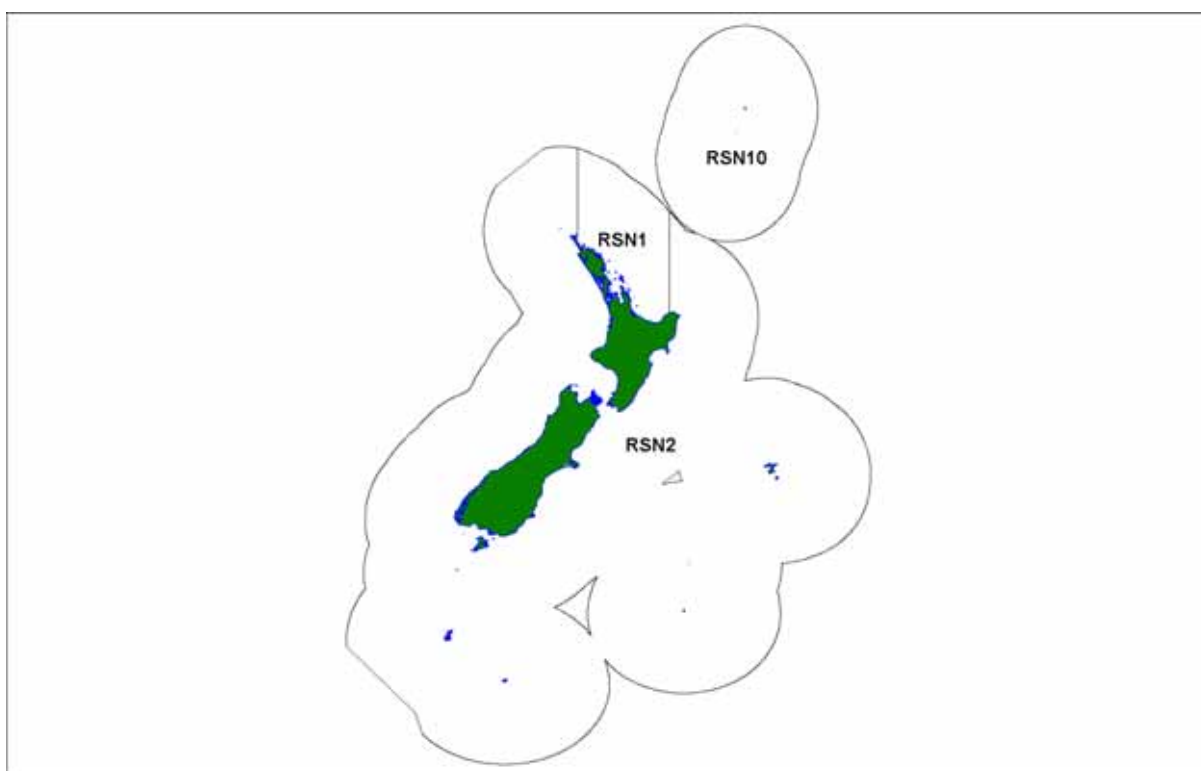
- a) **Agree** that the purpose of the Act is better achieved by setting a TAC for Ray's bream other than in accordance with section 13(2).
- b) **Agree** to set a TAC for Ray's bream pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 1 045 tonnes for RBM 1 and within that TAC set:
 - i) A customary allowance of 5 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 50 tonnes; and,
 - iv) A TACC of 980 tonnes.
- d) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns for Ray's bream.
- e) **Agree** to set an annual deemed value for Ray's bream of \$0.18/kg.
- f) **Note** that it is not proposed to set a differential deemed value or overfishing threshold for the Ray's bream stock.

RED SNAPPER (RSN) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Red snapper (*Centroberyx affinis*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Areas (QMAs) for red snapper stocks are identified in Figure 1. The fishing year for red snapper will start on 1 October and end on 30 September of the following year. The Total Allowable Commercial Catch (TACC) and Annual Catch Entitlements (ACE) for each stock will be expressed in kilograms greenweight.

Figure 1: Quota Management Areas for red snapper stocks.



Key Issues to be Considered

- 2 The key issues to be considered for red snapper are:
 - a) There is no stock assessment information indicating whether red snapper stocks are at, above, or below a level that can produce MSY;
 - b) There is no stock assessment information to suggest a sustainability concern at current catch levels;
 - c) The biological and ecological characteristics of red snapper as a reef fish may make it susceptible to overfishing; and
 - d) Anecdotal concerns from environmental and recreational fishing groups about the sustainability of red snapper.

List of Management Proposals

3 MFish proposes the following catch limits for red snapper.

Table 1: Proposed TACs, TACCs, and allowances for red snapper (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
RSN 1	141	2	13	1	125
RSN 2	23	1	2	1	19
RSN 10	4	1	1	1	1

4 MFish also proposes to:

- a) Amend the reporting regulations to ensure that the appropriate fishstock codes for red snapper are used under the QMS;
- b) Set deemed values and an overfishing threshold for red snapper; and
- c) Set a bag limit for red snapper for amateur fishers by regulation.

TACs

TAC Management Strategy

- 5 MFish proposes to set TACs for red snapper using the provisions under s 13 of the 1996 Act. As an alternative to setting a TAC under s 13, the 1996 Act allows TACs to be set under s 14, provided that one of the three criteria specified in s 14(8) is applicable. However, MFish does not consider that those criteria are readily applicable to red snapper. First, MFish considers that a maximum sustainable yield could be estimated for red snapper stocks. Second, a catch limit (for any red snapper stock) has not been determined as part of an international agreement. Third, red snapper stocks are not likely to be managed on a rotational or enhanced basis in the medium term because this sort of management is mainly applicable to established target fisheries for valuable sedentary shellfish species such as scallops.
- 6 Section 14B of the Act provides a further management strategy. This provision enables the Minister to set a TAC that maintains the stock at a level that ensures its long-term viability, while other inter-related stocks can be taken at TAC and TACC levels set for those stocks based on B_{MSY} . Section 14B essentially allows for a stock to be managed below B_{MSY} . MFish regards s 14B as inappropriate for red snapper or any of the northern reef fish species due to the biological and ecological characteristics of these species as outlined below.

Rationale for Proposed TACs

- 7 There is no stock assessment information available for red snapper. There are no estimates of current biomass for any red snapper fishstock. Accordingly, there is no scientific information as to whether the red snapper stocks are at, above, or below a level that can produce MSY. There is also no quantitative CPUE information available for red snapper, partly because red snapper is generally reported as a bycatch species.

- 8 Information on the biology of red snapper indicates that it is long-lived and likely to be a relatively unproductive species. In 1993, a regulatory¹ prohibition on sale was introduced for a number of “reef” fish species because of concerns over sustainability. This prohibition did not include red snapper, although it is a “reef” species.
- 9 During discussions on the prohibition on sale, recreational and environmental groups expressed concern about a decline in abundance of red snapper. However, there is no stock assessment information to suggest a sustainability concern, and there is no trend in commercial catch information to indicate a change in abundance of this species.
- 10 However, MFish acknowledges the lack of information on the relationship of the current biomass to B_{MSY} , the potential risk associated with the biology of the species, and the anecdotal concerns of recreational and environmental groups. Accordingly, MFish considers that the proposed initial TACs should be based on average catch information, rather than provide an opportunity for development by setting a TAC above the level of estimated average catch.
- 11 MFish notes that the introduction of red snapper into the QMS and setting TACs/TACCs could provide the opportunity for an increase in set net activity on northern reefs. This may result in an increase in the catch of bycatch species covered by the sale prohibition regulation. MFish notes that there is a very small catch of red snapper currently taken by set net (2 tonnes in the 2001–02 fishing year). The majority of catch is taken as a bycatch of the longline and trawl fishery. MFish considers that the TACs proposed are unlikely to be large enough to promote development of a set net target fishery. Also, concerns over the impact of fishing on benthic communities will be addressed via the MFish Environmental Management Strategy and subsequent environmental standards.
- 12 MFish notes that introduction of species into the QMS and setting of species-specific catch limits will better ensure sustainability of the species through incentives created by the balancing regime. Under the current regime, bycatch of “no sale” reef fish species can legally be returned dead to the water with no penalty.
- 13 The proposed TACs are based largely on recent reported commercial landings of red snapper by averaging the commercial catch over the last nine fishing years since 1993–94 for the following reasons. Commercial landings prior to 1989–90 were not used because this information is less reliable. The CELR reporting system was introduced in August 1989. The CELR system greatly improved the reliability of the commercial landings data starting with the 1989–90 fishing year. Commercial landings before 1992–93 were not used because the sale prohibition regulation was introduced in late 1993. MFish considers that landings more than ten years ago prior to the sale prohibition do not provide an appropriate representation of the current fishery.
- 14 The proposed TACs were developed by combining the commercial catch, with the allowance for the non-commercial catch, and other sources of fishing-related mortality. MFish considers that TACs set at these catch levels should ensure that red snapper is

¹ Regulation 20E of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986, Amendment No. 7 SR 1993/279) prohibited the sale of 19 reef fish species: red moki, painted moki, red pigfish, Sandager's parrotfish, scarlet parrotfish, banded parrotfish, green parrotfish, giant boarfish, long-finned boarfish, marblefish, notch-headed marblefish, kelpfish (hiwihiwi), silver drummer, butterfly perch, splendid perch, toadstool groper, rock cod, red mullet (goatfish) and black angelfish.

managed at a level at or above B_{MSY} in the mid to long-term as required by s 13 of the 1996 Act.

RSN 1

- 15 MFish proposes that the TAC for RSN 1 be set at 141 tonnes. This is based mainly on the average (125 tonnes) of the commercial landings from 1993–94 to 2001–02 (Table 2 in Annex Two). As explained below, the allowances then contribute to the balance of the proposed TAC.

RSN 2

- 16 MFish proposes that the TAC for RSN 2 be set at 23 tonnes. The average of the RSN 2 commercial landings for 1993–94 to 2001–02 is 19 tonnes. The allowances (explained below) then provide the balance to the proposed TAC at 23 tonnes for RSN 2.

RSN 10

- 17 The following small commercial landings of red snapper have been reported from FMA 10 (Kermadec Fishery Management Area): 21 kg 1990–91, 646 kg 1991–92, 18 kg 1994–95, and 156 kg 1996–97. Red snapper is likely to occur in FMA 10, however the area within 12 nautical miles of all the Kermadec Islands are designated as marine reserves with all amateur and commercial fishing prohibited. It is likely that these small catches of red snapper in FMA 10 were taken from deep reefs and pinnacles outside the reserve areas. MFish therefore considers that it is appropriate to propose a low TAC of 4 tonnes for RSN 10 to allow for red snapper caught outside the reserve areas.

Allocation of TAC

Recreational Allowance

- 18 As indicated in Annex Two, the National Marine Recreational Fishing surveys provide no quantitative estimates of the recreational catch of red snapper from any stocks. However, it is likely that recreational fishers take red snapper when fishing for snapper on the deep reefs and around the offshore islands of east Northland, the outer Hauraki Gulf, and the Bay of Plenty.
- 19 Based on MFish's general understanding of the recreational fishery, MFish considers that the recreational red snapper catch is likely to be around 10% of the TACC. Accordingly, the following recreational allowances are proposed: 13 tonnes RSN 1; 2 tonnes RSN 2; and 1 tonne RSN 10.
- 20 When considering the allowance for recreational interests in each of the red snapper fishstocks, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made under s 311 of the Act. No such regulations have been made, and accordingly no adjustment to the proposed allowances needs to be considered on this basis.

Customary Māori Allowance

- 21 The levels of Māori customary catch of red snapper are not known. However, it is likely that Māori customary fishers will periodically catch red snapper. MFish considers that the customary allowance should be set at 15% of the recreational allowance. Proportional allocations of around 15% between the non-commercial sectors have been used for the snapper (SNA 1, SNA 2, SNA 7, SNA 8) and TAR 1 fisheries. MFish considers that these relative proportions between the two non-commercial sectors are appropriate for snapper and red snapper as both are mainly northern hook and line fisheries.
- 22 MFish proposes the following Māori customary allowances for red snapper: 2 tonnes RSN 1; 1 tonne RSN 2; and 1 tonne RSN 10. MFish notes that the customary allowance is not intended to limit the extent of customary catch, but rather to provide for the likely level of that catch.
- 23 In considering the allowance for Māori customary non-commercial interests, the Minister is required to take into account any mātaihai reserve or s 186A closure in the relevant QMA. MFish does not consider that the allowances proposed for the customary catch will detract from the intent of any mātaihai or s 186A closure presently in place, nor will the allowance be likely to be insufficient in terms of the customary use of red snapper in these areas.

Allowance for other sources of mortality

- 24 It is likely that there will be a small amount of other sources of mortality of red snapper in the future due to gear problems such as damaged or burst trawl nets and lost set nets. MFish has no quantitative information on the extent of this mortality, but it is likely to be less than 1 tonne given the relatively small size of the red snapper catch. Accordingly, MFish proposes a nominal allowance of 1 tonne for other sources of fishing-related mortality for each of the red snapper stocks.

TACC

- 25 The rationale for the proposed TACCs for red snapper was indicated above in the section explaining the rationale for TAC setting. MFish has proposed the following TACCs for red snapper: 125 tonnes RSN 1; 19 tonnes RSN 2; and 1 tonne RSN 10.

Other Management Measures

Amateur bag limits

- 26 As part of the process of setting TACs and TACCs for red snapper, MFish proposes to set by regulation a maximum daily bag limit for red snapper for amateur fishers. Currently, there is no bag limit for red snapper and an individual amateur fisher could theoretically catch as much red snapper as was desired. This situation is not appropriate for a species that has a potential for overfishing due to the particular biological and ecological characteristics of red snapper.
- 27 Red snapper is seldom caught around the South Island by amateur fishers. Accordingly, MFish considers that it is only necessary to propose amateur bag limits for red snapper for the three northern regulatory areas. Specifically, for the Auckland and Kermadec Area, and Central Area, MFish proposes that red snapper should be included in the combined multi-species bag limit set at 20 finfish per fisher per day for each regulatory area. Most of the

other common inshore species (eg, red gurnard, John dory, trevally) that are part of the QMS are already included in the combined species bag limit.

Consequential amendment to regulation

- 28 As a consequence of introducing red snapper into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this document.

Deemed values and overfishing thresholds

- 29 A separate section at the end of this document sets out generic information on the setting of interim and annual deemed values and overfishing thresholds proposed for red snapper. Based on the current port price for red snapper (\$5.46 per kg), MFish proposes an annual deemed value of \$4.09 per kg. This is based on the proposition that the annual deemed value for species such as red snapper (considered in the category “all other fishstocks”) should be set at 75% of the average port price.
- 30 MFish does not consider that an overfishing threshold should be established for red snapper. Overfishing thresholds are generally only applied to high value single target fisheries such as rock lobster, paua, and scallops.

Statutory Considerations

- 31 Before setting (or varying) any sustainability measure (which includes a TAC), the Minister must consider a range of factors as outlined in the Statutory Obligations and Policy Guidelines section.
- a) The purpose of the Act (s 8) is to provide for the utilisation of fisheries resources while ensuring sustainability. The proposed management measures seek to ensure the sustainability of red snapper by setting TACs and bag limits for amateur fishers at appropriate levels. Under the QMS and the proposed TACCs and allowances, utilisation will be better provided for as fishers are able to better plan their fishing activities due to the security of quota and ACE;
 - b) The Act includes obligations to avoid, remedy, or mitigate any adverse effects of fishing on the aquatic environment, and that those effects and management measures are taken into account when decisions are made about the sustainable utilisation of fishery resources. TACs set at current catch levels should ensure that there is no increase in the adverse effects on benthic assemblages due to set netting and trawling on or near reefs;
 - c) Under s 13 of the 1996 Act, the TAC should be set at a level that moves the stock towards the level that can produce the MSY. No scientific stock assessment information is available indicating whether red snapper stocks are at, above, or below a level that can produce MSY. Non-commercial groups have concerns about the sustainability of red snapper, however the total red snapper catch remained reasonably stable through the 1990s. As indicated earlier, MFish considers that the proposed TACs should enable red snapper to be managed at or above B_{MSY} in the mid to long term;

- d) Section 13 also requires consideration of the environmental conditions affecting the stock. There is no information available on environmental conditions and how these may affect the productivity of red snapper. For example, it is not known how water temperatures and other environmental factors affect recruitment success and the natural annual variability in the production of juveniles into adult red snapper stocks;
- e) Section 9(a) requires that associated or dependent species should be maintained above a level that ensures their long term viability. Similarly, s 9(b) requires the maintenance of biological diversity. Section 9(c) requires the protection of habitat of particular significance to fisheries management. Red snapper live in close proximity to a variety of other associated deeper water reef species in that habitat, and will be in competition for both space (shelter) and the passing planktonic food with some other reef fish species. However, the extent of the inter-dependence and relationship of red snapper with other open water semi-pelagic species is unknown. Rocky reefs are important areas for biodiversity, and are also an important habitat to fisheries management especially for rock lobster and paua;
- f) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers the s 5 consideration arising from New Zealand's international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed by the management proposals for red snapper;
- g) Section 11(1)(b) requires that existing controls are taken into account when setting or varying a sustainability measure such as a TAC. MFish notes that no catch limits have been set for red snapper. The standard method/mesh restrictions apply to the trawl fisheries that take red snapper as a bycatch. There is currently no size limit restriction or amateur bag limit restrictions. MFish considers that none of the existing fisheries management controls are directly relevant to setting TACs for red snapper;
- h) Section 11(2) requires the consideration of various other matters relating mainly to planning documents. MFish is not aware of any considerations in any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991 or the Conservation Act 1987 that are specifically relevant to setting TACs for red snapper stocks. Similarly, MFish is not aware of any fisheries or conservation services decisions, or any decisions not to require conservation or fisheries services that are relevant to setting TACs for red snapper. No fisheries plans have been approved that would have any bearing on setting the TACs for red snapper stocks; and
- i) As required under s 12(2)(c), MFish considers that the proposals for red snapper meet the requirements of ss 7 and 8 of the Hauraki Gulf Marine Park Act 2000. The proposed catch limits for red snapper stocks into the QMS will allow for the sustainable utilisation of the species by all fishing interests. The small bycatch of red snapper in target fisheries within the park boundaries is likely to be better reported and managed under the requirements of the QMS.

Preliminary Recommendations

32 MFish recommends that the Minister:

- a) **Agrees** to set a TAC of 141 tonnes for RSN 1 and within that TAC set:

- i) A customary allowance of 2 tonnes;
 - ii) A recreational allowance of 13 tonnes;
 - iii) An allowance for other fishing-related mortality of 1 tonne; and
 - iv) A TACC of 125 tonnes.
- b) **Agrees** to set a TAC of 23 tonnes for RSN 2 and within that TAC set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 2 tonnes;
 - iii) An allowance for other fishing-related mortality of 1 tonne; and
 - iv) A TACC of 19 tonnes.
- c) **Agrees** to set a TAC of 4 tonnes for RSN 10 and within that TAC set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance for other fishing-related mortality of 1 tonne; and
 - iv) A TACC of 1 tonne.
- d) **Agrees** to include red snapper as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986.
- e) **Agrees** to include red snapper as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.
- f) **Agrees** to set a deemed value for all of the red snapper stocks at \$4.09 per kg.
- g) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.

ANNEX ONE

Species Information

Species Biology

- 33 Red snapper (*Centroberyx affinis*), also known as golden snapper, is a member of the family Berycidae (alfonsinos) that occurs in different parts of the world's oceans and seas, often associated with seamounts and similar seafloor features. Red snapper is present throughout New Zealand coastal waters, but is generally rare south of East Cape and Cape Egmont. Red snapper is found on deep coastal reefs, often in caves and overhangs, as well as in open waters to depths of about 400 metres. Its relative abundance within this depth range is unknown. Red snapper stocks might be comprised of localised populations.
- 34 There have been few biological studies on red snapper in New Zealand. Some informal studies on age and growth of New Zealand red snapper suggest that the species may be long-lived, perhaps to 80 years. Australian studies have indicated that red snapper have a lifespan of 33-40 years, and possibly longer. Advice from NIWA is that red snapper should be considered a moderately long-lived, slow-growing, and relatively unproductive species.
- 35 Average size of red snapper is 30-40 cm, with a maximum size of 55 cm. Red snapper are planktonic feeders on crustaceans and small fish, and appear to be more active at night. Red snapper live in close proximity to a variety of other deeper water reef species in that habitat, and will be in competition for both space (shelter) and the passing planktonic food with some other reef species. Its relationship with other open water semi-pelagic species is unknown.

Fishery characteristics

Commercial catch

- 36 Small commercial catches of red snapper in New Zealand have almost certainly been made for decades, but would have been included among "assorted minor species" in reported landings. Catches probably increased with the rise in deeper water set netting in the 1970s. There are records of 4 tonnes in 1974, 2 tonnes in 1975, and then from 20 tonnes to 60 tonnes between 1977 and 1982. NIWA reported that catches through the 1980s are unknown, but likely to have been about 50 tonnes.
- 37 The reported landings of red snapper are low, with an average annual catch of 130 tonnes for all FMAs combined for the period from 1989–90 to 2000–01 (refer Table 2). Total red snapper landings increased by approximately 50% during the 1990s, from about 100 tonnes in the early 1990s, to nearly 200 tonnes in 2000–01.
- 38 The largest landings were from FMA 1 with an average annual catch of 114 tonnes (refer Table 2). FMA 1 consistently accounted for around 90% of the commercial landings during the 1990s, and this has almost certainly always been the situation. Only small quantities are reported for the adjacent FMAs (2 and 9). Negligible quantities (only one year with a catch of less than 1 tonne) were reported from FMAs 4 and 10. Zero red snapper was reported in FMAs 5 and 6 for all years from 1989–90.

- 39 MFish considers that the discarded or under-reported catch of red snapper is likely to have been negligible as a non-QMS species. This is because there is a reasonably good market for selling red snapper and fishers can achieve good prices.

Table 2: Reported landings (tonnes) by commercial fishers of red snapper by FMA from 1989–90 to 2001–02. Data are derived from the landing section of CELRs and CLRs.

Fishing Year	1	2	3	4	7	8	9	10	Unknown Area	Grand Total
1989-90	67.9	3.0	3.1	0.0	1.8	0.9	0.0	0.0	0.0	76.7
1990-91	107.3	1.2	2.8	0.0	0.6	0.7	0.0	0.0	0.0	112.7
1991-92	89.1	0.7	1.1	0.0	0.0	1.6	0.0	0.6	0.0	93.2
1992-93	98.2	2.1	0.4	0.0	0.0	0.6	0.0	0.0	0.3	101.6
1993-94	78.2	2.6	0.3	0.1	0.4	0.4	0.2	0.0	0.0	82.4
1994-95	78.2	1.8	0.3	0.0	0.2	0.6	0.5	0.0	1.0	82.6
1995-96	126.7	2.1	0.8	0.2	1.2	0.2	1.0	0.0	1.3	133.4
1996-97	186.4	17.4	0.9	0.0	1.0	0.3	2.9	0.2	2.8	211.8
1997-98	159.1	3.4	0.3	0.0	0.2	0.7	3.6	0.0	0.8	168.2
1998-99	134.4	1.5	0.4	0.1	0.3	1.0	4.7	0.0	0.4	142.8
1999-00	108.1	1.3	0.8	0.0	0.1	21.3	25.4	0.0	0.7	157.7
2000-01	140.0	1.1	2.3	0.8	0.0	0.8	51.5	0.0	0.0	196.5
2001-02	109.7	1.5	2.2	0.1	0.0	0.4	12.3	0.0	0.6	126.7

- 40 There was considerable variation in catch by method during the 1990s (refer Table 3). Longline catches generally rose, but declined again in recent years. Trawl catches fluctuated greatly, with a slight upward trend. Set net catches rose until 1996, and then declined to almost zero.

Table 3: Estimated catch (tonnes) by commercial fishers of red snapper by method from 1989–90 to 2001–2002. Data are derived from the estimated catch section of CELRs and CLRs.

Fishing year	Longline	Trawl	Setnet	Dropline
1989–90	4	37	19	2
1990–91	10	52	20	2
1991–92	11	26	31	2
1992–93	16	19	40	1
1993–94	19	13	32	1
1994–95	22	15	34	1
1995–96	30	26	49	< 1
1996–97	52	46	45	1
1997–98	96	23	20	1
1998–99	65	16	17	1
1999–00	67	59	5	1
2000–01	66	82	2	< 1
2001–02	43	59	2	1

- 41 A very small quantity of red snapper was reported as targeted. Most was a bycatch in fisheries for snapper, tarakihi, and trevally (refer Table 4).

Table 4: Estimated catch (tonnes) by commercial fishers of red snapper by target species from 1989–90 to 2001–2002. Data are from the estimated catch section of CELRs and CLRs.

Fishing Year	Target species								
	Snapper	Tarakihi	Trevally	Groper	Gemfish	Hoki	Kingfish	Red snapper	Other ¹
1989–90	8	30	7	2	1	3	1	2	8
1990–91	10	48	5	3	2	< 1	4	9	6
1991–92	14	32	6	2	4	1	4	1	6
1992–93	17	33	11	3	2	1	3	< 1	6
1993–94	19	28	7	2	2	1	1	< 1	5
1994–95	22	20	14	2	1	2	2	< 1	8
1995–96	33	26	24	2	4	2	3	< 1	12
1996–97	54	41	21	2	7	6	< 1	1	11
1997–98	85	23	11	5	11	< 1	0	0	5
1998–99	63	18	6	3	1	< 1	0	< 1	8
1999–00	62	44	3	7	1	< 1	0	< 1	15
2000–01	71	64	4	6	< 1	1	0	0	5
2001–02	38	57	2	5	< 1	< 1	0	< 1	4

Note: 1. “Other” target species include (in descending order of importance) barracouta, bluenose, gurnard, rig, school shark, blue moki, warehou, and kahawai, plus 43 other species, several of which seem unlikely and imply unresolved errors in the database.

- 42 Most red snapper is taken as bycatch in the longline fishery for snapper off east Northland, the trawl fisheries for tarakihi off east and west Northland, and the setnet fishery for snapper and trevally in the Bay of Plenty (refer Table 5). However, these are mean values, and given the changes in the relative importance of methods and target species during the 1990s (refer Tables 3 and 4) they can only be a generalisation.

Table 5: Reported catch (as bycatch) of red snapper by QMA, method, and target species, and list of the main statistical areas in which catches were reported.

QMA	Method	Target species	Main statistical areas	Mean QMA catch (tonnes) ¹	
				By fishery ²	All fisheries ³
1	Longline	Snapper	2, 3	31	78
	Trawl	Tarakihi	2	15	
	Dropline	Gropers	2	< 1	
	Setnet	Tarakihi	8, 9, 10	8	
	Setnet	Trevally	8, 9, 10	8	
2	Trawl	Gemfish	12	1	3
3	Trawl	Tarakihi	18	< 1	1
8	Trawl	Tarakihi	41	2	2
9	Longline	Snapper	47	3	15
	Trawl	Tarakihi	47	7	
	Trawl	Snapper	47	2	
	Trawl	Barracouta	47	1	

Notes:

1. For fishing years 1989–90 to 2001–02

2. By method and target species for the whole QMA.

3. Bycatch in all fisheries within QMA, including minor fisheries not listed separately.

Customary and recreational catch

- 43 The National Marine Recreational Fishing surveys in 1994, 1996, and 2000 do not provide an estimate of the recreational catch of red snapper. Based on this and MFish's more general understanding of the recreational fishery, MFish considers that the overall recreational catch of red snapper is likely to be low. It is likely that recreational fishers will periodically catch red snapper while line fishing over deep reefs in Northland, the outer Hauraki Gulf, and Bay of Plenty.
- 44 There is no quantitative information available to allow the estimation of the amount of red snapper taken by customary Māori fishers. Based on MFish's general understanding of the customary and recreational fishery, MFish considers that the Māori customary catch of red snapper is likely to have been very low.

Regulatory Framework

- 45 There are no existing regulations that specify catch limits or other sustainability measures for red snapper. There is no minimum size limit for red snapper for amateur or commercial fishers. There is no species-specific or "combined species" bag limit regulations for red snapper for amateur fishers. There are no regulations that apply to red snapper that could be considered redundant as a result of QMS entry.

Fishery Assessment

- 46 There has been no scientific assessment of the biomass that can support the Maximum Sustainable Yield (MSY) for red snapper. The reference or current biomass of any of the red snapper stocks is not known. There has also been no research to determine if there are separate biological stocks of red snapper.

Environmental issues

- 47 Environmental issues in relation to the red snapper fishery were discussed in the main paper as part of the rationale for TAC setting.

Current and Potential Research

- 48 There has been no directed fisheries research specifically on red snapper in the past, and no directed fisheries research is planned in the next two to three years.

Social, economic, or cultural factors

- 49 MFish is not aware of any information on particular social, economic, or cultural matters that could influence the setting of TACs and TACCs for red snapper beyond those considered in the relevant sections earlier.

RED SNAPPER (RSN) – FINAL ADVICE

Initial Proposal

- 1 MFish proposed in the IPP to set the TACs, TACCs and allowances for customary fishing interests, recreational interests, and other sources of fishing-related mortality for red snapper as outlined in Table 1 below.

Table 1: Proposed TACs, TACCs and allowances for red snapper.

	RSN 1	RSN 2	RSN 10
TAC	141	23	4
TACC	125	19	1
Customary	2	1	1
Recreational	13	2	1
Other mortality	1	1	1

Submissions

- 2 MFish received three submissions on the red snapper proposals from the **Northern Inshore Fisheries Company Limited** (Northern Inshore), **Te Ohu Kai Moana** (TOKM) and the **Northland Conservation Board** (Northland Conservation Board). The specific submissions on the proposals for red snapper are summarised and addressed under the relevant headings below.

Biological and Fishery Information

Submissions

- 3 Northern Inshore notes that the biology and abundance of the red snapper is not well understood. However, the Company considers it is known that as well as a reef habitat, this species is also relatively commonly found in open water similar to snapper (*Pagrus auratus*). This allows for open water migration and replacement of populations as well as the slower reef fish larval replacement. The Company considers that this would indicate that the population could sustain higher levels of catch than reef habitat restricted species.
- 4 Northern Inshore states that anecdotal evidence from commercial fishers is that red snapper are not uncommon in open water habitats between 100-400 metres. They are caught as bycatch in trawl in open space above stony ground and by longline in open areas. The Company considers this supports the observations that red snapper is not a reef habitat restricted species.

MFish Discussion

- 5 MFish is aware that the biological and ecological characteristics of red snapper are different to other reef fish species as red snapper are caught in open water habitat to depths of about

400 metres. For this reason, MFish has not proposed to include red snapper in the regulation prohibiting the sale of 19 reef fish species¹.

TACs, allowances and TACC setting considerations

Submissions

- 6 Northern Inshore supported the inclusion of red snapper into the QMS as the Company believes that there is development potential for this fishery. Northern Inshore is disappointed that the TACs proposed will not provide a development opportunity, or allow for some level of initial development as an incentive for the industry to invest in the collection of additional information on the impacts of fishing on the stock through AMPs or fishery plans.
- 7 Northern Inshore notes that there appears to be strong concern that a TACC increase would result in an increase in set net activity on northern reefs. The Company states that industry's intent is to develop the fishery through longline and trawl methods over existing grounds. As such, the Company considers it unlikely there would be a significant increase in set net activity on reefs as a result of the introduction of this species into the QMS.
- 8 Northern Inshore disputes the selection of commercial catch years (for TAC/TACC setting) for the averaging of current catch. The Company also questions why catch data from the 2002–03 fishing year have not been included in the consideration of catch history as with parore and porae. The Company states that data provided by MFish give the catch for RSN 1 in 2002–03 as 11.8 tonnes and for RSN 2 as 41.2 tonnes.
- 9 Based on the commercial catch history for RSN 1, Northern Inshore considers that there was a significant shift in average catch history from 1995–96 onwards as the fishery began development. Northern Inshore believes that the period 1995 to 2002 is more representative of current catch levels and should be used for setting the TACC. The average of this period is 135 tonnes and the TAC and other allocations should be adjusted accordingly.
- 10 For RSN 2, Northern Inshore considers that there has been a similar significant shift since 1996 followed by a further increase in 1999 as the fishery started development. The Company believes that a more accurate estimate of recent catch history is derived by averaging the fishing years from 1999 to 2002. On this basis, Northern Inshore believes the RSN 2 TACC should be a minimum of 40 tonnes rather than 19 tonnes, and that the TAC and other allocations should be adjusted accordingly.
- 11 TOKM notes that red snapper is a bycatch species and would expect a similar approach to TAC setting as has been followed for similar bycatch species such as Ray's Bream. This would entail averaging the commercial catch over the previous five years, with appropriate allowances. TOKM also sees no reason to make any particular allowances for FMA 10, or to depart from the practice, followed since the QMS commenced in 1986, of setting the TAC/TACC at 10 tonnes for FMA 10. Therefore, TOKM considers the relevant numbers should be:

¹ Regulation 20E of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986, Amendment No. 7 SR 1993/279) prohibited the sale of 19 reef fish species: red moki, painted moki, red pigfish, Sandager's parrotfish, scarlet parrotfish, banded parrotfish, green parrotfish, giant boarfish, long-finned boarfish, marblefish, notch-headed marblefish, kelpfish (hiwihiwi), silver drummer, butterfly perch, splendid perch, toadstool groper, rock cod, red mullet (goatfish) and black angelfish.

- RSN 1: 146t TAC; 13t recreational, 2t customary, 1t other, 130t TACC
 - RSN 2: 34t TAC; 2t recreational, 1t customary, 1t other, 30t TACC
 - RSN 10: 10t TAC; 0t recreational, 0t customary, 0t other, 10t TACC
- 12 The Northland Conservation Board is aware of the disappearance of large schools of mature red snapper (30 cm+) that could be observed in the early–mid 1970’s at SCUBA diving depths around the Poor Knights Islands, particularly in the large underwater caves and arches. For many years, possibly since the early–mid 1980’s, the Board considers that the caves and arches have been almost completely lacking in these schools and only inhabited by small groups, if any, of red snapper. The Board is also aware that recreational catches of red snapper from deep reefs in the vicinity of the Poor Knights Islands are frequently of small fish less than 30 cm in length.
- 13 The Board considers that these observations and much other anecdotal evidence suggest a serious decline in both stock size and average fish size at diveable depths and on recreationally fished deep reefs in the vicinity of the Poor Knights Islands Marine Reserve. In view of the fact that the fish appear to be long-lived, and hence perhaps slow-growing, these observations and anecdotes give the Board cause for alarm at the status and sustainability of the species. Accordingly, the Board considers that red snapper should not be a target commercial fishery. The Board believes that the TACC should reflect the bycatch only, and the current suggested TACC should be reduced by what MFish considers the target catch to be.

MFish Discussion

- 14 MFish agrees that now that the 2002–03 catch data² have become available for red snapper that this information should be used in the catch period for setting the TACs/TACCs. Accordingly, the catch period years for red snapper are now 1993–94 to 2002–03. This results in a 1 tonne decrease to the proposed TACC for RSN 1 (124 tonnes now recommended) and a 2 tonne increase to the proposed TACC for RSN 2 (21 tonnes now recommended).
- 15 In the IPP (paragraph 10), MFish explained that it would not be appropriate to provide an opportunity for development for red snapper by setting a TAC above the level of the average catch. This was due to the lack of information on the relationship of the current biomass to B_{MSY} , the potential risk associated with the biology of the species, and the anecdotal concerns of recreational and environmental groups. For these reasons, MFish also considers it would not be appropriate at this stage to consider red snapper under the AMP framework. However, if better information becomes available about red snapper, then it may be possible to consider this species under the AMP framework in the future.
- 16 Regarding TOKM’s concerns about QMA 10, MFish notes that a range of criteria and fishing years has been used on an individual species basis in recent years for determining the most appropriate tonnages for QMA 10. MFish does not consider that the 1986 practice of setting the TACC at 10 tonnes is now relevant for QMA 10. This is mainly because most of the area within 12 nautical miles of the Kermadec Islands is now a marine reserve (gazetted in the early 1990’s) with all fishing prohibited.

² The catch from the landing section of the CELRs and CLRs for 2002–03 was: 117.6t RSN 1; 41.1t RSN 2.

Social, Cultural and Economic Factors

- 17 The submissions received did not raise any issues concerning social, cultural and economic factors for red snapper as considered in the IPP.

Environmental Considerations

- 18 The submissions received did not raise any issues concerning environmental considerations for red snapper as considered in the IPP.

Other Management Measures

Submissions

- 19 Northern Inshore endorses the inclusion of red snapper in the combined multi-species bag limit set at 20 finfish per day. TOKM supports the inclusion of red snapper in the relevant combined species bag limits for amateur fishers.
- 20 The Northland Conservation Board considers that a size limit should be established for customary and recreational fish based on “size at maturity”. The Board is aware that red snapper are usually caught at depth by line and hook and the chances of survival of released undersized fish may be very low. However, the Board considers a size limit may encourage fishers to avoid known areas of undersized fish - publicity and information pamphlets could explain this principle. The Board also strongly supports the proposed daily bag limit, and suggests that a five fish per day sub-limit should apply within the 20 finfish per day limit.

MFish Discussion

- 21 As proposed in the IPP and supported by the three submissions, MFish recommends for the Auckland and Kermadec Area, and Central Area, that red snapper should be included in the combined multi-species bag limit set at 20 finfish per amateur fisher per day for each regulatory area. MFish does not consider that a sub-limit should be set for red snapper within the 20 finfish limit (as suggested by the Northland Conservation Board) as sub-limits are generally only used for species with a definite sustainability concern (eg. snapper, blue cod) to constrain the recreational catch.
- 22 MFish does not consider a size limit would be appropriate as most red snapper caught by recreational fishers are likely to have been caught in waters deeper than 20 metres. The survival rate of undersize red snapper caught from these depths is likely to be low. MFish has produced publicity pamphlets on ways to avoid catching and how to release undersize snapper. However, there is probably not much merit in a publicity pamphlet (as suggested by the Northland Conservation Board) on avoiding or releasing undersize red snapper as MFish considers that most red snapper are probably caught as a bycatch of attempting to target other deeper water species.

Deemed values and overfishing thresholds

Submissions

- 23 Northern Inshore questions the inclusion of red snapper in the “all other fishstocks” category for deemed values on the basis that it is inconsistent with the decisions for setting deemed values for parore and porae. Northern Inshore believes that red snapper should be included in the low knowledge fishstock category.

Discussion

- 24 MFish considers it would not be appropriate to classify red snapper as a low knowledge fishstock as one of the criteria for this category is that there must be no sustainability concerns about the stock. This is not the situation for red snapper as there has been a high level of concern from the non-commercial sector about the sustainability of this fishery based on anecdotal information. In contrast, MFish is not aware of any significant level of concern about the sustainability of porae and parore.

Conclusion

- 25 Red snapper is to be introduced into the QMS on 1 October 2004 as three fishstocks: RSN 1, RSN 2, and RSN 10. Red snapper is primarily taken as a bycatch in trawl and longline fisheries targeting other species. No stock assessment information is available for red snapper. There are no estimates of reference or current biomass in relation to MSY. Accordingly, it is not known whether the red snapper stocks are at, above, or below a level that can produce MSY.
- 26 There is no stock assessment information to suggest a sustainability concern at current catch levels for red snapper. However, the biological and ecological characteristics of red snapper as a reef fish may make it susceptible to overfishing. MFish is aware of the anecdotal concerns from environmental and recreational fishing groups about the sustainability of red snapper.
- 27 No quantitative estimates of the recreational catch or customary Maori catch are available. Based on MFish’s general understanding of the non-commercial fishery (outlined in the IPP), MFish considers that the recreational red snapper catch is likely to be around 10% of the TACC, with the customary catch at around 15% of the recreational catch; this contributes to the non-commercial allowances of 1–13 tonnes. MFish recommends a nominal allowance of 1 tonne for other sources of fishing-related mortality for each of the red snapper stocks. Due to comments in submissions, the catch period years were changed to include the 2002–03 fishing year, resulting in the recommended TACCs at 1–124 tonnes.
- 28 Since red snapper is primarily a commercial fishery, the recommended TACs (4–140 tonnes) were based mainly on the reported commercial catch. MFish is satisfied that these catch levels will ensure that the red snapper stocks are maintained at or above a level that can produce the maximum sustainable level.

Final Recommendations

29 MFish recommends that you:

- a) **Agree** to set a TAC for RSN 1 of 140 tonnes, and within that TAC:
 - i) **Agree** to set a Maori customary allowance of 2 tonnes;
 - ii) **Agree** to set a recreational allowance of 13 tonnes;
 - iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality; and
 - iv) **Agree** to set a TACC of 124 tonnes.
- b) **Agree** to set a TAC for RSN 2 of 25 tonnes, and within that TAC:
 - i) **Agree** to set a Maori customary allowance of 1 tonne;
 - ii) **Agree** to set a recreational allowance of 2 tonnes;
 - iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality; and
 - iv) **Agree** to set a TACC of 21 tonnes.
- c) **Agree** to set a TAC for RSN 10 of 4 tonnes, and within that TAC:
 - i) **Agree** to set a Maori customary allowance of 1 tonne;
 - ii) **Agree** to set a recreational allowance of 1 tonne;
 - iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality; and
 - iv) **Agree** to set a TACC of 1 tonne.
- d) **Agree** to include red snapper as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986;
- e) **Agree** to include red snapper as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Fishing Area Amateur Fishing) Regulations 1986;
- f) **Agree** to set an annual deemed value for all the red snapper stocks at \$4.09 per kg;
- g) **Agree** that a differential deemed value applies; and
- h) **Agree** that the reporting regulations be amended to reflect the new fishstock codes for red snapper stocks.

SOUTHERN BLUEFIN TUNA (STN) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Southern bluefin tuna (*Thunnus maccoyii*) has been gazetted for introduction into the QMS on 1 October 2004. The Quota Management Area (QMA) for southern bluefin tuna includes all New Zealand fisheries waters and the high seas. The fishing year for southern bluefin tuna will be from 1 October to 30 September in the following year and the total allowable commercial catch (TACC) and annual catch entitlement (ACE) are to be expressed in terms of kilograms greenweight.

Key issues to be considered

- 2 Key factors/issues related to the decisions on sustainability and other management controls for southern bluefin tuna are as follows:
 - a) Southern bluefin tuna is subject to a catch limit (420 tonnes) that is set under the auspices of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT);
 - b) Under the Convention for the Conservation of Southern Bluefin Tuna the catch limit is intended to cover all fishing-related mortality;
 - c) The QMA for southern bluefin tuna includes the high seas because the obligation under the Convention for the Conservation of Southern Bluefin Tuna is to count all catch by New Zealand nationals against the New Zealand catch limit;
 - d) Standard practice for CCSBT member states is to ensure catches by their nationals do not exceed the respective annual catch limits;
 - e) Past practise has been for New Zealand to account for annual over catch of southern bluefin tuna by reducing the catch limit for the following fishing year. This practise will continue until such time as alternative over and under catch provisions are agreed by CCSBT, however within the QMS there may be a one year time lag in implementing any reduction;
 - f) The proposals for TAC, allowances and TACC in this initial position paper presuppose that there is no over catch of the New Zealand annual catch limit in the 2003-04 fishing year (the last year of competitive fishing);
 - g) There is the potential for the availability of ACE for southern bluefin tuna to limit the development of the fishery for bigeye tuna unless southern bluefin tuna ACE is retained for bycatch;
 - h) Southern bluefin tuna is a high value species and the value varies substantially based on the condition of the fish; and
 - i) There are no estimates of non-commercial take, but southern bluefin tuna is an occasional and highly prized catch in the recreational gamefish fishery.

List of management options

- 3 To add southern bluefin tuna to the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
- 4 The proposed options for a total allowable catch (TAC), TACC and allowances for southern bluefin tuna are as follows:

Table 1: Proposed TAC, TACC, and allowances for southern bluefin tuna (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
STN 1	420	1	4	2	413

- 5 Strong incentives (high deemed value of \$43.82 per greenweight kg and the application of differential deemed values) are proposed to encourage fishers to constrain catch to their available ACE.
- 6 The carry forward of under fishing rights as provided for in s 67A of the Fisheries Act 1996 is not considered to be a viable option for southern bluefin tuna because of the obligation to maintain the integrity of the catch limit annually and it is therefore proposed to list this species on Schedule 5A of the 1996 Act.
- 7 As a further tool to maintain the annual integrity of the catch limit and to provide flexibility to fishers in managing catch against ACE it is proposed to list southern bluefin tuna on the Sixth schedule of the 1996 Act to allow the release of southern bluefin tuna subject to the condition that they are alive and likely to survive.
- 8 The Fisheries (Southern Bluefin Tuna Quota) Regulations become redundant once southern bluefin tuna enter the QMS and it is proposed that they are revoked. The requirements of regulation 8 of those regulations (to report catch taken on the high seas) will be incorporated into Fisheries (Reporting) Regulations 2001 (the Reporting Regulations) and the Fisheries (Recordkeeping) Regulations 1990.
- 9 Consequential amendments to the Reporting Regulations are proposed.
- 10 Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001 requiring application for the registration of foreign-owned fishing vessels six weeks prior to the commencement of the fishing year becomes redundant once southern bluefin tuna enter the QMS and it is proposed that this regulation be revoked.

TAC

TAC management strategy

- 11 It is proposed that southern bluefin tuna are listed on the Third Schedule and a TAC for southern bluefin tuna is set under s 14 of the 1996 Act. This section provides for the setting of alternative TACs for stocks specified in the Third Schedule if the Minister is satisfied that the purpose of the 1996 Act can be better achieved otherwise than by setting a TAC in accordance with the provision of s 13(2).

- 12 One of the criteria for inclusion of stocks on the Third Schedule is that a catch limit for New Zealand has been determined as part of an international agreement. This is the case for southern bluefin tuna and MFish considers that the purpose of the 1996 Act can be better achieved by using this agreed limit as the TAC.
- 13 Further, s 14(6) provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level. This is a mechanism that can be used to implement any within fishing year decisions by CCSBT to increase the New Zealand catch limit (within fishing year reductions in TAC are not able to be implemented).
- 14 While not proposed at this stage, this mechanism may be required in the future if QMS management results in continued over catch of the TAC. Past practise has been that any over catch in one year is reduced from the catch limit in the following year. The change to QMS management will mean that there is potentially a one-year lag in implementing any reduction. It is not possible to reduce a TAC once a fishing year has commenced and it is also not possible to reconcile a complete fishing years catch until some time after the end of the fishing year. The alternative arrangement is the setting of a low TAC and annually setting a TAC pursuant to s 14(6) based on the catch in the previous fishing year.

Rationale for proposed TACs

- 15 Southern bluefin tuna is subject to catch limits set under the auspices of the CCSBT, of which New Zealand is a member.
- 16 The obligation under the Convention for the Conservation of Southern Bluefin Tuna is to include all mortality caused by fishing within the national allocation of member states. MFish considers that the current New Zealand national allocation for southern bluefin tuna (420 tonnes) should be the TAC.
- 17 Past practise has been to apply the New Zealand national allocation only to the commercial component of the catch. However, the introduction of southern bluefin tuna into the QMS requires explicit allowances to be set for non-commercial use and for other sources of fishing-related mortality.
- 18 The issue of non-commercial catch and how it should be treated in relation to national allocations is likely to be on the agenda for CCSBT in October 2004. In this context New Zealand will be seeking an increase in national allocation more generally and specifically in relation to making provision for non-commercial catch. However, until there is an agreed outcome from CCSBT to an alternative position, MFish considers that the default of the national allocation equating to the TAC applies. Should a new agreement be reached in October 2004 an in-season adjustment to the TAC can be considered prior to the commencement of the first season (around March 2005) of fishing for southern bluefin tuna within the QMS.

STN 1

- 19 A TAC of 420 tonnes is proposed.

Proposed allowances and TACC

Customary Māori and recreational allowances

- 20 There are no estimates of the non-commercial catch of southern bluefin tuna. Southern bluefin tuna is caught by recreational fishers and is highly prized by gamefishers in areas such as the Bay of Plenty and Hawkes Bay. Historically southern bluefin tuna were also regularly caught by recreational fishers on the west coast of the north and south islands and in Fiordland. A recreational fishery of unknown size remains in these areas. In the absence of estimates of catch a nominal allowance of 4 tonnes for recreational fishing is proposed.
- 21 A nominal allowance for customary Māori fishing is also considered to be necessary given that southern bluefin tuna may have been of historical importance to customary fishers in some areas of New Zealand, MFish does not consider that customary use is likely to be at the level of the recreational catch given the distribution of southern bluefin tuna in New Zealand fisheries waters which is primarily well offshore and in more southern climes. A nominal allowance of 1 tonne is therefore proposed.

Allowances for other sources of mortality

- 22 It is likely that within the current management arrangements there is an unquantified level of fishing-related mortality on southern bluefin tuna. Once the season for this species has been closed, any southern bluefin tuna that is taken must be released to the sea. Some will not survive.
- 23 Under the QMS, MFish considers that this will change. Fishers will have incentives to optimise the quality and timing of their catch and the requirement to release fish at sea will be reduced. However, observer information is available from the 1990s that indicates a level of discarding of damaged fish and loss of fish prior to landing. While current information suggests that the level of southern bluefin tuna discards are low relative to other tuna species an allowance for other sources of mortality will be required. It will be unlawful to discard southern bluefin tuna once it is in the QMS (an exception will be release subject to conditions set down in the Sixth Schedule to the 1996 Act). Some discarding of damaged fish is anticipated given the likely high value of southern bluefin tuna annual catch entitlement and high deemed values proposed.
- 24 There is an observed discard of 1% of southern bluefin tuna of which 42% were damaged. There is an observed loss of 0.7% of southern bluefin tuna prior to landing a proportion of which is unlikely to survive. An estimate of mortality associated with the discard and loss of southern bluefin tuna is 0.5%¹. This equates to an allowance of 2 tonnes. This estimate has recently been updated and considered by the MFish Pelagic Stock Assessment Working Group. A revised estimate of 0.54% is now available for discard and loss of southern bluefin tuna, however this results in no change to the rounded estimate for an allowance for fishing related mortality, which remains at 2 tonnes for fish lost before they are landed.

¹ Southern bluefin tuna (STN) in Report from the Fishery Assessment Plenary, May 2003: stock assessments and yield estimates, Part 2: Orange Roughy to Yellow-eyed mullet. J Annala et al Comps and eds

TACC

- 25 Having allowed 5 tonnes for non-commercial use and 2 tonnes for other sources of fishing-related mortality, a TACC of 413 tonnes is proposed to remain within the TAC of 420 tonnes.

Other management measures

Consequential amendment to regulations

- 26 As a consequence of the introduction of southern bluefin tuna into the QMS, MFish proposes to revoke:
- The Fisheries (Southern Bluefin Tuna Quota) Regulations 2000; and
 - Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001.
- 27 In addition, MFish proposes to introduce a number of amendments to the Reporting Regulations (including the inclusion of regulation 8 from the Fisheries (Southern Bluefin Tuna Quota) Regulations) to ensure the efficient and effective operation of the QMS. Details of the proposed amendments are attached as Annex One to this section. Details on proposed amendments to the Fisheries (Reporting) Regulations to specify the codes to be used when completing catch returns are set out in a generic section of this document.

Schedule 5A: under-fishing provisions

- 28 MFish proposes to list southern bluefin tuna on Schedule 5A of the 1996 Act which would prohibit the carry forward of under-fishing rights.
- 29 Where commercial fishers are unable to land their full entitlement within a fishing year, the Act provides for the carry-forward of the lesser amount calculated under s 67A(2)(a) or 10% of the ACE that a commercial fisher holds at the end of the fishing year, to be fished in the subsequent fishing year. Therefore, under-fishing rights can accrue at the end of a fishing year and apply for fishing against ACE in the following fishing year. MFish considers that it is not possible to exercise this degree of flexibility in the context of managing to an internationally agreed catch limit. Accordingly, MFish proposes the addition of southern bluefin tuna to Schedule 5A to prevent the use of the carry-forward of ACE provision.

Deemed values and overfishing thresholds

- 30 A separate section of this document sets out generic information on the setting of interim and annual deemed values.
- 31 Southern bluefin tuna is a high value species subject to an internationally agreed catch limit. Past practise has been to adjust for any over-catch in one fishing year by reducing the commercial catch limit for the following fishing year. In this context strong incentives are required to avoid fishers catching and landing southern bluefin tuna other than under the authority of ACE.
- 32 Southern bluefin tuna best fits in the high value single species fishstock category, for which the annual deemed value should be set at twice the port price. The port price for southern bluefin tuna is \$21.91 per greenweight kg (MFish early 2003 port price survey). MFish therefore proposes an annual deemed value of \$43.82 per kg for southern bluefin tuna.

- 33 The alternative is the category of “all other stocks” for which the deemed value would be 75% of port price (\$16.43 in the case of southern bluefin tuna). New Zealand is bound to maintain the integrity of the national allocation for southern bluefin tuna on an annual basis until such time as the CCSBT agrees a more flexible approach to the annual management of catch limits. Southern bluefin tuna in peak condition can realise in excess of \$36.00 per kg. The “all other stocks” category results in a deemed value that will not provide sufficient incentive to fishers not to land southern bluefin tuna without ACE.
- 34 To ensure that actions of individuals do not prejudice the collective interests of southern bluefin tuna quota holders, a high deemed value is the preferred option.
- 35 MFish proposes to set differential deemed values for southern bluefin tuna. MFish does not propose to set an overfishing threshold for southern bluefin tuna, unless monitoring of catch against TACC suggests this is required in the future. The effect of an overfishing threshold once triggered would be to exclude the fisher concerned from any fishery within New Zealand fisheries waters and the high seas.

Inclusion of southern bluefin tuna on the Third Schedule

- 36 MFish proposes that southern bluefin tuna be added to the Third Schedule of the 1996 Act to allow the TAC for southern bluefin tuna to be set pursuant to s 14. Section 14 of the 1996 Act provides for the setting of an alternative TAC (in the situation that an internationally agreed catch limit has been set) where the Minister is satisfied that the purpose of the 1996 Act is better achieved than by setting a TAC otherwise than in accordance with s 13(2).

Sixth schedule

- 37 It is also proposed (refer Annex One) that southern bluefin tuna is listed on the Sixth Schedule of the 1996 Act to allow the release of live southern bluefin tuna if fishers are not able to cover catch with ACE. This provision will mitigate the punitive aspect of high deemed values in cases of genuine, unavoidable bycatch. However, if fish are unlikely to survive fishers will be required to land them and pay deemed values if they are unable to acquire ACE.

Statutory considerations

- 38 MFish considers that the requirements of s 5 (Application of international obligations and Treaty of Waitangi (Fisheries Claim) Settlement Act 1992) of the 1996 Act are met. The proposal to set a TAC for southern bluefin tuna at the level of the internationally agreed catch limit for New Zealand is considered to be consistent with New Zealand’s international obligations in relation to fishing. This and other measures are also considered to be consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.
- 39 The fishery for southern bluefin tuna is a seasonal target fishery. It is likely that within a QMS management regime the pattern of the fishery will change. Quota for southern bluefin tuna is likely to be retained to cover the bycatch of fishing for bigeye tuna and become more part of a tuna longline mix of species.

- 40 A wide range of fish species are taken as bycatch of tuna longline fishing. Catch levels vary but many of these species are only rarely taken. The main fish bycatch species associated with the surface longline fishery within the EEZ are to be introduced into the QMS. This will provide the mechanisms for sustainability actions as required.
- 41 There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of southern bluefin tuna into the QMS will improve our ability to address these issues by requiring the inclusion of new information as it comes to hand in the catch limit setting process. Accordingly, MFish considers that the environmental principles set out in s 9 of the Act are met within the limited information available.
- 42 There are potential effects of tuna longline fishing on the aquatic environment (seabirds) but steps have been and continue to be taken to mitigate these risks. Existing controls that apply to the area of the southern bluefin tuna fishery are outlined in Annex Two. Recruitment of southern bluefin tuna is known to be variable at the current low levels of stock biomass. This feature is taken into account in international assessments and the setting of national catch limits for member states.
- 43 Before setting any sustainability measure under Part III of the Act, the Minister must have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, and any management strategy or management plan under the Conservation Act 1987 that applies to the coastal marine area and is considered to be relevant by the Minister. MFish is not aware of any provisions in any strategy or planning document under the Resource Management Act or Conservation Act that are relevant to the setting of sustainability measures for southern bluefin tuna.
- 44 Similarly, before setting any sustainability measure relevant to the Hauraki Gulf (eg, a TAC for the southern bluefin tuna), the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000 Act. The Hauraki Gulf is defined in that Act to include all coastal waters and offshore islands from near Te Arai Point offshore to the Moko Hinau Islands, and south to Homunga Point (north of Waihi Beach). This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. While southern bluefin tuna are not known to occur within the boundaries of the Hauraki Gulf, MFish considers that the setting of sustainability measures for southern bluefin tuna will better meet the purpose of the Act.
- 45 Before setting any sustainability measure, the Minister must also take into account any conservation services or fisheries services, any relevant fisheries plan approved under the Act, and any decisions not to require conservation services or fisheries services. There are no relevant fisheries plans approved that would have any bearing on the setting of a TAC for southern bluefin tuna. Conservation and fisheries services apply to tuna fisheries generally in order to assess and monitor the impacts of fishing on non target fish and non-fish species.
- 46 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaītai reserves exist within

STN 1 the values of the mātaimai will not be compromised as southern bluefin tuna are an oceanic stock. No area has been closed or fishing method restricted for customary fishing purposes in STN 1 that would affect the fishery. No restrictions have been placed on fishing in any area within the STN 1 for recreational interests.

- 47 The information used to develop proposals for southern bluefin tuna relies on overseas assessments of the stock. There is uncertainty in these assessments, however, a research programme is in train to address key areas of uncertainty. New Zealand is participating in this research. CCSBT is also considering the implementation of management procedures to determine management responses to future assessments of the stock and has an active programme to ensure that southern bluefin tuna fishing nations participate in regional management controls.
- 48 The level of non-commercial catch within New Zealand fisheries waters is uncertain with regard to setting allowances for recreational, customary Māori use and other sources of fishing-related mortality. MFish notes, however, that uncertainty in information is not a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act (s 10 Information Principles).

Preliminary recommendations

- 49 MFish recommends that the Minister:
- a) **Agrees** that the purpose of the 1996 Act is better achieved by setting a TAC for southern bluefin tuna otherwise than in accordance with s 13(2) of the 1996 Act.
 - b) **Agrees** to add southern bluefin tuna to the Third Schedule and set a TAC pursuant to s14 of the 1996 Act.
 - c) **Agrees** to set a TAC for southern bluefin tuna of 420 tonnes and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 4 tonnes;
 - iii) An allowance of 2 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 413 tonnes.
 - d) **Agrees** to set a deemed value for southern bluefin tuna of \$ 43.82 per kg.
 - e) **Agrees** to list southern bluefin tuna on the Sixth Schedule of the 1996 Act.
 - f) **Agrees** to list southern bluefin tuna on Schedule 5A of the 1996 Act.
 - g) **Agrees** to revoke the Fisheries (Southern Bluefin Tuna Quota) Regulations 2000.
 - h) **Agrees** to revoke regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001.
 - i) **Agrees** to consequential amendment to the Fisheries (Reporting) Regulations 2001 including the insertion of requirements to report catch taken on the high seas.

ANNEX ONE

Amendment to regulations

Sixth Schedule: return of southern bluefin tuna to the water

Background

- 50 New Zealand has an annual catch limit for southern bluefin tuna determined under the auspices of CCSBT. New Zealand is required to account to the CCSBT for its performance in relation to this catch limit. Past practise has been that any overcatch in one year is deducted from the next fishing year.
- 51 Southern bluefin tuna is currently managed as a competitive fishery. Once the Chief Executive has determined that the catch limit has been or is likely to be reached the fishery is closed. Any southern bluefin tuna caught after the closure must be returned to the sea whether alive or dead.

Problem definition

- 52 The introduction of southern bluefin tuna to the QMS will change the management rules for this fishery. As a quota species any southern bluefin tuna that is caught must be retained and landed. With the new QMS management arrangements it will not be possible to reduce the TAC in the fishing year directly following an overcatch. The time lag between receiving the information from a full years catch and making an adjustment to the TAC to take effect at the commencement of the next fishing year will mean a time lag of one year.
- 53 Incentives will operate to try and ensure that catch is matched to ACE however there is no requirement in domestic legislation for TACs/TACCs to be adjusted if they are overcaught in any given fishing year. Southern bluefin tuna will be the first instance in which there is an international obligation not to exceed the TAC. Fishers who deliberately or inadvertently exceed their ACE will impose a penalty on the collective interests of quota holders by causing a reduction in catch limit in the following year.
- 54 Southern bluefin tuna is a highly valuable species and it is to be expected that most ACE holders will try and fully catch their allocation in any given fishing year. There is likely to be a high cost to ACE and the deemed values proposed are also high. There will be a punitive effect for fishers who inadvertently exceed their ACE because of the imprecise nature of target fishing for tuna species at certain times of year.

Proposal

- 55 Southern bluefin tuna could be placed on the Sixth Schedule of the 1996 Act to provide fishers some flexibility to control landed catch. The Sixth Schedule provides a means for a commercial fisher to return fish to the water subject to stated requirements set out for that stock. The conditions proposed are that the return to the sea is immediate and that the fish returned are likely to survive.

Options

- 56 The alternative option is to rely on the incentives within the QMS to ensure that catch and ACE are matched on an annual basis.

Costs and benefits of the proposal

- 57 There will be a clear benefit to fishers wishing to target other tuna species to have some flexibility with respect to inadvertent catch of southern bluefin tuna. Deemed value payments are avoided. There are also benefits that fish of lower size and value can be released if alive and the value of the catch optimised.
- 58 If this provision along with other incentives of the QMS results in a balance between catch and the TAC on an annual basis, there are administrative benefits (annual adjustments in TAC are avoided) and New Zealand also complies with its international obligations.
- 59 MFish assesses that southern bluefin tuna is a robust species that is often brought to the fishing vessel alive and can survive release to the water in most instances after capture by longline. The New Zealand obligation to the catch limit is to match fishing-related mortalities to the national allocation. Fish taken and released alive do not count against the national allocation.
- 60 There is some risk that fishers do not comply with the requirement that only live fish are returned. This risk (high grading or discarding) is the same whether Sixth Schedule provisions are available or not, particularly given the significant variation in value associated with fish condition and to a degree size.

Administrative implications

- 61 There are no specific administrative implications associated with this proposal other than those associated with its implementation.

Redundant catch limit regulations

Background

- 62 The Fisheries (Southern Bluefin Tuna Quota) Regulations 2000 give effect to the decisions of the CCSBT and set a catch limit for southern bluefin tuna, provide for the closure of the fishery, reporting of southern bluefin tuna catch taken on the high seas and offences. These regulations become redundant once southern bluefin tuna are introduced into the QMS.

Problem definition

- 63 Regulations to set a catch limit and to provide for a closure of the southern bluefin tuna fishery once the catch limit has been reached will no longer be required once southern bluefin tuna are in the QMS. However, regulation 8 of these regulations provides for the reporting of southern bluefin tuna taken by New Zealand citizens on the high seas. This reporting regulation will still be required under the QMS regime. Accordingly, an equivalent regulation will be required to be inserted into the Fisheries (Reporting) Regulations 2001 and the Fisheries (Recordkeeping) Regulations 1990.

Preliminary consultation

- 64 No direct consultation has been undertaken on the revocation of these regulations as this is a consequential amendment flowing from the Minister's decision to introduce southern bluefin tuna into the QMS.

Options

- 65 There are no alternative options.

Costs and benefits of the proposal

- 66 The costs and benefits are those associated with the move from a competitive fishing regime with its associated inefficiencies to a QMS regime where fishers are able to optimise their catch in accordance with the objectives of the Convention for the Conservation of Southern bluefin tuna

Administrative implications

- 67 There are no administrative implications other than the requirement to retain provisions of these regulations that require reporting of any high seas catch of southern bluefin tuna.

Consequential amendment to Fisheries (Commercial Fishing) Regulations 2001: redundant charter vessel regulations

Background

- 68 Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001 applies only to foreign owned New Zealand fishing vessels and requires that any operator, notified user or master of a vessel used for southern bluefin tuna longlining must apply for approval to register the vessel not less than six weeks before the start of each fishing year.

Problem definition

- 69 Once southern bluefin tuna is introduced into the QMS the competitive effects in the fishery are eliminated and the rationale for the regulations ceases to exist. Its retention would create inefficiencies in the fishery for those that wish to use foreign-owned vessels to take their ACE.

Preliminary consultation

- 70 There has been no preliminary consultation on the proposal. Rather the proposed revocation is consequential to the decision to introduce southern bluefin tuna into the QMS.

Options

- 71 There are no alternative options other than retention of the regulation.

Costs and benefits of the proposal

- 72 There are clear benefits to industry in having access to foreign-owned vessels at any stage of the fishing year. There are no identifiable costs associated with the proposal. There is

some risk of conflict between operators of foreign and domestically owned vessels. These are matters for resolution within an industry code of conduct.

Administrative implications

- 73 There are no administrative implications associated with revoking the regulation. The administration of the registration of foreign owned vessels will come into line with those used for other QMS species.

Consequential Amendments to the Fisheries (Recordkeeping) Regulations 1990

Background

- 74 Consequential amendments to the Fisheries (Recordkeeping) Regulations 1990 to ensure that they apply to the catch of southern bluefin tuna taken by any New Zealand citizen or any New Zealand fishing vessel on the high seas (and licensed fish receivers and dealers in fish make records in accordance with those regulations) are proposed.

Problem definition

- 75 The obligation for catch on the high seas to be recorded is contained in regulation 8 of the Fisheries (Southern Bluefin Tuna Quota) Regulations 2000. It is proposed that these regulations are revoked, as they become redundant once southern bluefin tuna enters the QMS, but there is a need to save the requirement to keep records of the catch of southern bluefin tuna taken on the high seas.

Preliminary consultation

- 76 No direct consultation on the need to amend these regulations has been undertaken as it is a consequential amendment flowing from the Minister's decision to introduce southern bluefin tuna into the QMS.

Options

- 77 As the recordkeeping framework is contained in regulations, there is no other option than to amend these regulations.

Costs and benefits of the proposal

- 78 The proposed amendments clarify the obligations for licensed fish receivers when completing their statutory returns. Regulatory clarification means licensed fish receivers are aware of their reporting obligations and complete their returns in the simplest fashion possible.

Administrative implications

- 79 Minor amendments to forms and explanatory notes will be required consequential to this regulatory amendment.

ANNEX TWO

Species information

Species biology

- 80 Southern bluefin tuna comprises a single stock occurring primarily between 30°S - 50°S in the South Atlantic, Indian and southwest Pacific Oceans. This species spawns in late spring and summer months in the southeast Indian Ocean and south of Java.
- 81 Southern bluefin tuna reach a maximum reported size of 225 cm fork length and 200kg. They mature between eight and 12 years and may reach 30 years of age. Current information suggests that the growth rate of southern bluefin tuna has changed during the course of the fishery².

Fisheries characteristics

Commercial catch

- 82 Since the start of the domestic fishery, handline, trolling and longline methods have been used to target southern bluefin tuna in New Zealand fisheries waters. In recent years nearly all of the southern bluefin tuna catch has been by surface longline with small catches by trolling. Table 1 gives the estimated southern bluefin tuna catch by gear type since 1990. The domestic fishery is composed of a wide range of vessel types including many small owner-operated boats and four to five Japanese distant water longliners chartered by a New Zealand company. Both the chartered vessels and the New Zealand owner-operated vessels have fished competitively against New Zealand's southern bluefin tuna catch allocation.
- 83 Total domestic longline effort, measured in millions of hooks, has increased exponentially since the early 1990s. The increase in effort is attributable to the growing number of New Zealand owned and operated longliners that primarily target bigeye tuna. In contrast, the longline effort targeting southern bluefin tuna has been stable since 1989 (average = 1.4 million hooks per year). The total number of longline hooks set each year is now slightly more than 10 million. Sets targeting southern bluefin tuna account for about 20% of all longline effort.

² Southern bluefin tuna (STN) in Report from the Fishery Assessment Plenary, May 2003: stock assessments and yield estimates, Part 2: Orange Roughy to Yellow-eyed mullet. J Annala et al Comps and eds.

Table 1: Summary of SBT catch (tonnes) by method since 1990, estimated catches are scaled to Licensed Fish Receiver landing reports to reflect total landings.

Year	Troll	Longline	Misc.	Total
1990	49.3	314.7	165.2	529.2
1991	8.6	149.7	6.2	164.5
1992	9.5	261.3	8.4	279.2
1993	0.0	215.0	1.7	216.6
1994	0.4	276.1	0.5	277.0
1995	4.2	429.6	2.6	436.4
1996	2.0	136.8	0.4	139.3
1997	2.2	329.6	1.8	333.7
1998	6.8	328.7	1.6	337.1
1999	2.2	456.8	1.7	460.6
2000	0.7	379.6	0.0	380.3
2001	0.2	358.3	0.0	358.5
2002	0.7	449.6	0.0	450.3

Recreational and customary catch

- 84 There are no estimates of recreational or Māori customary catch of southern bluefin tuna.

Regulatory framework

- 85 The Fisheries (Southern Bluefin Tuna) Regulations 2000 provide a regulatory framework for the management of the competitive fishery for southern bluefin tuna within the annual catch limit. These regulations will no longer be required when southern bluefin tuna is introduced into the QMS.
- 86 There are regulations relating to the application for the use of foreign owned vessel to take southern bluefin tuna (proposed for revocation when southern bluefin tuna enters the QMS) and there are specific reporting requirements for this species. Regulations apply to the method (minimum standards for seabird mitigation) and specific and general regulations apply if foreign-owned fishing vessels are operated in the tuna longline fishery (Part 2 of the Fisheries (Commercial Fishing) Regulations 2000).

Fisheries assessment

- 87 A scientific committee of CCSBT assesses the status of the southern bluefin tuna stock routinely. The CCSBT aims to return the stock to 1980 biomass levels by 2020. However, for the last two years the CCSBT Scientific Committee has advised that at current catch levels, there is little chance of achieving this aim and that the probability of the spawning stock being larger in 2020 than it is today is 50%, with an equal probability the stock will be smaller in 2020. Thus, serious concerns about the sustainability of this fishery remain.
- 88 Scientists assessing the stock agree that it has been overexploited, that the continued low abundance of the southern bluefin parental biomass is cause for serious concern, and that recent increases in fishing-related mortality for juvenile fish will lead to lower recruitment from these cohorts to the parental biomass. The World Conservation Union listed southern bluefin tuna as critically endangered in 1996.

Associated fisheries

- 89 In New Zealand waters southern bluefin tuna is primarily taken by surface longline. It is a target species at certain times and in certain areas. In other areas and at other times it is a bycatch of tuna longline fishing for other tuna species such as bigeye and albacore. A wide range of fish species are taken as bycatch of surface longline fishing. Catch levels vary but many of these species are only rarely taken. The main fish bycatch species associated with the surface longline fishery within the EEZ are to be introduced into the QMS. This will provide the mechanisms for sustainability actions as required.
- 90 There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species, however MFish notes that substantially higher levels of tuna longline fishing effort have been applied in the past by foreign licensed and charter fleets within New Zealand fisheries waters.
- 91 Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of southern bluefin tuna into the QMS will improve our ability to address these issues by requiring active consideration of any new information as it comes to hand in the catch limit setting process
- 92 In relation to southern bluefin tuna there is not considered to be any likely impact on associated bycatch fisheries at the catch limit proposed. There is some risk that southern bluefin tuna may limit the potential of fishers to target bigeye tuna at certain times of year. Fishers will need to consider how they balance the amount of ACE used in taking southern bluefin tuna as a target species as opposed to retaining ACE for bycatch.

Environmental issues

- 93 Environmental issues are common to the fishing method surface longlining rather than specific to fishing for southern bluefin tuna. There is a non-fish bycatch associated with the surface longline fishery. Fishing vessels sometimes capture seabirds that are chasing baited hooks, and the seabirds drown as the lines sink. Seabirds are also caught in trawl and other fisheries, but longliners are considered to be the main threat to several vulnerable albatrosses and other seabird species. The risks of seabird capture vary geographically and by species. An active programme is underway to mitigate and monitor the capture of seabirds in surface longline fisheries. In northern waters the potential for turtle bycatch will require monitoring and potentially mitigation.
- 94 MFish has established standard environmental controls on line and trawl target fisheries to mitigate the impact of these fishing methods on marine mammals and seabirds. These include prohibitions on net sonde monitor cables and compulsory reporting of bycatch of protected species. New Zealand surface longline vessels are required to use tori lines of a specified standard. Vessels are using a variety of practices to reduce seabird bycatch including the use of artificial baits and the practice of setting longlines at night.
- 95 MFish and the Department of Conservation are developing a National Plan of Action (NPOA) for Seabirds that is expected to include measures that will apply to all New Zealand fishing vessels.

- 96 Harvesting of southern bluefin tuna may affect predator/prey interactions and trophic dynamics, as southern bluefin tuna feeds on a wide range of fish species, crustaceans, and squid. In the Western Pacific, fish species consumed include anchovy, sardine, saury, mackerels and small tunas such as skipjack. Understanding of food web relationships is still at an early stage. MFish considers that, if evidence emerges of impacts on biodiversity from harvesting of southern bluefin tuna, this can be managed at that time, based on international cooperation where appropriate.

Current and potential research

- 97 Research is currently proposed as part of an international effort to resolve uncertainty in the distribution and movement of southern bluefin tuna. Southern bluefin tuna taken in New Zealand fisheries waters are to be tagged and released. Information on the New Zealand fishery (catch per unit of effort) is routinely contributed to the international process of assessment of the southern bluefin tuna stock. Information on the levels of non-commercial catch is uncertain. MFish will need to consider ways to reduce this uncertainty and/or monitor non-commercial catch of southern bluefin tuna.

Social cultural and economic factors

- 98 Southern bluefin tuna is a high value species that is one of the mainstays of the domestic tuna longline fishery in New Zealand. The QMS will allow fishers to fish for southern bluefin tuna in a way that optimises the value of the catch. It is in the national interest to actively participate in the international management arrangements for this species, which are targeted at rebuilding the fishery. As and when the stock increases the value of the fishery will increase through increased national allocations.
- 99 Though not a common catch of non-commercial fishers southern bluefin tuna is highly prized when caught.

SOUTHERN BLUEFIN TUNA - FINAL ADVICE

Initial proposals

- 1 MFish proposed to add southern bluefin tuna to the Third Schedule and set a TAC pursuant to s 14 of the Fisheries Act 1996 (the 1996 Act).
- 2 The proposed options for a total allowable catch (TAC), TACC and allowances for southern bluefin tuna were as follows:

Table 1: Proposed TAC, TACC, and allowances for southern bluefin tuna (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
STN 1	420	1	4	2	413

- 3 Strong incentives (high deemed value of \$43.82 per greenweight kg and the application of differential deemed values) were proposed to encourage fishers to constrain catch to their available ACE.
- 4 The carry forward of under fishing rights as provided for in section 67A of the Fisheries Act 1996 was not considered to be a viable option for southern bluefin tuna because of the obligation to maintain the integrity of the catch limit annually and it was, therefore, proposed to list this species on Schedule 5A of the 1996 Act.
- 5 As a further tool to maintain the annual integrity of the catch limit and to provide flexibility to fishers in managing catch against ACE it was proposed to list southern bluefin tuna on the Sixth schedule of the 1996 Act to allow the release of southern bluefin tuna subject to the condition that they are alive and likely to survive.
- 6 The Fisheries (Southern Bluefin Tuna Quota) Regulations become redundant once southern bluefin tuna enter the QMS and it was proposed that they are revoked. The requirements of regulation 8 of those regulations (to report catch taken on the high seas) will be incorporated into Fisheries (Reporting) Regulations 2001 (the Reporting Regulations) and the Fisheries (Recordkeeping) Regulations 1990.
- 7 Consequential amendments to the Reporting Regulations were proposed.
- 8 Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001 requiring application for the registration of foreign-owned fishing vessels six weeks prior to the commencement of the fishing year becomes redundant once southern bluefin tuna enter the QMS and it was proposed that this regulation be revoked.

Submissions

- 9 Submissions were received on the southern bluefin tuna proposals from the following submitters:
- **New Zealand Big Game Fishing Council (NZBGFC)**
 - **Seafood Industry Council (SeaFIC)**
 - **Sanford Limited (Sanford)**
 - **Te Ohu Kai Moana (TOKM)**
 - **Te Rūnanga o Ōtākou**
 - **Solander**
 - **Tuna Management Association of New Zealand (Inc)**
- 10 The specific submissions on the proposals for southern bluefin tuna are summarised and addressed under the relevant headings below.

Biological and Fishery Information

Submissions

- 11 The submissions received did not raise any issues concerning the biological or fishery information for southern bluefin tuna provided in the IPP.

MFish response

- 12 MFish confirms its views on the biological and fishery information for southern bluefin tuna provided in the IPP (refer para 80-92).

Environmental Considerations

Submissions

- 13 No submissions were received on the environmental considerations relating to the setting of sustainability measures for southern bluefin tuna outlined in the IPP.

MFish response

- 14 MFish confirms its views on the environmental considerations relating to the setting of sustainability measures for southern bluefin tuna outlined in the IPP (refer para 93-96).

TAC management strategy

Submissions

- 15 Subject to its reservations regarding the entry of highly migratory species into the QMS, **TOKM** agrees that no attempt should be made to “manage” the fish found seasonally in New Zealand waters under the provisions of s 13 of the Act. To that extent TOKM agrees with the proposal to include all HMS on the Third schedule and set TACs pursuant to s 14.

MFish response

- 16 MFish confirms its view that the purpose of the 1996 Act is better achieved by setting a TAC for southern bluefin tuna otherwise than in accordance with s 13(2) and that a TAC is set pursuant to s 14 of the 1996 Act.
- 17 MFish confirms its view that southern bluefin tuna should be added to the Third Schedule on the basis that an international catch limit has been set for this species. A recommendation to this effect is contained in separate advice.

TAC

Submissions

- 18 **TOKM** oppose the initial position and consider that as the national allocation was developed solely on the basis of commercial catches it should not be eroded for TACC purposes by removal of various allowances. TOKM proposes the TAC should be 427 tonnes.
- 19 **Solander** submit that all CCSBT members currently treat the national allocation as the TACC with no deductions for allowances. The proposal to reduce the TACC for southern bluefin tuna by 7 tonnes for allowances sets New Zealand apart from other members of the Commission.
- 20 Solander submits that while it understands (but does not accept) the rationale for setting a TACC with appropriate allowances it submits that strategically it is better to obtain New Zealand's increased in CCSBT allocation prior to making the deductions ourselves.
- 21 **Sanford Limited** strongly oppose the management proposal to include allowances for non-commercial fishing within the national allocation (set the national allocation as the TAC) on the basis that:
- It is outside the parameters of CCSBT to which New Zealand is a member
 - It is not consistent with other member countries
 - It unnecessarily reduces the TACC from the current 420 tonnes to 413 tonnes.
- 22 **SeaFIC** strongly disagrees with the proposed TAC of 420 tonnes and MFish's reasoning and interpretation of legislation to arrive at this. SeaFIC submit that principles of natural justice lead to the conclusion that as the national allocation was developed solely on the basis of commercial catches, the current allocation of 420 tonnes utilised by commercial fishers should not be eroded.
- 23 The **Tuna Management Association of New Zealand (Inc)** support the SeaFIC submission in regard to the introduction of the tuna species into the QMS.

MFish response

- 24 The MFish initial position was that the New Zealand national allocation for southern bluefin tuna of 420 tonnes becomes that TAC.

- 25 A New Zealand national allocation of southern bluefin tuna of 450 tonnes was first implemented for the 1988–89 fishing year, following agreement on catch limits for this species between Japan, Australia and New Zealand. This national allocation was reduced to 420 tonnes in the following year and has remained at that level since that time. The domestic fishery for southern bluefin tuna varied considerably during the 1980s and early 1990s. During the early 1980s most fishing for southern bluefin tuna was by handline with catches ranging from 59 to 305 tonnes. Longlining was introduced to the fishery (with Government encouragement) in the late 1980s and since 1991 surface longlines have been the predominant gear used in the fishery. Commercial catches during the 1990s ranged from 139 to 529 tonnes and have only been consistently at or near the national allocation since 1999.
- 26 It is therefore not entirely correct to suggest that the current national allocation has developed from the commercial fishery. In fact the catch limit was set in advance of the development of the fishery which has only relatively recently reached the stage where it can be said that the catch limit has acted as a constraint.
- 27 MFish acknowledges that the position of CCSBT members is currently to use national allocations as a commercial limit as New Zealand has done in the past but considers that this is more by omission than design. MFish notes that the Convention itself is unclear on this point, referring generally to “fishing”, making no distinction between commercial and “other” fishing. MFish holds the view that it is inconsistent with the Convention for the Conservation of Southern Bluefin Tuna (and the principles of good fisheries management reflected in the 1996 Act) not to count all fishing and fishing related mortality within national allocations. These are unresolved issues in the fishery at an international level particularly in relation to recreational and fishing related mortality allowances.
- 28 New Zealand proposes to formally raise these issues at CCSBT. MFish notes the Solander submission that strategically other issues of interest to New Zealand will be on the agenda of the CCSBT meeting in October 2004. It may not be possible for the CCSBT to agree on all issues at that meeting. In the event that a formal position is established by CCSBT, this can be implemented during the course of the fishing year.
- 29 If the outcome of CCSBT deliberations is that additional catch should be made available for allowances or that allowances are outside of national allocations changes can be made to increase the TAC for southern bluefin tuna during the course of the 2004–05 fishing year.
- 30 MFish confirms its view that in the interim the TAC for southern bluefin tuna should be set at the level of the national allocation, that is 420 tonnes.

Proposed allowances and TACC

Customary Maori and Recreational allowances

Submissions

- 31 **SeaFIC** submit that if there is no known customary catch then MFish policy suggests that no allowance should be made for customary Maori fishing. SeaFIC say that there is no criterion in the customary catch that would result in the nominal allowance proposed by MFish.

- 32 The **Tuna Management Association of New Zealand (Inc)** support the SeaFIC submission in regard to the introduction of the tuna species into the QMS.
- 33 **Te Runanga o Otakou (Inc)** submit that pursuant to the Settlement Act the Minister of Fisheries is required to develop policies to help recognise the use and management practises of takatā whenua in the exercise of customary non-commercial fishing rights. Te Runanga o Otakou (Inc) propose that a minimum non-commercial allowance of 25% of the TAC is set for all species proposed for introduction into the QMS of which 80% should be made available for customary Maori fishing. Te Runanga o Otakou (Inc) submit that a customary allocation does not require a harvest to be deemed to be utilised traditionally.

MFish response

- 34 MFish proposed a nominal allowance of 4 tonnes for recreational fishing and 1 tonne for customary Maori fishing.
- 35 SeaFIC is correct that MFish policy guidelines suggest that if there is no known customary catch then no allowance for customary Maori fishing should be made. MFish notes that these guidelines are not prescriptive and are not intended to fetter decisions in relation to individual fish stocks. Guidelines need to be considered in relation to the circumstances at hand rather than being applied in rote fashion.
- 36 There are no estimates of customary Maori catch however MFish considered that it would be presumptuous to conclude that no customary Maori catch occurred, particularly at the nominal level proposed. MFish has received no other submissions to suggest that there should be no allowance for customary Maori fishing. MFish notes the views of Te Runanga o Otakou (Inc) but concludes equally that a standard approach to setting allowances in the manner suggested is not appropriate. Rather a case-by-case consideration is indicated.
- 37 In relation to southern bluefin tuna there are no estimates of recreational catch but it is known that this species is targeted in some areas and catches to an unknown level have been achieved in the past. A nominal allowance for recreational fishing has been proposed.
- 38 MFish confirms its view that there should be an allowance set for customary Maori fishing of 1 tonne and an allowance set for recreational fishing of 4 tonnes.

Allowances for other sources of mortality

Submissions

- 39 **Sanford Limited** strongly opposes the application of any mortality allowance from the existing 420 national allocation. Sanford Limited assert that because discarding of quota species is against the law no southern bluefin tuna will be discarded and therefore no mortality allowance is required.
- 40 **SeaFIC** has difficulty in comprehending the inclusion of other sources of mortality category given that the QMS imposes an obligation to land all caught fish (except those released pursuant to Sixth Schedule).
- 41 SeaFIC submits that if MFish insist that there should be other (even illogical) allowances they should be over and above a TACC of 420 tonnes.

- 42 The **Tuna Management Association of New Zealand (Inc)** support the SeaFIC submission in regard to the introduction of the tuna species into the QMS.

MFish response

- 43 MFish proposed an allowance of 2 tonnes for other sources of fishing related mortality.
- 44 As the submission by Sanford Limited notes, once a species enters the QMS it becomes unlawful for catch to be discarded unless specified circumstances apply. However, the proposal to allow for other sources of fishing related mortality is based on observed estimates of southern bluefin tuna (0.54% of catch) that are lost at the boat or discarded and assumes that there will be a level of mortality associated with such losses. MFish considers that it is reasonable to assume that some loss of fish beyond a fisher's control (and the associated fishing mortality) will continue when southern bluefin tuna is within the QMS. This should be allowed for.
- 45 The assessment of other sources of fishing related mortality was based on observed catches in the southern bluefin tuna fishery. Should future observer coverage indicate that an alternative allowance is appropriate then adjustment can be made at that time. MFish confirms its view that an initial allowance should be set for other sources of fishing related mortality of 2 tonnes.

TACC

Submissions

- 46 Industry submissions on the TACC have been addressed in the TAC section above.

MFish response

- 47 Having allowed 5 tonnes for non-commercial use and 2 tonnes for other sources of fishing-related mortality, a TACC of 413 tonnes was proposed.
- 48 A TACC at this level is based on the premise that there is no over catch of the southern bluefin tuna catch limit in the current fishing year. While MFish monitoring is intended to prevent over catch, managing against a competitive catch limit is inexact. Given the timing of decisions for the TAC, allowances and TACC for species to be introduced into the QMS on 1 October 2004 it will not be possible to make an adjustment for over catch in the 2003–04 fishing year for the 2004–05 fishing year.
- 49 Past practise has been to reduce the catch limit for the following fishing year in the event that a catch limit is exceeded in any one fishing year. MFish will need to advise CCSBT that alternative arrangements will apply once southern bluefin tuna is in the QMS. It will not be possible to determine the annual catch of southern bluefin tuna against the TACC until after the completion of a fishing year. This will be too late to reduce the catch limit for the following year (only increases in a TAC can be made once a fishing year has commenced) and the reduced catch limit will need to apply for the following fishing year.
- 50 A range of mechanisms are considered in this advice to assist in ensuring that annual catch of southern bluefin tuna remains within the national allocation. If these are unsuccessful then an alternative arrangement is the setting of a low TAC and annually increasing the TAC pursuant to s 14(6) based on the catch in the previous fishing year (if appropriate).

MFish proposes that this alternative is considered only if continual over catch in the fishery occurs.

- 51 A further alternative would be the agreement of CCSBT to an under and over fishing regime to provide more flexible fishing arrangements to the southern bluefin tuna fishing fleet. This issue is addressed in more detail in the section relating to Schedule 5A of the 1996 Act below.

Deemed value and overfishing thresholds

Submissions

- 52 **SeaFIC** agrees in principle that strong financial disincentives are needed to discourage targeting of southern bluefin tuna without ACE. SeaFIC submits that there are inconsistencies in the application of MFish deemed value policies and suggests that if MFish were consistent southern bluefin tuna would best fit the “all other stocks category”. Having noted the inconsistency SeaFIC submits that southern bluefin tuna best fits the high value single species category for deemed value purposes.
- 53 SeaFIC submit that deemed values paid on southern bluefin tuna should be returned directly to quota holders in proportion to their quota holding since their quotas the following year will be directly affected.
- 54 The **Tuna Management Association of New Zealand (Inc)** support the SeaFIC submission in regard to the introduction of the tuna species into the QMS.
- 55 **TOKM** submit that after QMS entry southern bluefin tuna will be no different from any other species fished by methods taking multiple species. As such TOKM submit that there can be no justification for classifying southern bluefin tuna as other than *All Other Fishstocks* category as is proposed for bigeye tuna. Accordingly TOKM recommends the following deemed value regime:
- a) Classification – all other fish stocks;
 - b) Deemed value rate – 75% of port price;
 - c) Annual deemed value rate - \$16.43 per kg;
 - d) Apply differential deemed value rates; and
 - e) Do not apply overfishing thresholds
- 56 **Sanford Limited** submit that high deemed values in combination with southern bluefin tuna not being included on the Sixth Schedule are positive management methods under the QMS to ensure catches stay within the national allocation (TACC) and to protect property rights. Sanford Limited support the deemed value being set at \$43.82, which is twice the current port price.
- 57 Sanford Limited also submit that any deemed value paid on southern bluefin tuna should be returned directly to quota owners in proportion to their quota holdings as the quota held will be directly reduced in proportion to overcatch.

MFish response

- 58 MFish proposed that southern bluefin tuna best fits in the high value single species category for which the annual deemed value should be set at twice the port price (\$21.91). A deemed value for southern bluefin tuna of \$43.82 per kg and the application of differential deemed values was proposed.
- 59 With the exception of TOKM submissions support the deemed value of \$43.62 proposed. TOKM and others suggest however that it is inconsistent with MFish policy guidelines. SeaFIC in particular submit on the need for a review of policy guidelines. This aspect of the SeaFIC submission is addressed in the generic section of this advice.
- 60 The policy guidelines describe three categories, which in essence determine the deemed value rate. High value single species fisheries fishstocks are those that have high port prices and ACE values and are taken with little if any bycatch. The deemed value rate for this category is 200% of port price. There is no doubt that southern bluefin tuna has a high value. A policy principle behind this category is that the high value of the stock means that there is potential for large profits to be made from taking catch in excess of ACE. Value is therefore a significant determinant when choosing a category for deemed value setting.
- 61 All species currently in this category with the exception of paua have a level of bycatch. Some have a significant level in relation to the power of the fishing method employed (for example rock lobster pots).
- 62 The fishery for southern bluefin tuna is highly seasonal and is aggregated in space. There is a known season and there are known fishing grounds. Fishers that wish to catch southern bluefin tuna go to these fishing grounds in the season and fishers that do not wish to catch southern bluefin tuna avoid them at that time. This is further emphasised by the fact that, under current competitive fishing arrangements, when the catch limit is reached and the fishery is closed fishers move to new locations to avoid catching southern bluefin tuna. The fishery has characteristics of a single species fishery despite the bycatch of the fishing method employed.
- 63 The description of the alternative category suggested by TOKM *All Other Fishstocks* makes no reference to bycatch levels. The policy description is simply 'fish stocks that do not necessarily have a high unit value and for which there is adequate information for MFish to have confidence in the TACC'. MFish does not consider that this is an appropriate category for southern bluefin tuna.
- 64 MFish confirms its view that the best fit for southern bluefin tuna is the "high value single species fisheries fishstocks" category for which deemed values are set at 200% of port price. A new port price of \$23.46 per kg has been assessed for the 2003 year. This is increased from the value used for initial proposals. MFish recommends that a deemed value of \$46.92 is set based on new port price information and confirms its view that differential deemed values should apply.
- 65 A further issue raised in submission is that deemed values should be returned to quota holders in proportion to their holdings to compensate them for any reduction in TACC that results from fishing outside of the authority of annual catch entitlements. Legislation does not currently provide for this to occur. Further the strategy proposed by MFish is to minimise the potential for catch over and above annual catch entitlement by setting high deemed values, providing for the release of southern bluefin tuna if it is alive and likely to

survive and providing for differential deemed values. A further mechanism, not proposed at this stage is the imposition of an over fishing threshold which can be applied if over fishing still occurs.

- 66 SeaFIC raise an interesting issue with regard to differential deemed values. They submit that these unfairly differentiate between large and small quota holders. While it is an extreme example, a fisher who holds no annual catch entitlement for southern bluefin tuna is deemed to hold one kilogram. The capture of a single southern bluefin tuna (they range in size from 30 to 150 kilograms) will mean that the fisher has exceeded his annual catch entitlement by 200% and is therefore liable for a payment 200% of the annual deemed value for that excess if they are unable to acquire annual catch entitlement during the course of the fishing year. The potential predicament of smaller quota holders in this circumstance provides support for the use of the provisions of the Sixth Schedule (the release of live southern bluefin tuna) discussed below.

Other management measures

Schedule 5A: under-fishing provisions

Submissions

- 67 **SeaFIC** notes that a double jeopardy is proposed to curtail over catch (a high deemed value and a subsequent reduction in TACC) and submits that the obverse should also apply. If a highly migratory species stock has been under fished then ACE should be carried forward to the following year.
- 68 The **Tuna Management Association of New Zealand (Inc)** support the SeaFIC submission in regard to the introduction of the tuna species into the QMS.
- 69 **Solander** submit that southern bluefin tuna should not be listed on Schedule 5A of the 1996 Act and that no highly migratory species should be so listed. Solander submit that, given the hefty deemed value penalties and reduction of TACC in the event of overfishing, there must be compensation in an under fishing situation. Solander submits that underfishing provisions under CCSBT are required. Solander submit that the failure to implement underfishing provisions has imposed a significant cost on New Zealand with a substantial underfishing of the national allocation (1 097 tonnes) over 13 years.
- 70 **Sanford Limited** oppose the proposal to list southern bluefin tuna on Schedule 5A and consider that the ability to carry forward 10% of ACE should be preserved for southern bluefin tuna. This is considered essential to ensure that the resource is utilised.
- 71 **TOKM** sees no reason to treat southern bluefin tuna differently from other highly migratory species and submit that the proposal to list southern bluefin tuna on Schedule 5A should be withdrawn.

MFish response

- 72 MFish proposed to list southern bluefin tuna on Schedule 5A of the 1996 Act which would prohibit the carry forward of under-fishing rights up to 10% of ACE. The carry forward of under fishing rights as provided for in section 67A of the 1996 Act was not considered to be

a viable option for southern bluefin tuna because of the obligation to maintain the integrity of the catch limit annually.

- 73 As the Solander submission notes there is no agreed position on under fishing at CCSBT. The New Zealand interpretation of current obligations is however to account for annual over catch by reducing the following years commercial catch limit.
- 74 MFish acknowledges that this does impose a cost because, as noted in submission, past under catch has been foregone. In a QMS environment fishers will be unwilling not to catch their full entitlement of ACE in a given year because of its high value. This will create strong incentives for individual fishers to fish to their individual limits with an associate risk that they exceed their annual catch entitlement. Allowing for the carry forward of under fishing will remove that incentive but will make the annual balancing of catch to national allocations that much more difficult.
- 75 Having considered submissions MFish is of the view that allowing the carry forward of under-fishing rights is the preferred option in the short term. MFish proposes to defer a decision on listing southern bluefin tuna on Schedule 5A until the outcome of CCSBT decisions on under and overfishing is known.

Sixth Schedule

Submissions

- 76 **Solander** consider the risk of abuse is too high and do not support the proposal.
- 77 **Sanford Limited** opposes the proposed inclusion of southern bluefin tuna on the Sixth Schedule. Sanford Limited is concerned that this would allow fishers without ACE to continue to target other fish in the fishery while possibly discarding southern bluefin tuna that is caught as “bycatch”. Sanford Limited is concerned that this undermines the value of those with southern bluefin tuna property rights by not sending a strong message to those without property rights in the fishery to either leave or modify their practises.
- 78 **TOKM** supports the proposal to list southern bluefin tuna on the Sixth Schedule.
- 79 **SeaFIC** questions why the provisions of the Sixth Schedule do not apply to all highly migratory species. By implication SeaFIC support the listing of southern bluefin tuna on the Sixth Schedule.
- 80 The **Tuna Management Association of New Zealand (Inc)** support the SeaFIC submission in regard to the introduction of the tuna species into the QMS.

MFish response

- 81 MFish accepts the submissions of Solander and Sanford Limited that listing of southern bluefin tuna on the Sixth Schedule poses a risk that fishers will continue to fish in areas with a catch of southern bluefin tuna which could be discarded and the catch of other species retained.
- 82 This situation is encountered annually under the current competitive fishing arrangements. When the annual competitive catch limit is reached, and the fishery is closed, it becomes an offence to take southern bluefin tuna. The longline fleet typically responds by moving

from the known southern bluefin tuna fishing grounds. If the Sixth Schedule applied then there would be no offence if fishers fished without annual catch entitlement on known southern bluefin tuna fishing grounds in order to retain the catch of other species as long as they only released southern bluefin tuna under terms prescribed in the Schedule. Solander and Sanford Limited see the potential for this to happen.

- 83 The proposal to list southern bluefin tuna on the Sixth Schedule was intended to assist the industry by providing some flexibility to fishers who may occasionally catch southern bluefin tuna and have no or insufficient ACE. The proposal also had benefits as a tool to constrain annual catch within the national allocation and avoid the need for annual adjustments in TACC. MFish still sees benefit in this proposal despite the risks identified in submission. This mechanism is particularly relevant to smaller quota holders who may be unreasonably penalised by even small catches of southern bluefin tuna over and above their annual catch entitlement because of the high deemed values and the differential deemed value provisions proposed.
- 84 There is a minimal risk to the sustainability of southern bluefin tuna as long as the provisions proposed for release (fish must be alive, likely to survive and be released immediately) are adhered to. A greater risk is indiscriminate dumping to avoid deemed value provisions. MFish confirms its view that the provisions of the Sixth Schedule should apply subject to conditions.

Consequential amendments to regulation

Submissions

- 85 TOKM in submission agrees that the Fisheries (Southern Bluefin Tuna Quota) Regulations 2000 should be revoked at the time the species enters the QMS and agrees that Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001 will then no longer be required.

MFish response

- 86 As a consequence of the introduction of southern bluefin tuna into the QMS, MFish proposed revoking the Fisheries (Southern Bluefin Tuna Quota) Regulations 2000 and Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001. A further proposal was to amend the Fisheries (Reporting) Regulations 2001 and the Fisheries (Recordkeeping) Regulations 1990.
- 87 MFish confirms its view that the Fisheries (Southern Bluefin Tuna Quota) Regulations 2000 and Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001 should be revoked once southern bluefin tuna are introduced into the QMS on 1 October 2004 and that there should be consequential amendment to the Fisheries (Reporting) Regulations 2001 and the Fisheries (Recordkeeping) Regulations 1990.

Legal Obligations

- 88 The statutory considerations that must be taken into account when setting a TAC and allowances for southern bluefin tuna were identified in the IPP (refer to IPP para 38-48). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Recommendations

89 MFish recommends that you:

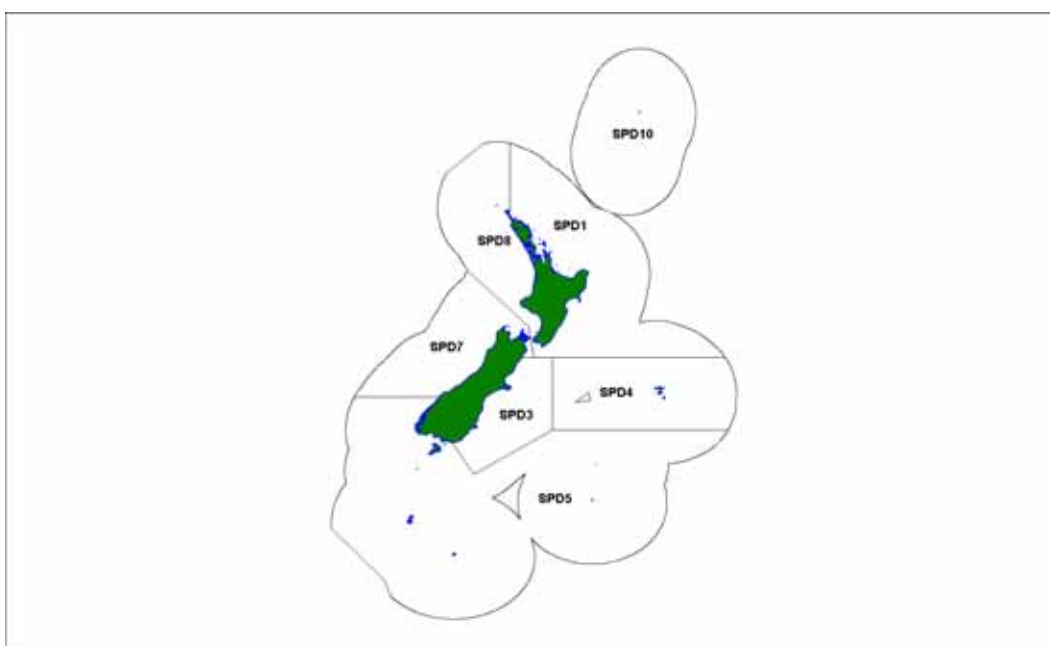
- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for southern bluefin tuna otherwise than in accordance with s13(2) of the 1996 Act.
- b) **Agree** to set a TAC for southern bluefin tuna pursuant to s 14 of the 1996 Act.
- c) **Agree** to set a TAC for southern bluefin tuna of 420 tonnes and within this set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 4 tonne;
 - iii) An allowance of 2 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 413 tonnes.
- d) **Agree** to set a deemed value for southern bluefin tuna of \$46.92 per kg.
- e) **Agree** that differential deemed values apply.
- f) **Agree** to list southern bluefin tuna on the Sixth Schedule of the 1996 Act.
- g) **Agree** not to list southern bluefin tuna on Schedule 5A of the 1996 Act until the outcome of CCSBT consideration of an under and over fishing arrangement is known.
- h) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001 and the Fisheries (Recordkeeping) Regulations 1990.
- i) **Agree** to revoke the Fisheries (Southern Bluefin Tuna Quota) Regulations 2000.
- j) **Agree** to revoke Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001.

SPINY DOGFISH (SPD) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 **Spiny dogfish** (*Squalis acanthias*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Areas (QMAs) for spiny dogfish are outlined in Figure 1. The fishing year for spiny dogfish will be from 1 October through to 30 September in the following year and Total Allowable Commercial Catch (TACC) and Annual Catch Entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: Quota Management Areas for spiny dogfish (SPD).



Key Issues to be Considered

- 2 There is a potential sustainability risk for spiny dogfish due to the biological characteristics of spiny dogfish (low fecundity, late maturity and low natural mortality), the large volume of spiny dogfish taken as a bycatch, and the species' potential as a target fishery. Catches of spiny dogfish have increased in recent years partly as a result of higher market demand following the collapse of overseas spiny dogfish fisheries. While there are no apparent trends in catches or information from trawl surveys to indicate a current sustainability concern, this information is unreliable and may not accurately reflect actual abundance. For these reasons, it was decided last year that spiny dogfish should be managed within the QMS.
- 3 Management within the QMS may, however, result in an economic cost to some fishers, in particular, fishers may face additional costs if all spiny dogfish is required to be landed (as is normally the case for QMS stocks). This is because spiny dogfish is caught in high volumes but is often of low value. The tough skin and spines of spiny dogfish make processing into fishmeal difficult. Some fishers have expressed concern that catches of spiny dogfish will either take up valuable freezer space at sea,

only to be dumped in landfills once vessels return to port, or will be illegally dumped at sea and not reported.

- 4 Other fishers consider spiny dogfish is currently under-utilised and under-valued and that there is an opportunity to extract further economic value from spiny dogfish catches now the fishery is to be managed within the QMS. They note that costs in terms of unwanted bycatch of spiny dogfish will depend largely on the management settings for spiny dogfish within the QMS.
- 5 In considering these divergent views, the previous Minister of Fisheries stated, when he decided to introduce spiny dogfish into the QMS, that he favoured the development of management measures within the QMS that provided the best reporting outcomes and avoided or reduced the costs associated with landing unwanted spiny dogfish.

List of Management Options

- 6 MFish proposes a management approach within the QMS that prevents catches of spiny dogfish exceeding recent catch levels, pending further stock assessment information. In absence of information on B_{MSY} and the relationship between current biomass and B_{MSY} , MFish proposes the TAC for spiny dogfish be based on commercial catch during recent fishing years, known or estimated levels of recreational and Māori customary catch, and an estimate of all other sources of fishing-related mortality (refer Table 1). MFish proposes two options be considered for SPD5; a TAC based on commercial catch during the last three fishing years (option 1) or a TAC based on catch during the 2001–02 fishing year (the highest recorded catch for this QMA, option 2).

Table 1: Proposed TAC, TACC, and allowances for spiny dogfish (in tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
SPD1	413	39	39	4	331
SPD3	5 075	115	115	51	4 794
SPD4	1 356	10	10	14	1 322
SPD5 option 1	3 076	8	8	31	3 029
SPD5 option 2	4 423	8	8	44	4 363
SPD7	1 645	31	31	16	1 567
SPD8	338	41	41	3	253
SPD10	2	1	1	0	0

- 7 As noted, the previous Minister and MFish also favour an approach that provides the best possible reporting outcomes and avoids or reduces the costs associated with landing unwanted spiny dogfish. MFish considers this can be achieved by allowing operators to choose whether to land spiny dogfish or whether to return them to the sea, and by ensuring settings within the QMS do not create an incentive to dump and not report spiny dogfish catch. MFish preference is to allow spiny dogfish to be returned to the sea (alive or dead) provided all discarded catch is counted against ACE.

- 8 MFish also proposes to:
- a) Amend the reporting regulations to ensure that the appropriate fishstock codes for spiny dogfish are used under the QMS; and
 - b) Set deemed values for spiny dogfish.

TACs

TAC management strategy

- 9 MFish proposes that the default management option for TAC setting under s 13 of the Act apply to spiny dogfish stocks. MFish considers that the purpose of the Act would not be better achieved through use of an 'alternative TAC' under s 14. The biological characteristics of the species do not render the estimation of MSY impossible, nor are the catch limits for any of the stocks part of an international agreement¹. The fishery is not managed on a rotational or enhanced basis.
- 10 Section 14B of the Act provides a further alternative management strategy. This provision enables a TAC to be set that maintains a stock at a level that ensures its long-term viability, while other inter-related stocks can be taken at TAC and TACC levels set for those stocks based on B_{MSY} . Spiny dogfish is a species of commercial value. Managing this species at a level other than that permitted under s 13 of the Act (i.e. B_{MSY}) may have a detrimental effect on commercial fishing interests.

Rationale for proposed TACs

- 11 MFish considers there is a potential sustainability risk for spiny dogfish due to the biological characteristics of spiny dogfish (low fecundity, late maturity and low natural mortality), the large volume of spiny dogfish taken as a bycatch, and the species' potential as a target fishery. The poor record of overseas spiny dogfish fisheries confirms that spiny dogfish are susceptible to overfishing. However, there are no apparent trends in catches or information from trawl surveys to indicate a current sustainability concern for New Zealand spiny dogfish. While this information is unreliable and may, or may not, accurately reflect changes in abundance of spiny dogfish, the plenary has concluded that recent catch levels of spiny dogfish are probably sustainable and will probably allow the stocks to move towards a size that will support MSY.
- 12 Therefore, as noted, MFish favours a management approach within the QMS that constrains catches at recent catch levels, pending further stock assessment information. A TAC based on these catch levels should maintain spiny dogfish stocks at or above levels that can produce MSY. MFish proposes the TACs be based on recent levels of commercial catch together with known or estimated levels of recreational and Māori customary catch, and other sources of fishing-related mortality.
- 13 MFish proposes to base TACs for most QMAs on an average of the last three years commercial catch. This is consistent with policy guidelines for establishing TACs (refer generic section of this document) as reported catches have increased in this

¹ MFish notes spiny dogfish in the Northern Hemisphere has been proposed as a potential candidate for Appendix II CITES listing.

period. Reporting is also likely to have improved recently and it is believed that TACs based on more recent fishing years are likely to better represent actual historical catch. Bycatch rates for spiny dogfish on vessels with Scientific Observer Programme observers for the hoki fishery and for major fisheries on the Chatham Rise^{2 3} indicate spiny dogfish typically comprises less than 1% of total observed catch and suggest that recent reporting of spiny dogfish is broadly consistent with observed catch rates from these fisheries.

- 14 However, for SPD7 and SPD8, MFish proposes to use the average of the last ten years commercial catch as a basis for setting TACs. This is because catch in these QMAs is stable or has shown no particular trend over this period. The policy guidelines for establishing TACs (refer generic section of this document) recommend using the average ten-year catch under such circumstances and this is likely to be a better indicator of a catch level that will keep the stock at or above a level that can produce MSY.
- 15 In addition, MFish has included an option using the 2001–02 fishing year catch as the basis for setting a TAC for SPD5. MFish notes that catch in this QMA has fluctuated even over the past three years (1 601 tonnes in 2000–01 to 4 363 tonnes in 2001–02⁴). This may be due to changes in the target fisheries that take spiny dogfish as a bycatch in this QMA or annual variation in abundance of spiny dogfish. MFish notes that the relative biomass of spiny dogfish in this QMA appears to have increased during the 1990s (refer Annex 3, Table 3). A TAC based on catches over the past three and ten years may be unrepresentative of likely future catches, whereas a TAC based on the 2001–02 year, which is the highest catch recorded for this QMA, would accommodate future catches at the 2001–02 level and take into account possible increased biomass in this QMA. On these grounds, a TAC based on the 2001–02 fishing year may be a better indicator of a catch level that will keep the SPD5 stock at or above a level that can produce MSY.
- 16 MFish notes that catches during 2002–03 declined for some QMAs, possibly as a result of market competition from Mexican-sourced spiny dogfish. An alternative option for all QMAs is to base TACs on the 2001–02 fishing year, which had the highest reported catch of spiny dogfish. Given there is no information to indicate a current sustainability concern for spiny dogfish, MFish considers any of these options would prevent catches exceeding recent catch levels without significantly impacting on the economic viability of the spiny dogfish fishery and the other fisheries of which it is a bycatch. However, MFish favours using the average of the last three years (or ten years in the case of SPD7 and 8), as this is consistent with catch-setting criteria, smoothes any unusual catches for each QMA and represents a more cautious approach given the potential susceptibility of spiny dogfish to over-fishing. MFish has used this as the basis for the following proposed TACs.

² Trends in incidental catch of major fisheries on the Chatham Rise for the fishing years 1989–90 to 1998–99. Ministry of Fisheries FAR 2003/52.

³ Catches, size and age structure of the 2001–02 hoki fishery, and a summary of input data for the 2003 stock assessment. Ministry of Fisheries FAR 2003/42.

⁴ The FMA5 fishery was closed for the last month of the 2001–02 fishing year when a regulatory competitive catch limit for that area was breached. Catches were unlikely to be significantly reduced by this closure, however, as it occurred late in the fishing year and outside the main fishing period for spiny dogfish in FMA5.

SPD1

- 17 Reported commercial catch of spiny dogfish in SPD1 (which comprises FMAs 1 and 2) increased in the late 1990s but has been relatively stable over the past three years (Annex 3). Recreational surveys indicate non-commercial fishers take a moderate amount of spiny dogfish in this area. MFish proposes a TAC of 413 tonnes for SPD1.

SPD3

- 18 SPD3 has the highest reported catches of spiny dogfish of any QMA. Reported catch in this QMA generally increased during the late 1990s (Annex 3) but has stabilised since. Recreational catch of spiny dogfish is also highest in this QMA. MFish proposes a TAC of 5 075 tonnes for SPD3.

SPD4

- 19 Reported catch in SPD4 has followed a similar pattern to SPD1 and SPD3. MFish proposes a TAC of 1 356 for SPD4.

SPD5

- 20 Catches in SPD5 (FMAs 5 and 6) have fluctuated greatly even during the past three years (Annex 3). MFish proposes two TAC options for SPD5: a TAC of 3 076 based on the average of the last three years or a TAC of 4 423 based on the 2001–02 fishing year, which is the highest catch recorded for this QMA. The latter option would accommodate future catches at the 2001–02 level and take into account that spiny dogfish biomass may have increased recently in this QMA (Annex 3, Table 3).

SPD7

- 21 Reported catch in SPD7 increased during the early 1990s, but has remained relatively stable since then. Non-commercial catches in this QMA are moderate (Annex 3). MFish proposes a TAC of 1 645 tonnes, which is based on an average of the last ten fishing years.

SPD8

- 22 There has been limited reported catch in SPD8 (FMAs 8 and 9) in recent years. MFish notes that reported catch may not necessarily reflect actual abundance of spiny dogfish in this area, but could result from fewer target fisheries taking spiny dogfish as a bycatch in this area. MFish proposes to set a TAC of 338 tonnes, which is based on an average of the last ten fishing years.

SPD10

- 23 There is likely to be no significant catch of spiny dogfish in SPD10. MFish proposes a TAC of 2 tonnes.

Allocation of TAC

Recreational Allowance

- 24 Overall, recreational landings probably comprise only a small proportion (<10%) of the total spiny dogfish catch (refer Annex 3). MFish considers that the best available estimate of the recreational catch for spiny dogfish is derived from the most recent recreational fishing survey estimates in 2000. Proposed allowances are set out in Table 1.
- 25 No survey estimates are available for SPD4 or SPD10. Allowances in these QMAs are nominal based on assumed abundance of spiny dogfish.
- 26 Recreational survey data may under-estimate the catch as most recreational fishers discard spiny dogfish and not all diarists will have accurately recorded their catch. An allowance for mortality due to discarding of unwanted spiny dogfish by recreational fishers is included in other sources of fishing-related mortality.
- 27 When considering the allowance for recreational interests for spiny dogfish, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made under s 311 of the 1996 Act. No such regulations have been made and, accordingly, no adjustment to the proposed allowance needs to be considered on this basis.

Customary Māori Allowance

- 28 Quantitative information on the current level of customary Māori catch is not available. Māori fishers have traditionally caught large numbers of “dogfish” (including rig, school shark and spiny dogfish), therefore MFish considers spiny dogfish are of importance to customary Māori. Consistent with MFish policy under such circumstances (refer generic section of this document) MFish proposes to set the allowance at the same level as that for recreational catch. Proposed allowances are set out in Table 1.
- 29 In considering the allowance for Māori customary non-commercial interests, the Minister is required to take into account any mātaihai reserve or s 186A closure. MFish does not consider that the allowances proposed will detract from the intent of any mātaihai reserve or s 186A closure presently in place, nor will the allowance be likely to be insufficient in terms of customary use of spiny dogfish in these areas.

Allowance for other sources of mortality

- 30 The level of illegal take of spiny dogfish is likely to be low as, compared to other species, it is often of low value.
- 31 As set out later in this paper, MFish proposes management settings for spiny dogfish within the QMS that encourage accurate reporting of spiny dogfish catch. Given the TACCs, deemed values and return-to-sea recommendations of this paper, MFish does not expect substantial illegal non-reporting of spiny dogfish within the QMS and does not propose to make an allowance for this at this time. MFish will monitor the spiny dogfish fishery to confirm that this is the case.

- 32 A small allowance of 1% of the TAC is proposed to account for mortality due to discarding of unwanted spiny dogfish by recreational and customary fishers. Proposed allowances are set out in Table 1.

TACC

- 33 MFish proposes to base TACCs on an average of the last three years commercial catch for all QMAs except SPD7 and SPD8 where MFish proposes to use the average of the last ten years commercial catch as a basis for setting TACCs. This is consistent with policy guidelines for establishing TACCs and TACs (refer generic section of this document). Reporting is also likely to have improved recently, and it is believed that TACCs based on the more recent fishing years are likely to better represent actual historical catch. Proposed TACCs are set out in Table 1.
- 34 MFish notes that catches during 2002–03 declined for most QMAs, possibly as a result of market competition from Mexican-sourced spiny dogfish. An alternative option is to base TACCs on the 2001–02 fishing year, which had the highest reported catch of spiny dogfish. Given there is no information to indicate a current sustainability concern for spiny dogfish, MFish considers either option would prevent catches exceeding recent catch levels without significantly impacting on the economic viability of the spiny dogfish fishery and the other fisheries of which it is a bycatch. However, apart from SPD5, MFish favours using three and ten year averages as the basis for TACCs as this is consistent with catch-setting criteria, smoothes any unusual catches for each QMA and represents a slightly more cautious approach given the potential susceptibility of spiny dogfish to over-fishing. For SPD5, MFish has included the option of a TACC based on the 2001–02 fishing year to take into account fluctuations in recent catch levels in this QMA.

Other Management Measures

- 35 Specific measures are proposed in respect of:
- Providing for spiny dogfish to be returned to sea;
 - Making consequential amendment to the fisheries reporting regulations; and
 - Setting a deemed value for spiny dogfish.

Providing for spiny dogfish to be returned to sea

- 36 MFish proposes an exemption be provided under the Sixth Schedule allowing spiny dogfish to be returned to sea, despite this being generally prohibited for QMS species. This would allow operators to choose whether to land spiny dogfish or whether to return them to the sea and, thereby, avoid costs associated with landing spiny dogfish in circumstances where the spiny dogfish is of low value and likely to be dumped on land. Such an approach should result in better reporting of spiny dogfish catches by reducing the incentive to illegally dump and not report. The proposal is outlined in full in Annex 1.
- 37 MFish proposes to allow dead (as well as alive) spiny dogfish to be returned to sea, but with all discards to be counted against ACE. MFish proposes to implement this option by adding spiny dogfish to the Sixth Schedule and amending the reporting

regulations (see below). However, the way in which this option is implemented may change depending on the outcome of MFish's review of integration between these regulations and the Sixth Schedule⁵.

Consequential amendment to regulations

- 38 As a consequence of the introduction of spiny dogfish into the QMS, and the proposal to add spiny dogfish to the Sixth Schedule MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are attached as Annex 2 to this section.

Deemed values and overfishing thresholds

- 39 A separate section in this document sets out generic information on the setting of interim and annual deemed values and overfishing thresholds.
- 40 Given that the issues in terms of sustainability for spiny dogfish relate to potential vulnerability rather than immediate sustainability concerns, MFish considers that spiny dogfish fits the category of low knowledge fishstocks. MFish proposes to set the initial deemed value for spiny dogfish by using a factor of 60 % of the port price.
- 41 A port price of \$0.50 per kg has been determined for spiny dogfish⁶ and, therefore, an annual deemed value of \$0.30 per kg is proposed. However, port price is likely to be influenced by the quantity landed. For example, the current port price for spiny dogfish is based on the non-QMS regime where return to sea of unwanted spiny dogfish is allowed⁷. Were all spiny dogfish required to be landed within the QMS, the port price is likely to drop. Therefore, if spiny dogfish enters the QMS without a provision allowing return to sea of unwanted spiny dogfish, port price may need to be adjusted accordingly. MFish invites submissions from fishers on the appropriate port price for spiny dogfish for setting interim and annual deemed values.
- 42 Consistent with the policy framework for low knowledge fishstocks, MFish does not propose to set differential deemed values for spiny dogfish. Nor does MFish propose to set overfishing thresholds for spiny dogfish, unless monitoring of catch against TACCs suggests that this is required in the future.
- 43 MFish proposes that a carry forward of 10 % of ACE be allowed for spiny dogfish on the basis that this will not unreasonably increase the sustainability risk to the stocks, and will allow more flexibility for fishers in managing their fishing operations.

⁵ There is current uncertainty in terms of how the wording of the Fisheries (Reporting) Regulations 2001 integrates with the Sixth Schedule. MFish will be making a determination on this issue prior to October 2004, following discussions with industry. Until then, fishers have been advised to continue with established practice.

⁶ MFish Port Price by Fishery Survey, December 2003.

⁷ For the 2002-03 fishing year, around one-third (3 579 t) of all spiny dogfish caught (10 675 t) was landed to a licensed fish receiver.

Statutory Considerations

44 In forming the management options the following statutory considerations have been taken into account.

- a) Spiny dogfish is primarily a bycatch fishery, therefore, the environmental impacts of fishing are most appropriately considered under the management provisions of the target species.
- b) The management options seek to ensure sustainability of the stock as required by s 8 by setting a TAC and other appropriate measures. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers.

While spiny dogfish is an inevitable bycatch of other fisheries and, therefore, setting a TACC for spiny dogfish could possibly act to constrain the target fisheries, MFish considers that this prospect is mitigated by the TACCs and other proposed management measures.

- c) With a TACC based on recent catch levels, MFish considers that there will not be a significant impact on social, economic and cultural factors.
- d) There are no relevant fisheries plans approved that would have a bearing on the management measures proposed for spiny dogfish. Relevant conservation services or fisheries services are generally covered by the target fisheries. Cost recovery levies are already charged for spiny dogfish.
- e) Setting the TACs for spiny dogfish at recent catch levels that appear to be sustainable provides for the current level of utilisation and is consistent with the general obligations. It is likely to maintain the stocks at or above the level that can produce the maximum sustainable yield having regard to the interdependence of stocks. Further, setting the TACs at recent catch levels is unlikely to impact on customary and recreational sectors and, therefore, will not affect utilisation by these sectors.
- f) Spiny dogfish is primarily taken as a bycatch of other target fisheries, however, there is no evidence that interactions within these fisheries are of significant magnitude to impact on associated and dependent species, or on biological diversity.
- g) As primarily a bycatch species, the current level of environmental impact occurs irrespective of how SPD is managed. It is considered unlikely any potential impact to habitats of particular significance to fisheries management would be attributed to the bycatch of spiny dogfish. Any adverse impacts caused by increased catches or effort for spiny dogfish are likely to be correlated to the fishing methods for the target species and are best considered as part of the management of these fisheries. Impacts of set netting for spiny dogfish on Hector's dolphins and penguins (mainly blue and yellow-eyed) are unlikely as this fishery mainly occurs in winter and generally in deeper water outside the main areas these animals inhabit.
- h) There are no issues arising under s 5 of the 1996 Act (international obligations) and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 that affect consideration of the management options for spiny dogfish.

- i) There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options for spiny dogfish.
- j) There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for spiny dogfish. No decision has been made as to whether or not levies are required for conservation services for spiny dogfish.
- k) Similarly, before setting any sustainability measure relevant to the Hauraki Gulf, the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000. This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. MFish considers that setting of sustainability measures for spiny dogfish will better meet the purpose of the Act and ensure that the range of values associated with use of the spiny dogfish resource are enhanced for the people and communities in the area.
- l) The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaihai reserves exist within the QMAs for spiny dogfish, the values of mātaihai reserves will not be compromised as spiny dogfish are a widely dispersed stock. No area has been closed or fishing method restricted for customary fishing purposes that would affect the fishery. No restrictions have been placed on fishing within spiny dogfish QMAs for recreational interests.

Preliminary Recommendations

45 MFish recommends that the Minister:

- a) **Agrees** to set TACs for spiny dogfish pursuant to s 13 of the 1996 Act.
- b) **Agrees** to set a TAC of 413 tonnes for SPD1 and within that TAC set:
 - i) A customary allowance of 39 tonnes;
 - ii) A recreational allowance of 39 tonnes;
 - iii) An allowance for other fishing-related mortality of 4 tonnes; and
 - iv) A TACC of 331 tonnes.
- c) **Agrees** to set a TAC of 5 075 tonnes for SPD3 and within that TAC set:
 - i) A customary allowance of 115 tonnes;
 - ii) A recreational allowance of 115 tonnes;
 - iii) An allowance for other fishing-related mortality of 51 tonnes; and
 - iv) A TACC of 4 794 tonnes.
- d) **Agrees** to set a TAC of 1 356 tonnes for SPD4 and within that TAC set:

- i) A customary allowance of 10 tonnes;
- ii) A recreational allowance of 10 tonnes;
- iii) An allowance for other fishing-related mortality of 14 tonnes; and
- iv) A TACC of 1 322 tonnes.

EITHER

- e) **Agrees** either to set a TAC of 3 076 tonnes for SPD5 and within that TAC set:

- i) A customary allowance of 8 tonnes;
- ii) A recreational allowance of 8 tonnes;
- iii) An allowance for other fishing-related mortality of 31 tonnes; and
- iv) A TACC of 3 029 tonnes.

OR

- f) **Agrees** to set a TAC of 4 423 tonnes for SPD5 and within that TAC set:

- i) A customary allowance of 8 tonnes;
- ii) A recreational allowance of 8 tonnes;
- iii) An allowance for other fishing-related mortality of 44 tonnes; and
- iv) A TACC of 4 363 tonnes.

- g) **Agrees** to set a TAC of 1 645 tonnes for SPD7 and within that TAC set:

- i) A customary allowance of 31 tonnes;
- ii) A recreational allowance of 31 tonnes;
- iii) An allowance for other fishing-related mortality of 16 tonnes; and
- iv) A TACC of 1 567 tonnes.

- h) **Agrees** to set a TAC of 338 tonnes for SPD8 and within that TAC set:

- i) A customary allowance of 41 tonnes;
- ii) A recreational allowance of 41 tonnes;
- iii) An allowance for other fishing-related mortality of 3 tonnes; and
- iv) A TACC of 253 tonnes.

- i) **Agrees** to set a TAC of 2 tonnes for SPD10 and within that TAC set:

- i) A customary allowance of 1 tonne;
- ii) A recreational allowance of 1 tonne;
- iii) An allowance for other fishing-related mortality of 0 tonnes; and
- iv) A TACC of 0 tonnes.

- j) **Agrees** to amend the Sixth Schedule of the 1996 Act to include spiny dogfish as a species that may be returned to sea.

- k) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns for spiny dogfish.
- l) **Agrees** to set deemed values for spiny dogfish at \$0.30 per kg.
- m) **Notes** that a carry forward of 10 % of ACE is proposed for spiny dogfish.

ANNEX ONE

Sixth Schedule - add spiny dogfish to this schedule

Problem definition

- 46 Managing spiny dogfish within the QMS will result in some fishers facing additional costs if all spiny dogfish is required to be landed (as is normally the case for QMS stocks). This is because spiny dogfish is caught in high volumes but is often of low value. The tough skin and spines of spiny dogfish make processing into fishmeal difficult. Some fishers have expressed concern that catches of spiny dogfish will take up valuable freezer space at sea only to be dumped in landfills once vessels return to port. Under these circumstances, there would be strong incentives to dump and not report spiny dogfish catch.
- 47 The previous Minister and MFish have stated they favour an approach that avoids or reduces the costs associated with landing unwanted spiny dogfish and allows operators to choose whether to land spiny dogfish or whether to return them to the sea. MFish considers this will provide better reporting outcomes as it avoids incentives to dump and not report spiny dogfish catch.
- 48 The Sixth Schedule provides a regulatory exemption to allow spiny dogfish to be returned to sea, despite this being generally prohibited for QMS species.

Preliminary consultation

- 49 MFish undertook preliminary consultation with stakeholders on this issue during the process of seeking of submissions on introducing spiny dogfish into the QMS.

Options

- 50 It is proposed there are four potential options as set out below (refer Table 1). However, as described below, MFish considers only Option 1 and Option 3 are feasible in practice.

Table 1: Potential management options for spiny dogfish.

Option
Option 1: Default: No specific measures allowing spiny dogfish to be returned to sea
Option 2: Can return to sea if alive. Not counted against ACE
Option 3: Can return to sea whether alive or dead. Counted against ACE
Option 4: Can return to sea whether alive or dead. Not counted against ACE

Non-Regulatory Measures

- 51 The non-regulatory measure is the default setting for QMS stocks (Option 1 in Table 1). Spiny dogfish would be brought into the QMS without a regulatory measure allowing spiny dogfish to be returned to sea. This would not directly address the costs associated with landing unwanted spiny dogfish. However, these costs may be

reduced by changes in fishing practice or if operators take steps to reduce the volume of spiny dogfish landed by minimal on-board processing (for example, once finned or trunked, waste can be lawfully discarded).

- 52 Under this option, all mortality associated with commercial fishing of spiny dogfish will, in theory, be entirely constrained within the TACC as all spiny dogfish caught will be landed and counted against ACE (or attract deemed values). In practice, however, it is likely that substantial unreported (illegal) dumping of spiny dogfish would occur due to the economic cost of landing unwanted spiny dogfish, making estimation of total fishing-related mortality difficult. For this reason, and because this approach does not address the key issues identified for this fishery, MFish does not favour this approach.

Regulatory Measures

- 53 Under Options 2, 3 and 4 (refer Table 1) a regulatory exemption would be implemented under the Sixth Schedule, allowing spiny dogfish to be returned to sea, despite this being generally prohibited for QMS species. This would allow operators to choose whether to land unwanted spiny dogfish or whether to return them to the sea and thereby avoid costs associated with landing low value spiny dogfish. Such an approach should result in better reporting of spiny dogfish catches by reducing the incentive to illegally dump and not report.
- 54 The exemption could be either with (Option 2) or without (Options 3 and 4) the requirement that spiny dogfish be likely to survive return to the sea. In inshore trawl and long-line fisheries, some spiny dogfish may survive return to the sea, however, in deepwater trawl fisheries and on larger vessels, spiny dogfish are unlikely to survive. This variable survival would make it difficult to enforce the requirement that spiny dogfish only be returned if likely to survive. Furthermore, the economic cost of landing dead spiny dogfish remains if only live spiny dogfish can be returned to sea. Therefore, MFish favours allowing dead spiny dogfish to be returned to sea (Options 3 and 4).
- 55 Many of the species currently listed on the Sixth Schedule of the Act are robust species that survive capture. Therefore, catch of these species has been exempt from normal QMS balancing requirements in the past (however, refer Footnote 5). Allowing dead spiny dogfish to be returned to sea raises new policy issues. The intent, but not the wording, of the Sixth Schedule was primarily to provide for discarding of catch in circumstances where the relevant species were likely to survive. Additions to the schedule over the years have not necessarily followed this intent and MFish considers that the Sixth Schedule does provide for circumstances such as spiny dogfish where the policy objective is to allow fishers to choose whether to land spiny dogfish or whether to return them to the sea. As described below, MFish considers the more critical issue is that such catches be counted against ACE (Option 3 versus Option 4).
- 56 While there may be some additional incentive to dump and not report catches of spiny dogfish if discarded catches are counted against ACE (Option 3), the availability of ACE and the level of deemed values will determine the strength of this incentive. MFish considers there are significant advantages in constraining all spiny dogfish catch, including discarded catch, within the TACC by requiring discards to be counted

against ACE. For example, this approach provides individual operators with better incentives to maximise value/minimise costs associated with their spiny dogfish catch (for example by utilising previously discarded catch or actively avoiding spiny dogfish) than Option 4. Under Option 4, the estimated mortality due to discarding would be included within the TAC as 'fishing-related mortality', resulting in reduced spiny dogfish TACCs for all fishers, irrespective of their individual performance. Under Option 4, discarded spiny dogfish could exceed the TACC, given that disincentives to exceed the TACC operate at the fishery level rather than at the level of the individual fisher.

- 57 MFish, therefore, favours Option 3 and proposes this option be implemented by adding spiny dogfish to the Sixth Schedule and by making consequential amendments to the Fisheries (Reporting) Regulations 2001 to ensure discarded catch of spiny dogfish is recorded on Monthly Harvest Returns (and thereby counted against ACE). Proposed consequential amendments to the Fisheries (Reporting) Regulations 2001 are set out in Annex 2, however, their final form depends on the outcome of MFish's review of integration between the Sixth Schedule and the reporting regulations (refer Footnote 5).

Costs and benefits of the proposal

- 58 Adding spiny dogfish to the Sixth Schedule will allow operators to choose whether to land unwanted spiny dogfish or whether to return them to the sea and thereby avoid costs associated with landing low value spiny dogfish. Such an approach should also result in better reporting of spiny dogfish catches by reducing the incentive to illegally dump and not report.

Administrative implications

- 59 Species are added to the Sixth Schedule by Order in Council. This proposal also results in consequential amendments to the Fisheries (Reporting) Regulations 2001 (refer Annex 2). There are no significant administrative implications.

ANNEX TWO

Amendment to regulations

Consequential amendments to the Fisheries (Reporting) Regulations 2001

Background

- 60 It is proposed to make consequential amendments to the Fisheries (Reporting) Regulations 2001 by amending:
- a) Table 1 of Part 1 of Schedule 3 of those regulations that specifies the codes to be used when completing catch returns that must be furnished to the Chief Executive. This amendment will incorporate codes that reflect the QMA for spiny dogfish.
 - b) Destination code definitions and regulation 7(2)(a)(i) to ensure that discarded catch of spiny dogfish is recorded on Monthly Harvest Returns.
- 61 The Fisheries (Reporting) Regulations 2001 provide the framework for the completion and furnishing of statutory catch returns by fishers to the Chief Executive. Information contained in these returns is used for research, stock assessment, enforcement and administrative reasons (including balancing catch against ACE). With the revised QMAs established by the Minister, it is appropriate to amend these regulations to ensure that they reflect the Minister's decision establishing QMAs for spiny dogfish.
- 62 It is also necessary to ensure that destination codes correctly specify that discarded catches of spiny dogfish under the Sixth Schedule be reported on Monthly Harvest Returns (and therefore counted against ACE), reflecting the policy decisions in terms of spiny dogfish. The final form of the amendments depends on the outcome of MFish's review of integration between the Sixth Schedule and the reporting regulations (refer Footnote 5).

Problem definition

- 63 The obligations for fishers to report their catch and the codes used to complete these returns should reflect the Ministers decisions on QMAs and on the use of the Sixth Schedule for spiny dogfish.

Preliminary consultation

- 64 No direct consultation on the need to amend these regulations has been undertaken as it is a consequential amendment flowing from the Minister's QMA decision and Sixth Schedule decisions.

Options

- 65 As the reporting framework is contained in regulations, there is no other option than to amend these regulations.

Costs and benefits of the proposal

- 66 The proposed amendments clarify the obligations for fishers when completing their statutory returns. Regulatory clarification means fishers are aware of their reporting obligations and complete their returns in the simplest fashion possible.
- 67 Ensuring that destination codes require catches of spiny dogfish to be reported on Monthly Harvest Returns integrates the regulations with the Sixth Schedule decisions for spiny dogfish.

Administrative implications

- 68 Minor amendments to forms and explanatory notes will be required consequential to this regulatory amendment.

ANNEX THREE

Species Information

Species Biology

- 69 Spiny dogfish are widely distributed around the South Island and seasonally extend as far north as Cape Reinga and East Cape on the west and east coasts of the North Island, respectively. Spiny dogfish are most common in depths of 50–150 m.
- 70 Low fecundity, late maturity and low natural mortality are attributes of spiny dogfish. Females do not reach maturity until about age ten and there are direct relationships between parent length and fecundity. Spiny dogfish produce litters of live young ranging in number from one to 19, following a gestation period of two years. Male spiny dogfish live for at least 21 years and females 26 years.
- 71 Spiny dogfish is a voracious and skilled predator that feeds on a wide range of species including *Munida*, krill, squid, crayfish and crabs.

Catch information

- 72 Spiny dogfish are taken as a bycatch of deepwater trawl in the jack mackerel, barracouta, hoki, red cod and squid fisheries. They are also taken by inshore trawlers, set netters and longliners targeting flatfish, tarakihi, gurnard and snapper. A small set-net target fishery for spiny dogfish follows migrations up the east coast of the South Island.
- 73 Reported catches of spiny dogfish have more than doubled over the past decade, increasing from 2 500-5 000 tonnes in the 1980s to 5 000-10 000 tonnes during the 1990s. The catch of spiny dogfish by FMA is shown in Table 1.

Table 1: Reported catch (t) of spiny dogfish by FMA and fishing year,

FMA	1	2	3	4	5	6	7	8	9	10	Other	Total
1982–83	4	0	151	131	2 089	81	145	66	7	-	-	2 675
1983–84	22	18	409	347	565	1 700	119	63	16	-	-	3 258
1984–85	21	12	557	481	451	1 899	90	48	10	-	-	3 569
1985–86	13	11	892	411	537	1 017	120	92	20	-	-	3 113
1986–87	64	18	1 048	162	1 002	29	501	296	27	-	-	3 147
1987–88	50	9	1 664	172	642	16	1 402	841	27	-	-	4 823
1988–89	341	16	1 510	168	771	7	633	132	11	-	-	3 589
1989–90	36	14	2 243	136	241	2	521	80	0	-	-	3 273
1990–91	129	14	2 987	513	1 708	14	883	67	0	-	-	6 316
1991–92	54	23	1 801	66	538	33	1 031	249	0	-	-	3 795
1992–93	50	9	2 128	218	817	22	1 163	366	0	-	-	4 773
1993–94	51	34	3 165	358	1 158	21	2 212	214	0	-	-	7 213
1994–95	84	47	2 883	363	606	37	1 205	196	0	-	-	5 421
1995–96	68	177	2 558	969	1 147	152	1 205	186	15			7 052
1996–97	30	159	2 428	1 287	764	120	1 517	235	7	1	1	6 555
1997–98	52	165	5 042	917	428	223	2 389	1 172	34	0	11	10 433
1998–99	45	488	3 148	1 048	1 996	154	1 902	74	<1	0	<1	8 424
1999–00	15	328	3 309	994	1 163	189	1 505	25	7	0	5	7 540
2000–01	38	336	4 355	1 075	1 389	212	1 310	54	16	0	28	8 811
2001–02	53	251	5 242	1 626	3 880	483	1 400	128	13	0	0	13 076
2002–03	24	293	4 786	1 266	2 715	410	1 024	138	19	0	0	10 675
Last 3 years	38	293	4 794	1 322	2 661	368	1 245	107	16	0	0	10 844
Last 10 years	46	228	3 692	990	1 525	200	1 567	242	11	0	5	8 520

- 74 Since 1982–83, the major stocks, in terms of catches, have been in FMAs 3, 5, and 7. However, in recent years, catches in FMA 4 have more than doubled. Catches from FMAs 5 and 6 were most important in the early 1980s, with 1 000–2 000 tonnes taken annually by factory trawlers. In more recent years, FMA 3 and, to a lesser extent, FMA 7 have become more important. The catch in both these areas is taken equally by factory trawlers and inshore fleets.
- 75 Catch in FMA 5 increased to 3 880 tonnes in 2001–02 and the fishery was closed for the last month of that year when a regulatory competitive catch limit for that area was breached. Catches were unlikely to be significantly reduced by this closure, however, as it occurred late in the fishing year and outside the main fishing period for spiny dogfish in FMA 5.
- 76 The catch in FMA 1 is unlikely to be spiny dogfish, which is considered to be virtually absent from the area. These catches should probably be attributed to *S. mitsukurii*.
- 77 It is known that a large amount of spiny dogfish (particularly small spiny dogfish) have been caught, discarded and not reported, and that a proportion of these will not have survived discarding. Reporting is likely to have improved recently, however, historical reported catches are likely to be underestimates.
- 78 Discarding occurs because of the low economic value and specialised handling and processing requirements for spiny dogfish. These requirements hamper fishers who are fishing for other commercial fish species. However, market demand for New Zealand spiny dogfish has increased in the past few years, due to the collapse of the US Atlantic spiny dogfish fishery, and there is now probably increased processing capacity for spiny dogfish in New Zealand. Increased market demand is likely to be

responsible for some of the increase in reported catch, but so could better reporting, or increased availability or abundance of spiny dogfish. Catches dropped somewhat during 2002–03, possibly as a result of market competition from Mexican-sourced spiny dogfish. For the 2002–03 fishing year, around one-third (3 579 tonnes) of all spiny dogfish caught (10 675 tonnes) was landed to a licensed fish receiver.

- 79 Spiny dogfish are frequently caught by non-commercial fishers but the species is not highly-regarded and spiny dogfish are seldom used. Estimated catches from the 2000 National Recreational Fishing Survey are set out for each QMA in Table 2 below. These numbers may under-estimate the catch as most recreational fishers discard spiny dogfish and not all diarists will have accurately recorded their catch.

Table 2: Estimated spiny dogfish catch taken by recreational fishers by SPD QMA from the 2000 National Recreational Fishing Surveys (tonnes).

QMA	SPD1	SPD3	SPD4	SPD5	SPD7	SPD8	SPD10
2000	39	115	-	8	31	41	-

Trawl survey data

- 80 Biomass indices from recent trawl surveys are available and are summarised in Table 3.

Table 3: Biomass indices (t) and coefficients of variation (c.v.) from the results of trawl surveys assuming vulnerability, areal availability and vertical availability equal 1. Note: because trawl survey biomass estimates are indices, comparisons between different seasons (eg. summer and winter ECSI) are not strictly valid

FMA	Area	Vessel	Trip Code	Date		Biomass	% c.v.
FMA 2	East coast North Island	Kaharoa	KAH9304	Feb-Mar	1993	963	78
			KAH9402	Feb-Mar	1994	988	47
			KAH9502	Feb-Mar	1995	658	25
			KAH9602	Feb-Mar	1996	1 026	51
FMA 3	East coast South Island - Winter	Kaharoa	KAH9105	May-Jun	1991	12 873	22
			KAH9205	May-Jun	1992	10 787	26
			KAH9306	May-Jun	1993	13 949	17
			KAH9406	May-Jun	1994	14 530	10
	East coast South Island - Summer	Kaharoa	KAH9606	May-Jun	1996	35 169	15
			KAH9618	Dec-Jan	1996-97	35 776	28
			KAH9704	Dec-Jan	1997-98	29 765	25
			KAH9809	Dec-Jan	1998-99	22 842	16
			KAH9917	Dec-Jan	1999-00	49 832	37
			KAH0004	Dec-Jan	2000-01	30 508	34
	Chatham Rise	Tangaroa	TAN9106	Jan-Feb	1992	2 390	14
			TAN9212	Jan-Feb	1993	2 220	11
			TAN9401	Jan	1994	3 449	13
			TAN9501	Jan	1995	2 841	21
			TAN9601	Jan	1996	4 969	11
			TAN9701	Jan	1997	9 570	14
			TAN9801	Jan	1998	5 724	17
			TAN9901	Jan	1999	8 551	13
FMA 4	Chatham Rise	Tangaroa	TAN0001	Jan	2000	8 905	9
			TAN0101	Jan	2001	9 586	9
			TAN0201	Jan	2002	6 600	8
			TAN9301	Feb-Mar	1993	36 023	13
FMA 5	Stewart/Snares Shelf	Tangaroa	TAN9402	Feb-Mar	1994	36 328	17
			TAN9502	Feb-Mar	1995	91 364	29
			TAN9604	Feb-Mar	1996	89 818	29
			TAN9301	Feb-Mar	1993	36 023	13
FMA 7	West coast South Island	Kaharoa	KAH9204	Mar-Apr	1992	3 919	15
			KAH9404	Mar-Apr	1994	7 145	7
			KAH9504	Mar-Apr	1995	8 370	10
			KAH9701	Mar-Apr	1997	5 275	13
			KAH0004	Mar-Apr	2000	4 777	12
			KAH0304	Mar-Apr	2003	4 446	15
FMA 9	West coast North Island	Kaharoa	KAH9111	Oct	1991	0	-
			KAH9410	Oct	1994	337	33
			KAH9615	Oct	1996	564	76

- 81 These surveys suggest biomass of spiny dogfish has increased in FMAs 3, 4 and 5 and shown no trend in other FMAs. Based on this data, recent catch levels would appear to be sustainable. However, the magnitude of some of the apparent increases, particularly on the Stewart/Snares Shelf and the winter east coast South Island surveys, suggests that some of the series are reflecting short term changes in availability rather than true changes in stock abundance. While the time series may pick up longer term changes in stock size, it is probably too short at present to do so.
- 82 Surveys show there are seasonal migrations of spiny dogfish along the east coast of the South Island. Spiny dogfish are most abundant in the southern part of the coast from October to April and more abundant to the north in May to September. It is also clear from summer trawl surveys of the area that there is a resident part of the population of spiny dogfish on the Stewart/Snares Shelf over the summer months. However, there have been no comparable series of seasonal surveys there and so it is presently unclear whether the east coast fish migrate south as far as the Stewart/Snares Shelf. Until more data becomes available, fish from the two areas should be treated as separate stocks.
- 83 Trawl surveys of the west coast South Island also show a strong seasonal component, being highest in summer and autumn and lowest in winter and spring. It is likely that some fish migrate north in winter, perhaps to the northern and southern Taranaki Bights, and Tasman Bay and Golden Bay. However, it is also clear from summer trawl surveys of the areas that there is a resident part of the population of spiny dogfish in the Taranaki Bights over the summer months. There is little commercial catch in FMAs 1, 2, 4, and 9, and little data on movement in or between these areas.

Research

- 84 Research to characterise spiny dogfish fisheries and determine appropriate methods to monitor or assess the status of spiny dogfish stocks is underway (SPD2002/01). A report from this research is due to be reviewed at an Inshore Working Group meeting on 15 March 2004. This review may inform final advice on sustainability measures for spiny dogfish as it enters the QMS, or it may provide a basis for future decisions on monitoring or sustainability measures for spiny dogfish.

SPINY DOGFISH (SPD) – FINAL ADVICE

Initial Proposal

- 1 It was proposed in the initial position paper (IPP) to set the following TACs, allowances for customary fishing interests, recreational interests and other sources of fishing-related mortality, and TACCs for spiny dogfish (*Squalis acanthias*)¹ being introduced into the QMS on 1 October 2004 (refer Table 1).

Table 1: Proposed TACs, Allowances, and TACCs for spiny dogfish (*Squalis acanthias*) in tonnes

Stock	TAC	Customary allowance	Recreational allowance	Other sources of fishing related mortality	TACC
SPD1	413	39	39	4	331
SPD3	5 075	115	115	51	4 794
SPD4	1 356	10	10	14	1 322
SPD5 option 1	3 076	8	8	31	3 029
SPD5 option 2	4 423	8	8	44	4 363
SPD7	1 645	31	31	16	1 567
SPD8	338	41	41	3	253
SPD10	2	1	1	0	0

- 2 This proposal was part of a package of measures regarding the introduction of spiny dogfish into the QMS. Other measures proposed for this stock are:
 - a) Including spiny dogfish on the Sixth Schedule to the 1996 Act so that spiny dogfish may be returned to the sea (but counted against ACE or deemed values);
 - b) Amending the reporting regulations to ensure that the appropriate fishstock code for spiny dogfish is used under the QMS; and
 - c) Setting a deemed value, but no overfishing threshold, and allowing a 10% carry forward of ACE for spiny dogfish.

Biological and Fishery Information

Submissions

- 3 Several submitters argue that there is a current sustainability risk to the spiny dogfish fishery, yet others are of the view that there are no sustainability risks.
- 4 Clients of **Brierley Business Development** question the statement in the IPP that the spiny dogfish fishery creates a “potential sustainability risk.” They, **A and K MacDonald, Triton Fisheries, Motupipi Fishing Company Ltd (MFCL), and Te Ohu Kai Moana (TOKM)** contend that the spiny dogfish fishery is currently under

¹ Spiny dogfish is identified by the three letter code SPD in the MFish information system

some degree of sustainability risk. Several submitters point to collapse of spiny dogfish fisheries overseas as examples and note that overseas demand for spiny dogfish is rising simultaneously with apparent targeting of large breeding females in New Zealand.

- 5 **MFCL** contends the very reason that spiny dogfish has been gazetted for entry into the QMS is that there is a sustainability risk. MFCL points out that the primary rationale given by the previous Minister in his declaration letter of 4 October 2003, to include spiny dogfish in the QMS, is “sustainability risk for spiny dogfish”.
- 6 **Triton Fisheries** is concerned about sustainability and notes that spiny dogfish in SPD3 and SPD7 used to be present throughout the year, but now seem to appear only in July, August, and September, and attribute this decline to only four target fishers.
- 7 **MFCL** recommends that MFish publish the catch landed/discard ratio in order to monitor the proportion of catch that are breeding females.
- 8 **MFCL** challenges the assertion in the IPP that the maximum sustainable yield (MSY) cannot be calculated for spiny dogfish and suggests that unpublished information held by NIWA can be utilised to calculate MSY.
- 9 **Sealord, Challenger Finfisheries Management Company Ltd, Area 2 Inshore Finfish Management Company Ltd., Sanford Ltd, New Zealand Federation of Commercial Fishermen, Inc.** and the **New Zealand Seafood Industry Council** contend that there are no current sustainability concerns with regard to spiny dogfish stocks in New Zealand.

MFish Discussion

- 10 The IPP contains a discussion of matters relating to the sustainability risk for spiny dogfish (refer IPP para 11 and Annex 3 of IPP para 13 and 16). MFish’s Inshore Working Group has now reviewed the characterisation report² referred to in the IPP (Annex 3 para 16). The report confirms that there is no evidence of a decline in catch rates for spiny dogfish, with the possible exception of SPD3 where there is some indication of a decline in set net catch rates over the last few years. There is evidence of increased spiny dogfish catch rates in other areas (particularly in SPD4). This assessment broadly supports the anecdotal observations from some fishers of no scarcity across most QMAs, but reduced abundance in some parts of SPD3 (Triton’s submission) and is consistent with MFish’s analysis throughout the process of QMS consideration that emphasised a potential rather than actual sustainability risk. As a result of the recommendations from the characterisation report, and an increased focus on monitoring of spiny dogfish stocks, MFish will be developing new research proposals for spiny dogfish for 2005-06.
- 11 In relation to the submission by Motupipi Fishing Company Ltd, estimates of Maximum Constant Yield (MCY) for spiny dogfish stocks made in 1997³ are not considered suitable for estimating MSY. Biomass estimates are not available for spiny

² SPD 2002-01: Characterisation of the spiny dogfish fisheries. NIWA report to MFish Inshore Working Group, March 2004.

³ A summary of biology and commercial landings, and a stock assessment of spiny dogfish (*Squalus acanthias*). S M Hanchet and J K V Ingerson. 1997. NZ Fisheries Assessment Research Document 97/6.

dogfish and, therefore, the 1997 MCY estimates relied on average catches during 1986–1994 and the assumption that catches were stable and accurately reported during this period. This is unlikely as spiny dogfish catch is considered to have been under-reported up until recently.

- 12 Also in relation to the submission by Motupipi Fishing Company Ltd, the proportion of spiny dogfish landed and discarded over the past three fishing years is set out later in this paper in Table 4.

Environmental Considerations

Submissions

- 13 **Sanford Limited** submits that, due to the low economic value of spiny dogfish, the requirement to land spiny dogfish might result in adverse environmental impacts because fishers would be forced to dump spiny dogfish that cannot be sold to processors into landfills.

MFish Discussion

- 14 The IPP contains a discussion of matters relating to environmental considerations (refer IPP para 44 a), f) and g)). In relation to Sanford Limited's submission, the IPP proposed that unwanted spiny dogfish be able to be returned to sea (refer IPP 36-37).

TAC, Allowances and TACC setting considerations

Submissions

Customary and recreational allowances

- 15 **A and K MacDonald** and **Triton Fisheries** support the customary and recreational allowance for each spiny dogfish fishery as given in the IPP.

Other sources of fishing-related mortality allowances

- 16 **A and K MacDonald** and **Triton Fisheries** support the allowance for other sources of fishing-related mortality for each spiny dogfish fishery as given in the IPP.

TACs and TACCs

- 17 **Motupipi Fishing Company Ltd (MFCL)** urge that caution be exercised in setting TACs and request that MFish recognise that failed overseas management of spiny dogfish has resulted in widespread collapse of spiny dogfish fisheries.
- 18 Clients of **Brierley Business Development (BBD)**, **A and K MacDonald**, and **Triton Fisheries** argue that basing the TACC on the highest catch year for any QMA is unacceptable. **BBD** contends that such high TACCs could lead to overfishing in some QMAs to the detriment of the fishery in adjacent QMAs.

- 19 **Sanford Ltd, White Cloud Seafoods Christchurch, Ltd, and MFCL** are of the view that the same methodology should be employed in each QMA when setting the TACCs.
- 20 **A and K MacDonald, BBD, MFCL and Triton Fisheries** contend that the 3- or 10-year reported catch averages must be used for all initial TACCs.
- 21 **A and K MacDonald, BBD, MFCL and Triton Fisheries** note that, for SPD5, the IPP suggests two options for setting the TACC. Because catches in this fishery have fluctuated greatly, the IPP suggested using either the average of the last three fishing years or a higher TACC based on the 2001-02 fishing year catch. These submitters vigorously oppose the higher TACC and favour the three-year catch average.
- 22 **Sealord** supports setting the TACCs at maximum levels.
- 23 **Te Ohu Kai Moana (TOKM), Sanford Ltd and the New Zealand Seafood Industry Council** are of the view that the TACCs should be set at the single highest reported fishing-year catch over the previous ten years. SeaFIC points out that historic discarding and non-reporting in the spiny dogfish fishery has resulted in conservative three and ten-year average catch figures.
- 24 **TOKM**, however, submits that, given the potential sustainability risk for spiny dogfish, TACCs be reviewed after a period of no more than five years to ensure that management objectives for spiny dogfish are being met.
- 25 **New Zealand Federation of Commercial Fishermen, Inc** propose that the TACCs be set at the current catch rates in order to encourage reporting and to provide sufficient ACE to cover the catch.
- 26 **Challenger Finfisheries Management Company Ltd** argues that the ten-year catch average for SPD7 (1567 tonnes) should not be utilised in setting the TACC. CFMCL contends that the 1997-98 fishing year reported catch of 2 389 tonnes is more appropriate. Using similar arguments, CFMCL argues that the TACC for SPD8 should be set at 1 172 tonnes.
- 27 **Southeast Finfish Management Ltd** suggests setting the TACC for the spiny dogfish fisheries at the highest level of recorded catch plus 25% in order to account for historic underreporting.

MFish Discussion

Customary and recreational allowances, allowance for other sources of fishing-related mortality

- 28 Submissions supported the customary allowances, recreational allowances and the allowance for other sources of fishing-related mortality proposed in the IPP (refer IPP para 24–32). MFish confirms that its position on customary and recreational allowances remains as stated in the IPP. Given that allowances for other sources of fishing-related mortality are based on 1% of the TACC, and that final TACC recommendations for SPD4, SPD5, SPD7 and SPD8 differ from those in the IPP (refer following section), this allowance has been adjusted for these as set out in the recommendation section.

TACs and TACCs

- 29 The IPP contains a discussion of matters relating to the setting of TACs and TACCs (refer IPP para 9–34). Most submitters commented on these proposals. In general, commercial stakeholder organisations and large companies taking spiny dogfish as a bycatch argued for a higher TACC than those in the IPP whereas target fishers and processors tended to support most TACC levels in the IPP.
- 30 MFish noted in the IPP that the biological characteristics of spiny dogfish, the large bycatch of spiny dogfish, and its value as a target species indicate a potential rather than an immediate sustainability risk. The current level of spiny dogfish stocks in relation to the level that would produce MSY (B_{msy}) is not known. Trawl surveys and the assessment of catch rates just completed⁴ suggest catches over the past decade have been sustainable, however, reported catches have increased over the past few years. It is not known if these increased catch levels are sustainable in the longer-term or if they will move spiny dogfish stocks towards B_{msy} as required by s13. MFish believes that TACs should be set at or around recent higher catch levels pending the provision of better information anticipated from management under the QMS and an extended period of fishing at the higher reported catch levels seen in the last few years. To ensure spiny dogfish stocks are adequately monitored, MFish intends to develop new research projects relating to spiny dogfish for the 2005-06 year.
- 31 Some submitters support the approach taken in the IPP, or argue for a more conservative approach, while others consider continued under-reporting in recent years means the TACs/TACCs proposed in the IPP do not accurately reflect current catch levels. SeaFICs', TOKM's and Sanfords' approach of basing TACCs on the maximum reported commercial catch was considered in the IPP (para 15-16). However, in the IPP, MFish preferred (with the exception of SPD5) to utilise average catch over the past three years (or last 10 years in the case of SPD7 and SPD8) as being more representative of current catch. Using average catches also has the advantages of smoothing any unusual catches and being more consistent with the generic criteria used by MFish for setting TACs and TACCs (page 15-16 of IPP).
- 32 MFish notes that the generic criteria are guidelines and are only intended to provide a starting point from which an assessment of sustainability risk and utilisation potential can be considered. Within the broad objective of setting TACs at or around recent higher catch levels, maximum reported recent catch may also be a viable alternative for some spiny dogfish stocks and is consistent with the criteria in s13. Table 2 sets out the differences between TACCs based on maximum reported commercial catches and the TACCs proposed in the IPP.

⁴ SPD 2002-01: Characterisation of the spiny dogfish fisheries. NIWA report to MFish Inshore Working Group, March 2004.

Table 2: Differences between proposed TACCs based on maximum reported commercial catches⁵ and the TACCs proposed in the IPP (tonnes)

Stock	IPP TACC	Maximum Catch TACC	Difference
SPD1	331	572	241
SPD3	4 794	5 242	448
SPD4	1 322	1 626	304
SPD5 option 1	3 029	4 363	1 334
SPD5 option 2	4 363	—	—
SPD7	1 567	1 902 ⁶	335
SPD8	253	307 ⁷	54
SPD10	0	1	1

- 33 Increases would be largest for SPD5 (under IPP option 1), SPD3, SPD7, SPD4 and SPD1. There is relatively little change for SPD8 or SPD10. Option 2 for SPD5 in the IPP already utilises maximum reported catch.
- 34 MFish does not support using maximum reported catch in SPD1 as it is believed that much of the catch historically reported as spiny dogfish in this QMA is likely to be northern spiny dogfish. MFish also does not support using maximum reported catch in SPD3 given indications of a decline in catch rates in the SPD3 set net fishery⁸. While there is no evidence of an immediate sustainability concern for these stocks, taking into account the information principles of the Act (s10) and the low biological productivity of spiny dogfish, TACs and TACCs based on the average catch over the last three years for SPD1 and SPD3 are more likely to maintain these stocks at or above B_{msy} .
- 35 Trawl surveys and catch rates in SPD 4 indicate a steady increase in abundance over the past 10 years. Using maximum reported catch (2001-02 fishing year) as the basis for setting the TAC and TACC is a viable option, which appears likely to maintain this stock at or above B_{msy} , given the relatively modest increase involved and the absence of any evidence of current sustainability concern. MFish recommends the TACC for SPD 4 be based on maximum reported commercial catch, increasing the TACC and TAC from that proposed in the IPP to 1626 tonnes and 1662 tonnes respectively.
- 36 There is also evidence of increased abundance in SPD 5 from trawl surveys and catch-rate data, however, spiny dogfish are believed to migrate between SPD 5 and SPD 3. Using maximum reported commercial catch for SPD 5 may, as argued by some submitters, create an additional sustainability risk for SPD 3, given the magnitude of the increase. MFish also notes that the maximum reported catch for SPD 5 in 2001-02

⁵ Maximum reported catch since 1994-95 fishing year

⁶ The NIWA characterisation of the spiny dogfish fisheries (see footnote 4) has highlighted errors in catch returns presented in the IPP (Table 1 Appendix 3) for the fishing year 1997-98. Catch for SPD7 for this fishing year is believed to be over-reported by 1129t.

⁷ The NIWA characterisation of the spiny dogfish fisheries (see footnote 4) has highlighted errors in catch returns presented in the IPP (Table 1 Appendix 3) for the fishing year 1997-98. Catch for SPD8 is believed to be over-reported by 899t respectively.

⁸ SPD 2002-01: Characterisation of the spiny dogfish fisheries. NIWA report to MFish Inshore Working Group, March 2004.

is over 1 100 tonnes higher than any previous year, may not represent likely future catches, and is already included in the Option 1 proposal as a component of the average catch over the last three years. Having regard to the potential interdependence of the SPD 3 and SPD 5 stocks (s13(2)(a)), but noting the evidence of increased abundance in SPD 5, MFish recommends the TACC and TAC be set at 3 700 tonnes and 3 753 tonnes, respectively.

37 There is no trend in abundance evident for SPD 7 or SPD 8. In the absence of any evidence of a current sustainability concern and given the relatively small amounts involved, MFish considers increasing the TACC and TAC from that proposed in the IPP (based on average catch over the last ten years) to the highest recorded catch for SPD 7 (during 1998-99) and SPD 8 (during 1997-98) should maintain these stocks at levels at or above B_{msy} .

38 MFish recommends the TACCs and TACs shown in Table 3 below.

Table 3: Comparison of IPP and FAP TACC recommendations (tonnes). Table also shows average commercial catch over the last three years.

Stock	Average catch for last 3 years	IPP TACC	FAP TACC
SPD1	331	331	331
SPD3	4 794	4 794	4 794
SPD4	1 322	1 322	1 626
SPD5 option 1	2 661	3 029	3 700
SPD5 option 2	—	4 363	—
SPD7	1 245	1 567	1 902
SPD8	123	253	307
SPD10	0	0	0

Social, Cultural and Economic Factors

Submissions

39 There is considerable disagreement on the economic value of the spiny dogfish fishery and the costs of managing spiny dogfish in the QMS. Several submitters state that spiny dogfish is a very low value fishery and imposing QMS management for spiny dogfish will result in an economic cost whereas other submitters comment that they enjoy a robust overseas market for spiny dogfish products that is likely to grow in the near future.

40 **A and K MacDonald, Triton Fisheries and White Cloud Seafoods Christchurch Limited** state that a market already exists for considerably more landed spiny dogfish and that there is an emerging and potentially very lucrative market for a range of spiny dogfish products, including fins in Asia and in Europe. These submitters collectively note that fin prices are approximately \$9/kg, trunks, eggs, and spines are worth approximately \$1.50/kg and current port prices are in the range of \$0.60–\$0.85/kg for whole spiny dogfish.

41 **Amaltal Fishing Company Ltd** contends that spiny dogfish is a worthless product.

- 42 **Sealord** states that up to two-thirds of spiny dogfish catch is discarded at sea and, therefore, carries no economic value.

MFish Discussion

- 43 The IPP contains a discussion of other matters relating to social, cultural and economic factors (refer IPP para 7, 36, 44 c) and e)). Given the management measures proposed in the IPP to allow unwanted spiny dogfish to be returned to sea, the primary economic cost to fishers of managing spiny dogfish within the QMS is the transitional, short-term cost of obtaining ACE/quota to cover catch. While there will be economic implications for individuals, there is substantial provisional catch history for spiny dogfish⁹, therefore, the economic cost to fishers of obtaining ACE/quota should be close to neutral overall.

Other Management Measures

Submissions

Sixth Schedule

- 44 Submitters are in general agreement that, at this time, listing spiny dogfish on the Sixth Schedule with provision for return-to-sea dead or live is an appropriate management measure. Some submitters argue, however, that long-term inclusion of spiny dogfish on the Sixth Schedule will be harmful to the fishery and to the intent of spiny dogfish management under the QMS. There is also disagreement regarding whether returned spiny dogfish should be counted against ACE.
- 45 Clients of **Brierley Business Development** have strong reservations about listing spiny dogfish on the Sixth Schedule with provision of live or dead return-to-sea. They suggest that spiny dogfish remain on the schedule for no longer than 5 years. They argue that a five-year timeframe would allow a period of adjustment for the industry but that longer-term inclusion of spiny dogfish on the Sixth Schedule would compromise the entire rationale for placing spiny dogfish in the QMS. **Motupipi Fishing Company Ltd (MFCL)** expresses concern with future sustainability if spiny dogfish remain on the Sixth Schedule for long periods because fishers will elect to land larger females which command higher port prices.
- 46 **A and K MacDonald, Triton Fisheries, White Cloud Seafoods Christchurch Limited, MFCL, Southeast Finfisheries Management Company, Ltd, Te Ohu Kai Moana, and New Zealand Seafood Industry Council** support inclusion of spiny dogfish on the Sixth Schedule with provision for return-to-sea dead or alive provided all discarded catch is counted against ACE.
- 47 **Sealord Ltd, Challenger Finfisheries Management Company Ltd, MFCL and New Zealand Federation of Commercial Fishermen, Inc.** support listing spiny dogfish on the Sixth Schedule with provision for return-to-sea dead or alive.

⁹ Spiny dogfish provisional catch history is estimated to be equivalent to approximately 80% of TACCs proposed in the IPP

- 48 **Amaltal Fishing Company Ltd** strongly opposes counting returned or landed spiny dogfish against quota and buying ACE to cover catches of spiny dogfish, and threatens court action.

Market value, deemed value category, and overfishing threshold

- 49 Several submitters commented on the intent expressed in the IPP to classify spiny dogfish as a 'low knowledge fishstock' rather than place spiny dogfish in the "all other fishstocks" category. In general, larger commercial stakeholder organisations support using the 'low knowledge fishstock' category whereas target fishers and processors prefer using "all other fishstocks".
- 50 **Brierley's Business Development (BBD), A and K MacDonald, Triton Fisheries, Motupipi Fishing Company Ltd (MFCL) and White Cloud Seafoods Christchurch Ltd** contend that spiny dogfish is not a 'low knowledge fishstock'. These submitters argue that spiny dogfish is under a sustainability threat; 20 years of catch records exist and ample published biological data are available. Therefore, spiny dogfish is not a low knowledge fishstock and should be categorised in the "all other fishstocks".
- 51 **Challenger Finfisheries Management Company Ltd** and the **New Zealand Federation of Commercial Fishermen Inc.** contend that spiny dogfish belongs in the "low knowledge" category.
- 52 **New Zealand Seafood Industry Council (SeaFIC)** is of the opinion that adopting the 'all other fishstocks category' rather than the "low knowledge fishstock" would create disincentives to accurate reporting due to higher deemed value and the potential for imposed differential deemed values.
- 53 Many submitters commented on the assignment of port price and an initial deemed value. As with deemed value category, some organisations and fishers argued for a low deemed value (to induce accurate reporting) with no differential deemed value and no overfishing threshold whereas others argued that the port price is higher and therefore a higher deemed value is appropriate.
- 54 **BBD** and **MFCL** contend that the \$0.50 port price put forward in the IPP is too low. **A and K MacDonald** similarly argue that \$0.50 is too low and contend that the port price should be set on LFR data from November to December 2003, from LFRs that actually processed spiny dogfish.
- 55 **White Clouds Seafoods Christchurch Ltd** state that they pay a port price of \$0.60. **MFCL** is of the opinion that a more accurate port price is around \$0.80 per kg and should be reflected in the initial deemed value.
- 56 **SeaFIC** argues that two thirds of spiny dogfish catch is historically discarded and has no market value and, consequently, is not reflected in the port price.
- 57 **A and K MacDonald** and **Triton Fisheries** are of the view that the deemed value should be in the range of \$0.15 – 0.30/kg.
- 58 **SeaFIC** and **New Zealand Federation of Commercial Fisherman Inc** are of the view that deemed values must be set low enough that they provide incentive to accurately report spiny dogfish catches.

- 59 **Challenger Finfisheries Management Company** argues that spiny dogfish should have a very low deemed value, no differential deemed value, and ability to carry forward 10% of ACE.
- 60 **Amaltal Fishing Company Ltd** submits that if the deemed value is near \$0.30/kg, as suggested in the IPP, it imposes an economic cost to them because spiny dogfish is a worthless product.
- 61 **SeaFIC, Sanfords Ltd, and Te Ohu Kai Moana (TOKM)** oppose using a proportion of port price to set deemed values. SeaFIC contends that the relationship between ACE and port price is likely to be weak for spiny dogfish.
- 62 **SeaFIC, TOKM and New Zealand Federation of Commercial Fishermen Inc** propose that the deemed value be set marginally above the combined value of ACE and transaction costs associated with acquiring ACE. SeaFIC suggests such a price would be in the order of \$0.03/kg.
- 63 **Sanford Ltd** suggests the deemed value be set at \$0.30/kg until 90% of the TACC is taken at which time the deemed value falls to \$0.03/kg, and that any deemed values collected be returned to the quota holders.
- 64 **MFCL** proposes a two-tier deemed value that would set a low deemed value on total discards and another deemed value that reflects the return on landed products. The rationale is that such a system would stop the practice of finning—only and encourage landing of the whole fish.
- 65 **Area 2 Inshore Finfish Management Company (A2IFMC) and Southeast Finfish Management Company Ltd** submit that the deemed value be \$0.00.
- 66 **A2IFMC** further argue that fishers must have an option not to land spiny dogfish. If spiny dogfish are returned to the sea with a likelihood of survival, such fish should not count against quota. **A2IFMC** and **SeaFIC** contend that, if the deemed value is greater than \$0.00, it is inevitable that non-reported discarding will take place. A deemed value of \$0.00, however, provides incentive to accurately report catch.
- 67 **SeaFIC** opposes utilising deemed values as an incentive to land spiny dogfish.
- 68 **A and K MacDonald and Triton Fisheries** submit that the deemed value should increase when quota is exceeded in order to encourage leasing of ACE and landing of whole spiny dogfish.
- 69 **TOKM** recommends that, regardless of the initial deemed value, a review of the deemed value take place no later than five years time to ensure that the intended management objectives for spiny dogfish are achieved.

MFish Discussion

Sixth Schedule

- 70 Submissions generally support the addition of spiny dogfish to the Sixth Schedule of the 1996 Act, with all catch, including discarded catch, to be subject to ACE/deemed values. MFish notes the concern raised by some submitters regarding use of this

provision over the longer-term. However, MFish reviews all QMS fisheries routinely to determine stock status and is able to adjust management measures, including this provision, if required. MFish does not consider it is necessary to set a specific timeframe for removing spiny dogfish from the Sixth Schedule. MFish confirms that its position on the Sixth Schedule remains as stated in the IPP (para 36-37 and Annex 1).

Market value, deemed value category, and overfishing threshold

- 71 Submitters are polarised on the market value of spiny dogfish and the most appropriate settings for deemed values. There is substantial provisional catch history for spiny dogfish and the level at which the deemed value is set will influence the market value of ACE and quota. Therefore, there are incentives for fishers with catch history, who in some cases may no longer be active in the fishery, to argue for higher deemed values (and lower TACCs) to maximise the value of their quota and ACE holdings. Conversely, fishers without catch history may consider that their financial interests are best served by arguing for a low deemed value (and higher TACCs).
- 72 The IPP contains a discussion of matters relating to the setting of deemed values (refer IPP para 39-43). The IPP proposed a deemed value of \$0.30 per kg for spiny dogfish based on the port price of landed spiny dogfish of \$0.50 and a factor of 0.6 for low knowledge category of fishstocks. However, the IPP noted the difficulty in establishing market value and an appropriate deemed value for spiny dogfish stocks and called for submissions on this issue.
- 73 The primary purpose of a deemed value is to set an economic incentive for a fisher to cover his or her catch with ACE (s75(2)(a)). This provides an incentive to ensure catch of that stock is within sustainable limits (the TACC). To achieve this incentive, the deemed value needs to be greater than the marginal cost to the fisher of obtaining ACE, and this cost will differ depending on the particular management characteristics of the fishery. The deemed value may also (s75(2)(b)(i)) be set at a level which encourages a fisher to land his or her catch, for example, set at less than the price the fisher will receive when landing his or her catch (the port price).
- 74 For many stocks, the marginal cost of ACE can be inferred from the ACE markets. However, for stocks entering the QMS there is no established ACE market and, therefore, the value of ACE must be estimated. The Ministry has used a percentage of the port price as an acceptable arbitrary market point for deemed values. As outlined in the IPP, however, it is difficult to determine a port price for spiny dogfish upon which to base a deemed value. As most spiny dogfish catch is currently discarded (see Table 4), the ACE market is unlikely to accurately track the surveyed port price since it relates only to the landed component of the total catch.
- 75 It is intended that low value or unwanted spiny dogfish can be discarded within the QMS, but that all discarded catch be subject to ACE or deemed values (due to high mortality during discarding, refer IPP para 36-37). In such a situation, a deemed value based on the landed port price is unlikely to reflect the market value for ACE as it does not take into account the influence of the discarded catch on the ACE market.

Table 3: Proportion of spiny dogfish catch landed for past three fishing years.

Fishing Year	Landed to LFR ¹⁰ (t)	Discarded ¹¹ (t)	Total (t)	Proportion Landed/Total
2000-01	3 187	5 582	8 811	0.36
2001-02	5 275	7 772	13 076	0.40
2002-03	3 579	7 096	10 675	0.34
3-year average	4 022	6 808	10 844	0.37

- 76 Based on submissions from those currently discarding spiny dogfish, discarded spiny dogfish has little or no market value. They submit it is not possible to process and market the large volumes of predominantly smaller spiny dogfish involved and that much of this catch would be dumped in landfills were it not able to be discarded at sea.
- 77 Other submitters maintain there is a market for the majority of spiny dogfish catch, even if only as fins. They submit the value of spiny dogfish fins is \$9 per kg or \$0.30 per kg greenweight fish¹². MFish has little reliable information on the value of spiny dogfish fins, but notes that their small size and low needle content means they are lower in value than pelagic sharks¹³. Other anecdotal information suggests prices may be as low as \$3 per kg (\$0.10 per kg). It is clear, however, that if the deemed value is set low, no barrier will be created to land additional spiny dogfish to the market.
- 78 Unless artificially maintained by a high deemed value, real market demand for ACE will only come from the relatively small proportion of fishers utilising and landing their catch. Given the majority of catch is currently discarded and has little or no market value, the availability of spiny dogfish ACE will exceed real market demand. Inevitably, this will drive the ACE market further towards zero. Under these circumstances, port price, even a modified port price, will be a poor indicator of the value of ACE.
- 79 The above discussion suggests the use of port price and fishstock categories may not be an appropriate way to determine deemed values given the regime proposed for spiny dogfish.
- 80 SeaFIC and others submit that the deemed value for spiny dogfish should be set marginally above the cost recovery and transaction charges associated with acquiring spiny dogfish ACE. On this basis, they submit the deemed value should be \$0.015 per kg plus a margin of another \$0.015 per kg to encourage fishers to cover their catch with ACE. This proposal gives a total annual deemed value of \$0.03 per kg for spiny dogfish.
- 81 MFish agrees with SeaFIC and other submitters that the deemed value for spiny dogfish should not:

¹⁰ Destination code "L"

¹¹ Destination code "D"

¹² Using a conversion factor for fins of 30:1

¹³ Review of Shark Finning in Australian Waters. Report to Fisheries Resources Research Fund by Bureau of Rural Sciences. 2001

- discourage accurate reporting (ie by encouraging fishers without ACE to illegally discard and not report spiny dogfish catch);
 - impose unnecessary costs on industry; and
 - artificially distort the market value of ACE by being set at an unnecessarily high level.
- 82 Taking into account the factors discussed above, and in light of the fact that there are no immediate sustainability concerns associated with spiny dogfish, MFish recommends an annual deemed value based on the cost recovery and transaction charges associated with acquiring spiny dogfish ACE. A deemed value set at a margin above these combined costs should provide an incentive for fishers to cover their catch with ACE as required by s75(2)(a) because the cost of obtaining ACE should be less than the cost of paying deemed values.
- 83 Current transaction charges are \$29.95 per line transfer and \$3 per line thereafter or, if done electronically, a flat rate of \$16.95. The likely volume of spiny dogfish ACE transactions is unknown. Current non-ITQ cost recovery levies for spiny dogfish are \$15.91/tonne, however, as noted elsewhere in this paper, MFish recommends an increased research and monitoring focus on spiny dogfish stocks in the future to better monitor status of the stocks and identify sustainability risks for spiny dogfish. Initiating new research projects for spiny dogfish is likely to increase spiny dogfish cost recovery levies in the near future.
- 84 Given these cost recovery and transaction charges, MFish recommends the deemed value be set at \$0.05/kg. A deemed value set at this level:
- should encourage catch to be covered with ACE ;
 - is low enough not to provide a disincentive for fishers not to report landings;
 - takes into account that most (60%) spiny dogfish is currently not landed (s75(2)(b)(iii)) and may have little value;
 - allows the fishing industry to obtain maximum economic benefit from spiny dogfish without compromising its ability to efficiently harvest other stocks taken with spiny dogfish (s75(2)(b)(iv)).
- 85 As set out in the IPP, MFish does not recommend differential deemed values or overfishing thresholds be set for spiny dogfish stocks.
- 86 MFish will monitor the amount of spiny dogfish catch covered by ACE over the medium term. If necessary, MFish will review the deemed value for spiny dogfish to ensure it is providing sufficient incentive for catch to be covered by ACE and the other objectives of s75. Conversely, information from the ACE market and other sources may indicate the deemed value is distorting the ACE market. Under these circumstances, the deemed value for spiny dogfish will also be reviewed.
- 87 Section 75 of the Act does not provide for the setting of a two-tier deemed value system on discards and landed products as proposed by MFCL. Furthermore, such an approach would seem to provide a disincentive to land spiny dogfish contrary to

s75(2)(b). Nor does the statute provide for revenue from deemed values to be distributed to quota holders, in the manner proposed by Sanford.

- 88 The recommended deemed value is based on the cost recovery and transaction charges associated with acquiring spiny dogfish ACE, rather than use of a particular fishstock category (refer submissions by BBD, MFCL and others).

Other issues

Submissions

Allocation

- 89 **Sealord** contends that spiny dogfish has long been a problem fish for freezer trawl, longline fleets, and fresh fish vessels. There has been much unreported catch in the years over which individual catch history is to be allocated and such fishers will be disadvantaged with respect to allocation. **Sealord** is of the view that both TACC and ITQ be set on a similar basis in order that ITQ go to fishers rather than to the Crown as windfall gain through tendering.
- 90 **Triton Fisheries** is of the view that such fishers were negligent in not reporting their past catch and are now seeking to force a low deemed value and low port price in order to facilitate low-cost entry into the fishery.

MFish Discussion

- 91 Issues related to allocation of Provisional Catch History are outside the scope of this paper. The allocative implications of setting TACs and TACCs have been considered as part of setting the TAC.

Legal Obligations

- 92 The statutory considerations that must be taken into account when setting TACs and allowances for spiny dogfish were identified in the IPP (refer to IPP para 44). No additional information has come to hand regarding these considerations. Except as discussed in the relevant parts of this paper, MFish confirms that its position on legal obligations remain as stated in the IPP.

Conclusion

- 93 Submissions received on proposals differ in terms of the current status and appropriate management settings for spiny dogfish stocks. There is some disagreement on whether the TACs and TACCs for spiny dogfish stocks should be lower or higher than proposed in the IPP.
- 94 While there is agreement from most submitters that unwanted spiny dogfish should be able to be returned to sea, and that discarded catch should be subject to ACE/deemed values, there is disagreement concerning the deemed value that should apply. This stems in part from disagreement over the market value of spiny dogfish and the capacity of fishers to utilise spiny dogfish.

95 Taking into account these submissions, MFish considers that the proposals contained in the IPP form the basis for final decisions with the following exceptions:

- For most SPD stocks, average catches for the past three or ten years are representative of current catch and have the advantage of smoothing inter-annual variation. However, trawl surveys and recent catch-rate data for SPD4 and SPD5 point to an increase in abundance of spiny dogfish. MFish recommends the TACC for SPD4 be based on maximum reported commercial catch (2001-02 fishing year), increasing the TACC and TAC from that proposed in the IPP to 1 626 t and 1 662 t, respectively. MFish recommends the TACC and TAC for SPD5 be set at 3 700 and 3 753 t, respectively. In the absence of any evidence of a sustainability concern, MFish also recommends the TACCs and TACs for SPD7 and SPD8 be based on maximum recent catches increasing them slightly to 1 902, 1 983, 307 and 392 t, respectively. Based on available information, these catch levels should maintain these stocks at or above a level that will produce maximum sustainable yield (s13).
- As indicated in the IPP, the large proportion of spiny dogfish currently discarded and the QMS regime to be implemented for spiny dogfish means the use of port price and fishstock categories is not an appropriate way to determine deemed values. MFish recommends deemed values be based on the cost recovery and transaction charges associated with acquiring spiny dogfish ACE. Given current cost recovery and transaction charges and based on an assumption of increased research costs for spiny dogfish, MFish recommends the deemed value be initially set at \$0.05/kg but reviewed in the future.

Recommendations

96 MFish recommends that you:

- a) **Agree** to set TACs for spiny dogfish pursuant to s 13 of the 1996 Act.
- b) **Agree** to set a TAC of 413 tonnes for SPD1 and within that TAC set:
 - i) A customary allowance of 39 tonnes;
 - ii) A recreational allowance of 39 tonnes;
 - iii) An allowance for other fishing-related mortality of 4 tonnes; and
 - iv) A TACC of 331 tonnes.
- c) **Agree** to set a TAC of 5 075 tonnes for SPD3 and within that TAC set:
 - i) A customary allowance of 115 tonnes;
 - ii) A recreational allowance of 115 tonnes;
 - iii) An allowance for other fishing-related mortality of 51 tonnes; and
 - iv) A TACC of 4 794 tonnes.
- d) **Agree** to set a TAC of 1 662 tonnes for SPD4 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 10 tonnes;

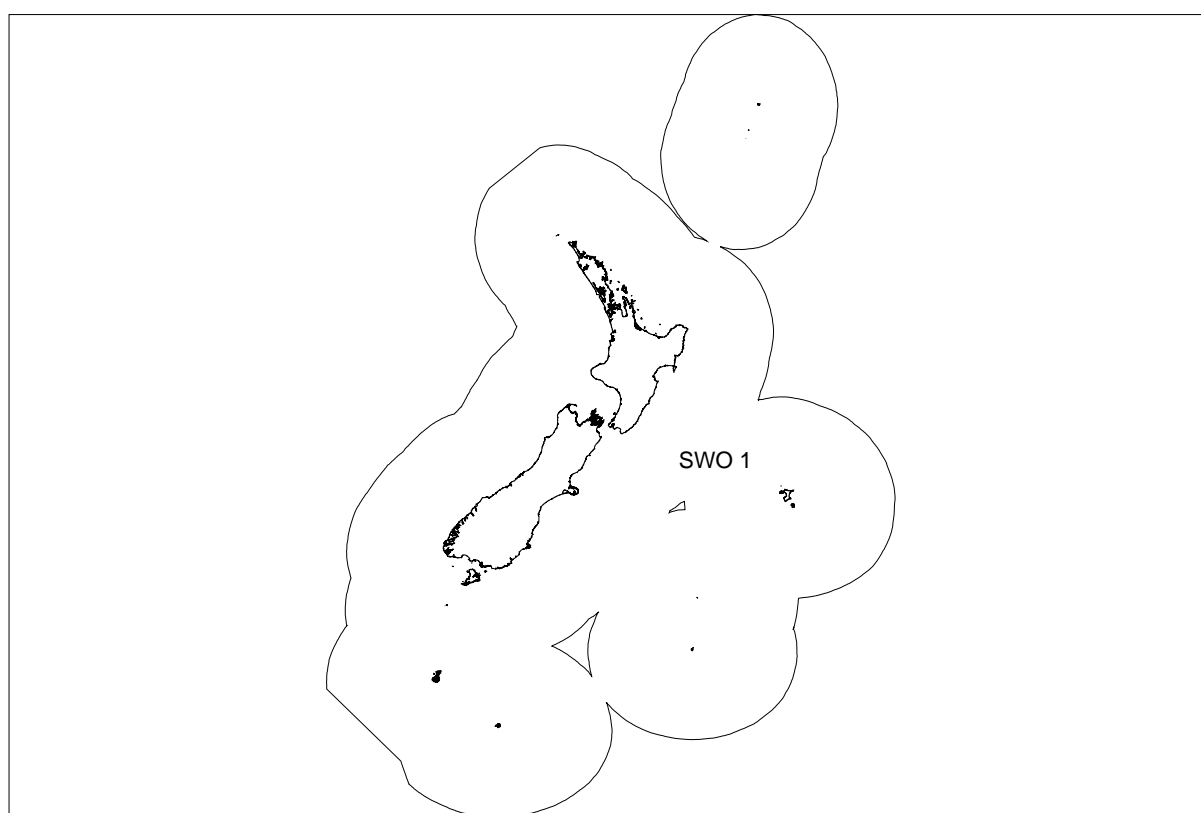
- iii) An allowance for other fishing-related mortality of 16 tonnes; and
 - iv) A TACC of 1 626 tonnes.
- e) **Agree** to set a TAC of 3 753 tonnes for SPD5 and within that TAC set:
 - i) A customary allowance of 8 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance for other fishing-related mortality of 37 tonnes; and
 - iv) A TACC of 3 700 tonnes.
- f) **Agree** to set a TAC of 1 983 tonnes for SPD7 and within that TAC set:
 - i) A customary allowance of 31 tonnes;
 - ii) A recreational allowance of 31 tonnes;
 - iii) An allowance for other fishing-related mortality of 19 tonnes; and
 - iv) A TACC of 1 902 tonnes.
- g) **Agree** to set a TAC of 392 tonnes for SPD8 and within that TAC set:
 - i) A customary allowance of 41 tonnes;
 - ii) A recreational allowance of 41 tonnes;
 - iii) An allowance for other fishing-related mortality of 3 tonnes; and
 - iv) A TACC of 307 tonnes.
- h) **Agree** to set a TAC of 2 tonnes for SPD10 and within that TAC set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 0 tonnes.
- i) **Agree** to amend the Sixth Schedule of the 1996 Act to include spiny dogfish as a species with provision for return-to-sea dead or live.
- j) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns for spiny dogfish.
- k) **Agree** to set deemed values for spiny dogfish at \$0.05/kg.
- l) **Note** that a carry forward of 10 % of ACE is proposed for spiny dogfish.

SWORDFISH (SWO) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Swordfish (*Xiphias gladius*) has been gazetted for QMS introduction on 1 October 2004. The Quota Management Area (QMA) for swordfish is outlined in Figure 1. The fishing year for swordfish will be from 1 October through to 30 September in the following year, and total allowable commercial catches (TACCs) and annual catch entitlements (ACE) are to be expressed in kilograms greenweight.

Figure 1: Quota Management Areas for swordfish



Key Issues to be considered

- 2 MFish considers the key issues that relate to the decisions for setting sustainability measures for the swordfish stock are as follows:
 - a) Swordfish is a highly migratory species and swordfish found in New Zealand fisheries waters are probably part of a central western Pacific stock;
 - b) Background information on catch by sector and method is outlined in Annex One. First utilised by foreign fleets, swordfish is now primarily taken as bycatch by the domestic tuna longline fishery. Domestic landings of swordfish have increased rapidly since 1994–95, peaking during 2000-01. Since 2001 landings have progressively declined;

- c) The commercial targeting of swordfish is prohibited in New Zealand waters, but fishers can land and sell any incidental bycatch. Reported landings of swordfish, and catch per unit effort rose dramatically during 1995-1998 suggesting that swordfish is being targeted by some commercial longliners;
- d) There are no estimates of non-commercial take, but swordfish is an occasional and highly prized catch of the recreational big game fishery. Recreational fishers are concerned that any further development of their interests in the fishery might be effected by localised depletion caused by commercial fishing;
- e) There has been no assessment of swordfish in New Zealand waters. MSY cannot be estimated, as the fish in New Zealand are part of a wide-ranging stock;
- f) Large swordfish are thought to have long residence times in New Zealand fishery waters, which may make them vulnerable to over fishing;
- g) MFish considers that the purpose of the Act will be better achieved by setting a TAC for swordfish under s 14 of the 1996 Act;
- h) Swordfish catches are considered to be sustainable at current levels of utilisation; and
- i) An MFish analysis suggests setting TACCs at current levels of utilisation is unlikely to constrain the target fisheries or result in widespread discarding of swordfish.

List of Management Options

- 3 It is proposed to include swordfish on the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
- 4 MFish proposes one option for setting a TAC, TACC and allowances for the swordfish stock as outlined in Table 1 below.

Table 1 Proposed TACs, TACCs, and allowances for swordfish (tonnes greenweight).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
SWO 1	919	10	20	4	885

- 5 Additional management controls proposed include:
 - a) setting deemed values and the application of differential deemed values; and
 - b) amending reporting regulations.
- 6 Other management options proposed for discussion include:
 - a) returning small swordfish to the water; and
 - b) undertaking a review of voluntary area restrictions sometime in the future.

TACs

TAC management strategy

- 7 It is proposed that swordfish be listed on the Third Schedule to the 1996 Act and a TAC be set pursuant to s 14. This section provides for the setting of alternative TACs for stocks specified in the Third Schedule where the Minister is satisfied that the purpose of the 1996 Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2). One of the criteria for inclusion of stocks on the Third Schedule is where it is not possible, because of the biological characteristics of the species, to estimate maximum sustainable yield (MSY). Swordfish is listed as a highly migratory stock (HMS). Therefore, because of the biological nature of the species, it is not possible to estimate the MSY for the species within New Zealand waters.
- 8 While any TAC must be set in a way that ensures use of the stock is sustainable, there is no requirement to take into account or be guided by the need to manage in accordance with MSY. MFish believes that a TAC set under the provisions of s 14 of the Act can better provide for utilisation (conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters while still ensuring sustainability.
- 9 Another criteria for inclusion on the Third Schedule is that a catch limit has been determined as part of an international agreement. The formation of an effective regional fisheries organisation is yet to be achieved. Nevertheless, countries involved with establishing the Western and Central Pacific Fisheries Commission (WCPFC) have urged states to exercise reasonable restraint in respect of any increase in fishing effort and capacity. International voluntary agreements to manage swordfish within the western and central south Pacific are at least five years into the future. Nevertheless, New Zealand is committed to playing an active role in the WCPFC. New Zealand can further enhance its role in the WCPFC by setting a TAC for swordfish.
- 10 Further, s 14 provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

Rationale for proposed TACs

- 11 There has been no assessment of swordfish in New Zealand waters and unless it can be shown that New Zealand swordfish are largely self recruiting, management of the New Zealand fishery alone will be unable to ensure the sustainability of the fishery. This is because the status of the stock will be, to a large extent, be determined by the size of catches taken outside the EEZ.
- 12 Stock structure, longevity and productivity of the stock are uncertain and little is known of the biology and ecology of swordfish in the New Zealand region. Nevertheless the wide distribution of swordfish, large reproductive capacity and high growth rates amongst juveniles probably contribute to resilience of swordfish stocks to intensive harvesting, at least in the short to medium term.

- 13 Nevertheless, swordfish, particularly large swordfish have at best moderate productivity and may have long residence times which may make them vulnerable to over fishing.
- 14 MFish notes that estimates of yield are available for the wider Pacific stock (refer to paragraph 102 in Annex Two). Landings of swordfish Pacific wide are currently greater than estimates of MSY, however both the accuracy of reported landings and the estimates of MSY are very uncertain. Nevertheless, setting a TAC at current levels of utilisation of swordfish would clearly signal New Zealand's willingness to actively manage highly migratory species and meet its international obligations with regard to the exercise of reasonable restraint.
- 15 Within New Zealand waters, swordfish is principally a bycatch of the surface longline fishery and in general landings of swordfish reflect the number of hooks placed in the water. The total number of hooks was stable between 1985 and 1995 but increased between 1995 and 2000 with the effort progressively levelling off.
- 16 Policy guidelines suggest that the opportunity for development and the extent of utilisation provided for needs to be assessed on a stock-by-stock basis having regard to risk based on the following factors:
- 17 **Sustainability to the stock**, for swordfish the risk is considered moderate to high. There are sustainability concerns relating to the wider Pacific stock and while catch rates within New Zealand waters appear stable, recently reported landings are declining. New Zealand has international obligations to exercise reasonable restraint in the development of its HMS fisheries.
- 18 **Biology of the stock and potential for local depletion**, while the wide distribution of swordfish, large reproductive capacity and high growth rates amongst juveniles probably contribute to resilience of swordfish stocks, larger swordfish within the New Zealand fishery have at best moderate productivity and may have long residence times making them vulnerable to over fishing.
- 19 **Impacts of fishing on the aquatic environment including bycatch**, for swordfish this is a factor of moderate to low risk. Swordfish is taken in conjunction with other large tuna species including bigeye tuna and southern bluefin tuna and any increase in catch creates some risk that swordfish may be caught over and above the catch limit set for this species. The current swordfish fishery is a bycatch of the bigeye tuna target fishery. Prospective catch limits are proposed for bigeye tuna. However, as noted in Annex Two, at paragraph 92 there is considerable potential for swordfish catch rates to be managed by fishers depending on the adoption of fishing practices. There are also unquantified risks to associated and dependent species associated with the method of tuna longlining.
- 20 **Socio economic and cultural issues**, there is high risk of an interaction between commercial and non-commercial fishing unless this is managed. Both sectors are wishing to expand their interests in the fishery but recreational fishers have expressed concern about the potential impact the current level of commercial catch of swordfish might be having on their fishery. While there are limited direct gear conflicts, spatial conflict exists between the sectors particularly in light of the current assumption that large swordfish may have long residence times, which make them vulnerable to over fishing. This is a highly relevant consideration with respect to any potential for

development of the swordfish fishery and may require inter-sectoral spatial agreements if expansion for any or all sectors in the fishery is to occur.

- 21 On balance, the risks associated with an increase in catch of swordfish are considered to be moderate to high. MFish therefore does not propose at this time to set a prospective TAC for swordfish but rather set a TAC for swordfish based on the best available information of current utilisation.
- 22 In the instance of a commercial fishery that is stable, but variable, guidelines suggest criteria to set catch limits on the basis of either the current commercial catch or on average catches when landings have been stable in excess of three years. Neither criterion is directly applicable to swordfish because landings over the last six years have increased, peaked and have since declined. Nevertheless, the TACC has been calculated using average commercial landings for the period between 2000 and 2003. This period includes the two years of peak catches as well as the more recent year of a reduced level of catch. MFish considers this period provides the best available information on current levels of commercial utilisation of swordfish (the average of these commercial landings is 885 tonnes).
- 23 MFish notes that there is provision for an in season increase in TAC if the abundance of swordfish in any fishing year suggests that more may be taken. Any in season increase is given effect through the creation of ACE pursuant to s 68 of the 1996 Act.
- 24 There is no estimate of the recreational catch of swordfish from recreational harvest surveys. Recreational catches to date have been relatively small (the known recreational catch has averaged seven swordfish per year since 1987–88 with a maximum of 36 fish in 1992–93). Game fishing records and allowing a small nominal amount for unknown catches and for recreational catches other than from game fishing has provided the basis for an estimate of current utilisation (20 tonnes).
- 25 There is no estimate of customary catch and the stock is considered to be of no particular importance to Māori. Therefore, in accordance with guidelines, MFish is proposing that an estimate of customary utilisation be based on half the estimate of recreational utilisation (10 tonnes).
- 26 MFish proposes a TAC for SWO 1 of 919 tonnes based on current utilisation of the fishery.

Allocation of TAC

- 27 The TAC constitutes a composite of the respective stakeholder groups' catch allocations, plus any other fishing-related mortality. When setting any TAC, a TACC must be set, as well as allowances determined for the Māori customary and recreational fishing interests and for any incidental fishing related incidental mortality.
- 28 The 1996 Act sets out a process by which the TAC is to be allocated. However, no explicit statutory mechanism provides guidance as to the apportionment of the TAC between sector groups either in terms of a quantitative measure or prioritisation of allocation.

- 29 There is information available for catch history (current utilisation) but only anecdotal information for utility value. In shared fisheries MFish has a policy preference in favour of the catch history allocation model in the absence of clear information to the contrary. While the utility based model is not discounted altogether its application to swordfish is problematic as there is no current information available to explicitly value swordfish to the recreational sector.

Recreational Allowance

- 30 The Recreational sector has an historical involvement with the swordfish fishery and wishes to retain access to trophy-sized fish. As indicated in Annex Two, there is no estimate of the recreational catch of swordfish from recreational harvest surveys. Known recreational catches to date have been relatively small (records suggest that that proportion of the recreational catch attributed to gamefishing has averaged seven swordfish per year since 1987–88 with a maximum of 36 fish in 1992–93). Based on these records and allowing a small nominal amount for unknown catches and for leisure fishing provides the basis for the proposed recreational allowance.
- 31 The proposed recreational allowance is 20 tonnes (set out in Table 1 above). MFish notes the potential for further recreational development of the swordfish fishery.

Customary Māori Allowance

- 32 Policy guidelines provide several options for setting a customary allowance. Where estimates are not available, but there is known to be customary catch, a nominal allowance may be made. For stocks of importance to customary Māori the allowance may be based on the level of the recreational catch. For species and stocks where there is some catch, but the stock is not considered of importance to customary Māori, then the allowance may be based on half the recreational catch.
- 33 It is possible there has been customary harvest, however, swordfish is not considered to be of importance to customary Māori. MFish considers that customary fishers make less use of swordfish than recreational fishers and proposes to use 50% of the current level of recreational utilisation as the basis for the proposed customary allowance.
- 34 The proposed Customary Māori allowance is 10 tonnes (set out in Table 1 above).

Allowance for other sources of mortality

- 35 The proposed allowance for other sources of incidental fishing related mortality is four tonnes (set out in Table 1 above).
- 36 Swordfish smaller than about 25 kg and badly damaged swordfish have little or no commercial value. It is assumed discards are damaged and unmarketable fish. Commercial discard rates appear to be small (about 0.44% on average) with most (57%) of the discarded swordfish dead upon their return to the sea. Discarding will be illegal once the species enters the QMS. Accordingly, a nominal allowance for incidental mortality of 4 tonnes is proposed for fish that are lost before they are landed on board the vessel.

TACC

- 37 The proposed TACC is 885 tonnes (set out in Table 1 above).
- 38 MFish notes the potential for further commercial development of the swordfish fishery both in terms of a target fishery and associated with increased tuna longlining. However it assesses there are medium to high risks in terms of sustainability and of localised depletion of swordfish of increased fishing for this species. MFish assesses any risk of overcatching swordfish is moderate to low, even though further development of tuna fishing is proposed. This is because, as noted in Annex Two, at paragraph 92, there is considerable potential for swordfish catch rates to be managed by fishers depending on the adoption of appropriate fishing practices.
- 39 MFish notes the uncertainty in this assessment and that research on the stock structure of swordfish is proposed. MFish notes that as new information comes to hand there is provision for the possibility of an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.
- 40 On this basis MFish considers that the TACC be based on the average of the recorded landings of the last three completed fishing years. Accordingly there is one TACC option proposed for SWO 1. Based on the average of the last three years commercial landings from this management area it is proposed that the TACC be set at 885 tonnes.
- 41 MFish assesses there will be limited socio-economic impact associated with adoption of this option because it is based on current commercial utilisation. The proposed TACC has been calculated using average commercial landings for the last three years of fishing. This may understate or overstate current commercial utilisation in terms of the period chosen. MFish notes that commercial landings of swordfish peaked in 2000-01 and has since declined. Accordingly changing the years used to calculate average commercial landings could potentially increase or decrease estimates of current commercial utilisation. Any potential impact from adopting different estimates of current utilisation can be measured as direct opportunity costs. A tonne of swordfish has a value and any reduction in tonnage for the commercial sector as a result of a lower TACC can be measured in terms of a forgone value. MFish considers that any such impacts can best be measured by forgone annual earnings as provided by the port price of swordfish (\$6 460 per tonne).

Other Management Measures

- 42 Specific measures are proposed for providing for inclusion of swordfish on the Third Schedule, as a species for which is not possible to estimate MSY.
- 43 Current fishing practice is for all sectors to release small swordfish. MFish has evaluated introducing an MLS and/or including swordfish on the Sixth Schedule. MFish notes the potential for a matrix of possible combinations of these options.
- 44 Specific measures are proposed for setting deemed values and amending fisheries reporting regulations.
- 45 The issue of reviewing voluntary area restrictions is a matter that could be undertaken in the future.

Inclusion of swordfish on the Third Schedule

- 46 MFish proposes that swordfish be added to the Third Schedule of the 1996 Act to allow the TAC for swordfish to be set pursuant to s 14. Section 14 of the 1996 Act provides for alternative TACs when the Minister is satisfied that the purpose of the 1996 Act is better achieved than otherwise setting a TAC under s 13(2). One of the criteria for inclusion of stocks on the Third Schedule is where it is not possible to estimate MSY, because of the biological characteristics of the species.
- 47 Swordfish is a highly migratory species and those caught in New Zealand waters are probably part of a stock that includes the central south Pacific. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. Species managed under s 14 must be listed on the Third Schedule to the Act by an Order in Council. Details of this proposal are set out in Annex One at the end of this section.

Return swordfish to the water

- 48 Current fishing practice is to release small swordfish because they have little market value and some fishers believe they are optimising yield per recruit by releasing lively small fish in the hope they will be recaptured when larger.
- 49 One way of allowing release of small fish is to implement a minimum legal size (MLS). The rationale for any minimum MLS in the swordfish fishery is to reduce wastage and to optimise yield per recruit. In general, there is more benefit to the fishery by delaying recruitment to the fishery until fish have passed through the most rapid phase of their growth. Swordfish grow rapidly during the first year until they reach about 1 metre in lower jaw to fork length (LJFL).
- 50 MFish notes that the Billfish Memorandum of Understanding of October 1996 imposed a voluntary recreational minimum size no smaller than 90 kilograms or less than 2.4 metres LJFL. From published length / weight / age curves for swordfish a 2.4 metre LJFL fish weighs about 175 kilograms and is about ten years of age (by comparison a 90 kilogram fish is about 1.9 meters LJFL and about six years of age).
- 51 MFish notes that the International Commission for the Conservation of Atlantic Tunas (ICCAT) recommends a minimum size of 1.25m LJFL for commercial fishing within the Atlantic Ocean. Such a fish is estimated to weight about 25 kilograms and be two years of age.
- 52 Swordfish grow most rapidly during their first year of age and probably the greatest benefit in terms of optimising yield per recruit is by protecting swordfish less than 1 metre LJFL. Accordingly, if a MLS were to be implemented, MFish would suggest an MLS of 1 meter LJFL.
- 53 Any benefit to the fishery from an introducing a MLS cannot be quantified with certainty. Age and growth of swordfish is currently uncertain, and no yield per recruit analysis has been undertaken. In addition, MFish assesses from observer data that only about 43% of swordfish are brought to the fishing vessel alive and would survive release to the water after capture by longline. The benefits of imposing an MLS are reduced because longline caught swordfish have a low survival rate. That is, there is little benefit in returning small dead fish to the sea. Any benefit of an MLS from

increased yield per recruit is likely to be offset by increased wastage in the fishery because all undersized fish (of which 57% are likely to be dead) must be returned to the water. Accordingly, if this measure were to be adopted and resulted in changes from current fishing practices, the allowance for fishing related mortality would need to be increased. MFish does not support imposition of an MLS for swordfish because of the potential for wastage in the fishery.

- 54 As an alternative to the implementation of an MLS, swordfish could be placed on the Sixth Schedule of the Act to provide fishers' flexibility to control catches of small fish. The Sixth Schedule provides a means for a commercial fisher to return fish to the water subject to stated requirements set out for that stock.
- 55 In general, most stocks subject to the QMS are required to be retained by commercial fishers, and are therefore not listed on the Sixth Schedule. The requirement to retain fish taken provides an incentive for commercial fishers to ensure that their fishing activities are in line with the harvesting rights held, and reduces the potential for high grading of the catch. Therefore, ensuring compliance with the Sixth Schedule provisions in order to prevent discarding of dead swordfish is potentially problematic, especially where a high deemed value relative to port price is proposed (as is the case with swordfish).
- 56 As mentioned previously, in the absence of an MLS, introduction of swordfish into the QMS would require that the current fishing practise of releasing any small swordfish that are alive would no longer be legal. However, in circumstances when the fish is less than a certain size and the fish are likely to survive, the Sixth Schedule could provide flexibility to maintain current fishing practises that might be improving yield per recruit.
- 57 MFish considers that there would be benefits to the stock in not landing small swordfish as long as there is a high likelihood of survival. The MFish's initial view is that the proposal to use the Sixth Schedule provides most benefit to the stock.
- 58 MFish proposes introducing swordfish onto the Sixth Schedule of the Act with the following stated requirements for SWO 1:
- a) only fish that are smaller than 1 metre LJFL; and
 - b) are likely to survive and can be returned to the sea as soon as is practicable after being taken.

Deemed values and overfishing thresholds

- 59 A separate section of this document sets out generic information on the setting of interim and annual deemed values.
- 60 The port price for swordfish is \$6.46. Given this high value, the best fit for swordfish would seemingly be the category of high value single species fisheries fishstocks for which the deemed value would be set at 200% of port price. However, as swordfish is primarily a bycatch of the tuna longline fishery, it does not satisfy the second part of this category – that a species is taken with little, if any, bycatch. MFish therefore proposes two options for setting the swordfish deemed value:

- a) Set the deemed value at 200% of the port price, ie, an annual deemed value of \$12.92;
- b) A second option would be to place swordfish in the “All Others” category, ie, apply a 75% factor to the port price of \$6.46, deriving a deemed value of \$4.85.

61 MFish would welcome stakeholder comment on these two options.

62 It is further proposed that differential deemed values apply. MFish does not propose to set an overfishing threshold for swordfish unless monitoring of catch against the TACC suggests that this is required in the future.

Consequential amendments to regulation

63 As a consequence of the introduction of swordfish into the QMS, MFish proposes to introduce a number of amendments to the reporting regulations to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a generic section of this document.

Area restrictions

64 In the past domestic commercial tuna longline fishers agreed to avoid fishing certain areas to reduce conflict over recreational access to swordfish. However, since 1993 the commercial domestic fleet has grown much larger and no longer observes these area agreements.

65 The New Zealand Big Game Fishing Club have suggested revised areas of spatial separation of sectors fishing for swordfish (refer Annex Two). MFish considers that, while the potential for local depletion is a matter that is relevant to allocation between fishing sectors, the detail of spatial allocation to address local depletion is a matter for resolution between the sectors. Current legislation requires dispute procedures to be followed before regulatory measures can be considered to provide for spatial separation between fishing sectors. Accordingly no area restrictions are currently proposed.

Statutory Considerations

66 In evaluating the management options the following statutory considerations have been taken into account:

- a) The management options seek to ensure sustainability of the stock by setting a TAC and other appropriate measures. Utilisation is provided by way of setting allowances for commercial, recreational and customary fishers. The proposed TAC for swordfish is set on the basis of current utilisation;
- b) Setting a TAC for swordfish clearly signals New Zealand’s willingness to actively manage highly migratory species and meet its international obligations with regard to the exercise of reasonable restraint. MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5) are adequately addressed in the management options for swordfish;

- c) The current fishery for swordfish is primarily a bycatch fishery. It is likely that within a QMS management regime swordfish will become a target fishery. Nevertheless, quota for swordfish is likely to be retained to cover the bycatch of fishing for bigeye tuna and become more part of a tuna longline mix of species;
- d) A wide range of fish species are taken as bycatch of tuna longline fishing. Catch levels vary but many of these species are only rarely taken. The main fish bycatch species associated with the surface longline fishery within the EEZ are to be introduced into the QMS. The QMS will provide the mechanisms for sustainability actions as required;
- e) There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of swordfish into the QMS will improve our ability to address these issues by requiring the incorporation of new information as it comes to hand in the process of determining catch limits for the fishery;
- f) Surface longline fishing is a fishery with known seabird interactions. MFish and the Department of Conservation are currently evaluating submissions on a draft National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries. This draft plan sets out a strategy to reduce the incidental catch of seabirds;
- g) Existing controls that apply to swordfish are outlined in Annex Two. Recruitment of swordfish is not known to be variable at the current levels of stock biomass;
- h) Before setting any sustainability measure the Minister must have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, and any management strategy or management plan under the Conservation Act 1987 that applies to the coastal marine area and is considered to be relevant by the Minister. MFish is not aware of any provisions in any strategy or planning document under the Resource Management Act or Conservation Act that are relevant to the setting of sustainability measures for swordfish;
- i) MFish notes that the setting of a sustainability measure (ie, a TAC) for swordfish is consistent with s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000. The Minister is required to have regard to these provisions. This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf;
- j) Before setting any sustainability measure the Minister must also take into account any conservation services or fisheries services, any relevant fisheries plan approved under the Act, and any decisions not to require conservation services or fisheries services. There is no relevant fishery plan approved that would have any bearing on the setting of TACs for swordfish, and similarly no decision has been made not to require conservation services or fisheries services relevant to swordfish;

- k) The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. No existing mātaimai is likely to effect commercial fishing for swordfish given the offshore nature of the surface long line fishery. Similarly no area closed for customary fishing is known to affect commercial fishing for swordfish. Voluntary restrictions agreed to under the Billfish Moratorium on commercial fishing within SWO 1 to protect recreational interests are no longer observed;
- l) The information used to develop proposals for swordfish relies on biological information and life history parameters derived for swordfish overseas. There is uncertainty in asserting these are applicable to swordfish in New Zealand waters; and
- m) The level of the non-commercial catch for swordfish within New Zealand fisheries waters is uncertain with regard to setting allowances for recreational and customary Māori use. MFish notes however that uncertainty in information is not a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act.

Preliminary Recommendations

67 MFish recommends that the Minister:

- a) **Agrees** to achieve the purpose of the 1996 Act by setting a TAC otherwise than in accordance with s 13(2) by setting a TAC of 919 tonnes for SWO 1 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 20 tonnes;
 - iii) An allowance for other fishing-related mortality of 4 tonnes; and
 - iv) A TACC of 885 tonnes.
- b) **Agrees** to set a deemed value for swordfish of either:
 - i) \$12.92 per kg or
 - ii) \$4.85 per kg.
- c) **Agrees** that differential deemed values apply.
- d) **Agrees** to listing swordfish on the Third schedule and set a TAC pursuant to s 14 of the 1996 Act.
- e) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.
- f) **Agrees** to introduce swordfish onto the Sixth Schedule of the Act with the following stated requirements for SWO 1.
 - i) only fish that are smaller than 1 metre LJFL; and
 - ii) are likely to survive and can be returned to the sea as soon as is practicable after being taken.

ANNEX ONE

Amendment to regulations

Sixth Schedule: return of swordfish to the water

Background

- 68 Current fishing practice is to release small swordfish because they have little market value and some fishers believe they are optimising yield per recruit by releasing lively small fish in the hope they will be recaptured when larger.

Problem definition

- 69 The introduction of swordfish to the QMS will change the management rules for this fishery. As a quota species any swordfish that is caught must be retained and landed. The current practice to release small lively fish will no longer be possible.

Proposal

- 70 The Sixth Schedule provides a means for a commercial fisher to return fish to the water subject to stated requirements set out for that stock. The conditions proposed are that the swordfish be smaller than 1 metre LJFL, and that the fish returned are likely to survive.

Options

- 71 The alternative option is to rely on the incentives within the QMS to ensure that catch and ACE are matched on an annual basis or imposition of an MLS.

Costs and benefits of the proposal

- 72 There are benefits that swordfish of lower size and value can be released if alive and the value of the catch optimised. The measure provides flexibility to maintain current fishing practises that might be improving yield per recruit. There is theoretically no increased wastage of fish associated with adoption of this option in contrast to implementing an MLS.
- 73 There is some risk that fishers will not comply with the requirement that only live fish are returned. This risk (high grading or discarding) is the same whether Sixth Schedule provisions are available or not, particularly given the significant variation in value associated with swordfish condition and to a degree size.

Administrative implications

- 74 There are no specific administrative implications associated with this proposal other than those associated with its implementation.

ANNEX TWO

Species Information

Species Biology

- 75 Swordfish (*Xiphias gladius*) is a surface and midwater (primarily midwater) dwelling, highly migratory species found in all tropical and temperate oceans and large seas. Genetic studies suggest that swordfish in the Pacific Ocean comprise several semi-independent stocks: a western stock, a northeastern stock, a southeastern stock and a central south stock that includes New Zealand waters.
- 76 Swordfish do not form schools or dense aggregations. They move with prevailing currents and are associated with convergence zones, strong thermoclines or underwater features such as seamounts and shelving banks. Male and female swordfish have different geographical and seasonal distributions depending on size. In New Zealand waters there is progressive increasing of the average size of swordfish for increasing latitude beginning at latitude 40 degrees south.
- 77 Adult swordfish are visual predators. Relying on their highly developed eyes to detect prey in water where light is poor. They use their rostrum (sword) to stun prey. They are diurnal feeders, spending daylight hours near the seafloor feeding on demersal fish, they move to the sea surface at night to feed on squid and pelagic fish.
- 78 Within Pacific waters, spawning takes place in tropical waters of the western Pacific Ocean and to a lesser extent the equatorial waters of the central Pacific Ocean. Swordfish are batch spawners, perhaps as frequently as every few days over several months. Eggs are spawned in the upper layers of the ocean and like the protracted larval phase are pelagic. Swordfish have a large reproductive capacity with egg production estimated to range from 1 to 29 million (68–272 kg females respectively).
- 79 Estimates of growth rate indicate very rapid growth during the first year to between 0.9-1 metre in lower jaw to fork length (LJFL) and ten to 15 kilograms of weight, with growth rate progressively slowing with age. The differences in growth parameters between males and females are significant with females growing faster than males. Asymptotic length for males is 2.13 metres while asymptotic length for females is about 3.00 metres LJFL. The maximum size reported for a swordfish is 4.45 metres total length (includes the bill and furthest extension of the tail) and about 540 kilograms (Nakamura 1985). Swordfish reach sexual maturity at five to six years of age. Ward and Elscot (2000) report that Australian swordfish are moderately long-lived but apparently not beyond 25 years of age.

Fisheries Characteristics

Commercial catch

- 80 Two types of swordfish fisheries have been characterised:
- a) Convergence fisheries; and

b) Topographic fisheries.

- 81 The swordfish fisheries of the North Pacific, the South Pacific off Chile and the South Atlantic are convergence fisheries. These fisheries are broadly distributed and associated with currents and fronts in the open ocean. In general, convergence fisheries are highly productive although productivity can be variable depending on local environmental conditions, such as the southern oscillation in Pacific waters.
- 82 Examples of topographic swordfish fisheries include Florida, Hawaii and Australia. Fishing occurs on particular features such as continental slopes, banks and seamounts. As they develop topographic fisheries are characterised by the fleet progressively expanding to new grounds. Initially these new grounds have high catch rates but local depletion can occur when swordfish are removed at a greater rate than that at which growth and immigration can replace them. It is not known for how long individual swordfish “reside” around underwater features. However, mixing throughout swordfish populations probably takes months if not years.
- 83 New Zealand has many of the characteristics of a topographic type swordfish fishery. The North Island blocks the eastwards extension of the South Pacific’s western boundary current. Consequently, the subtropical convergence zone is not as productive as elsewhere in the Pacific. In addition, as discussed further in paragraph 89, the New Zealand fishery has had to expand in area to increase swordfish catches.
- 84 The commercial landings of swordfish are presented in Table 2.

Table 2: Reported landings (tonnes greenweight) of swordfish by FMA for fishing years 1979-80 to 2002-03

Fish Yr	Foreign licensed vessels (Japan and Korea)											Total
	FMA1	FMA2	FMA3	FMA4	FMA5	FMA6	FMA7	FMA8	FMA9	FMA10	?	
1979/80	51.4	306.1	1.9	1.6	0.4				23.4	1.1	9.7	386
1980/81	45.3	311.7	0.9	1.8					384.6	18.1	5.9	762
1981/82	124.7	357.4	0.5	1.0				0.2	239.4	12.2	2.7	738
1982/83	50.3	184.3		0.8					188.7	12.9	4.2	436
1983/84	73.0	163.9	0.1	0.4					142.7	9.2	2.0	389
1984/85	76.3	117.5	1.2	0.3	0.1				104.7	6.9	4.9	320
1985/86	51.8	235.5	0.1						373.6	17.1	7.9	679
1986/87	43.8	231.8		1.4					273.0	24.3	29.0	578
1987/88	15.9	258.8		1.3					3.9	10.1	0.7	290
1988/89	1.0	175.8	0.8	0.6					0.5	2.1		182
1989/90	0.3	172.2	0.3	1.5						16.6	2.1	194
1990/91	0.1	192.5	1.3	0.4			3.6			9.3	12.5	212
1991/92	2.4	172.1					6.5			0.6		195
1992/93		31.1										31
NZ Domestic & Charter fleets												
1991/92	11.0	16.6				3.7			0.7	1.2	0.3	277
1992/93	27.3	12.2		0.1		5.4			1.7	0.1		110
1993/94	51.6	18.8	0.1			1.9			6.9	8.8	0.1	102
1994/95	54.6	22.1		0.1		10.5	0.1	0.1	1.9	1.7	0.4	102
1995/96	69.0	64.6				5.9			5.8	2.3	1	187
1996/97	98.4	85.7		1.8		5.3	0.1	0.1	30.8		1.2	283
1997/98	162.0	106.1		0.9		6.1	1.2	1.2	99	0.1	4.3	534
1998/99	253.7	208.8		19.7		24.8	12.4	12.4	139.5	15.7	4.5	939
1999/00	220.1	355.3	0.1	4.8		29.2	3.3	3.3	147.9	14.9	2.4	925
2000/01	273.7	399.0	0.2	22.7		12.2	3.2	3.2	152.9	37	0.5	1014
2001/02												972
2002/03												669

85 Before the start of any domestic fishery, distant water longline fleets were granted foreign license access to fish for southern bluefin and bigeye tuna (Japan) and albacore (Korea). The swordfish bycatch by the Japanese foreign licensed fishery averaged 388 tonnes per year between 1979-80 and 1992-93 with peak landings of 761 tonnes in 1980-81 and 681 tonnes in 1985-86. The Korean foreign licensed fishery reported only small catches of swordfish (0 to 7 tonnes per year). Most of the Japanese swordfish catch (85%) was from FMA 2 and FMA 9 while the Korean swordfish catch was mostly (79%) from FMA 9 and FMA 10.

86 Declining catches of striped marlin in the early 1980s led to the implementation of the “Billfish Moratorium in Northern Waters” in 1987. These regulations prohibited domestic commercial fishers from taking any billfish. In addition, fishing by foreign licensed tuna longline vessels was prohibited in the waters of the Auckland Fisheries Management Area (FMAs 1 and 9). As part of the regulatory provisions any billfish taken as bycatch could be tagged and released. The terms of the moratorium on billfish for domestic fishers were varied in 1993. The prohibition on taking swordfish in FMAs 1 and 9 was removed and the prohibition on taking marlin species was extended to include all NZ fisheries waters. At that time domestic commercial fishers

agreed to avoid fishing certain areas to reduce conflict over recreational access to swordfish. However, since 1993 the commercial domestic fleet has grown much larger and no longer observes these area agreements.

- 87 In general, landings of swordfish reflect the number of hooks placed in the water for these species. The total number of hooks was stable between 1985 and 1995 but increased between 1995 and 2000 with the effort progressively levelling off. Landings of swordfish by domestic vessels have increased rapidly since 1994–95 peaking in landings of 1 014 tonnes in 2000-01. Since, landings have progressively declined to 669 tonnes during 2002-03.

Catch by region

- 88 Swordfish can be caught in most FMAs although most catches are from waters north of latitude 40° S. Most domestic landings (86%) are reported from FMA 1, FMA 2 and FMA 9.
- 89 Pelagic and Tuna stakeholders group undertook analysis of the distribution of broadbill swordfish catch during 1989 and 2001. From 1989-2001 most swordfish was taken along the edge of the continental shelf off the east coast of the North Island. Highest catches were reported off East Coast, Gisborne, in the Bay of Plenty, and the Poor Knights shelf. Since 1995-96 the development of the domestic tuna fishery resulted in a level of catch and an extension of the geographic range where swordfish has been caught. In the subsequent years, the fishery expanded northwards and down the central east coast of the North Island. The fishery also expanded to the northern west coast of the North Island.

Targeted catch and bycatch

- 90 In New Zealand waters, swordfish are primarily caught in the tuna longline fishery as a bycatch when targeting bigeye, southern bluefin tuna and to lesser extent albacore. For the domestic fleet 75% of hooks are reported as targeting bigeye, 16% as southern bluefin tuna, 7% as albacore and the remaining 2% other tunas.

Table 3: Estimated catches (tonnes greenweight) of swordfish reported by target species for fishing years 1994-95 to 2002-03

Target species	Fishing year ^a								
	1995	1996	1997	1998	1999	2000	2001	2002	2003
Bigeye	40	63	82	196	371	423	518	418	266
Southern bluefin	10	16	41	62	93	105	116	132	130
Albacore	2	7	9	46	54	74	40	63	57

^aFishing year '1995' is fishing year 1994–95

- 91 Swordfish have occasionally been observed as a bycatch of the skipjack tuna purse seine fishery (Habib et al. 1982) and in trawl fisheries for jack mackerel (Anderson et al. 2000) and hoki (Clark et al. 2000).
- 92 It is known that swordfish catch rates can be increased by choice of longline gear, longline setting strategy such as setting at night and the using of lightsticks, hence

there is considerable potential for swordfish catches to increase or decrease depending on the adoption of fishing practices¹.

- 93 Based on MFish observer data, discard rates are about 0.4% of the reported landings with most (57%) of the discarded swordfish dead upon their return to the sea.

Number of domestic vessels catching and landing

- 94 The number of domestic vessels reporting landings of swordfish by year is shown in Table 4.

Table 4: Number of vessel reporting landings of swordfish for fishing years 1996-97 to 2002-03

	Fishing Year						
	1997	1998	1999	2000	2001	2002	2003
Vessels	48	57	77	122	122	152	128

^aFishing year '1997' is fishing year 1996–97

- 95 The numbers of vessels that catch and report landing swordfish reflect the development of an important surface longline fishery for bigeye and southern bluefin tuna since 1996-97. There is a relatively large number of vessels reporting landings of swordfish, consistent with the largely bycatch nature of the fishery. The number of vessels reporting swordfish landings decreased in 2002-03 since peaking in 2001-02. This is associated with the decline in catch for that year.

Recreational and customary catch

- 96 The recreational fishery for billfish pre-dates the development of a commercial fishery for large pelagic species by many years. This recreational fishery is dominated by striped marlin but there has always been a considerable recreational interest in swordfish.
- 97 Angling for swordfish involves floating baits near the surface while drifting at night further from the coast that is routinely fished by recreational vessels. Recreational swordfish fishing can therefore be an uncomfortable experience in exposed oceanic waters with the additional dangers of navigating at night. Accordingly, recreational catches to date have been relatively small (if most of the recreational catch is attributed to gamefishing, the recreational catch has averaged seven swordfish per year since 1987–88 with a maximum of 36 fish in 1992–93). Nevertheless, the recreational sector's interests and aspirations are similar to those of commercial fishers in that it sees potential for a recreational swordfish fishery to expand.
- 98 Recreational fishers place considerable value on the retention of trophy-sized swordfish within areas that are of particular interest to them. Recreational fishers have expressed concern about the potential impact the current level of commercial catch of swordfish might be having on their fishery. While there are limited direct gear conflicts, spatial conflict exists between the sectors particularly in light of the current assumption that as in Australian waters large New Zealand swordfish may

¹ Factors affecting swordfish (*Xiphias gladius*) catch rate in the New Zealand tuna longline fishery Murray and Griggs.

have long residence times (in preferred habitats within the EEZ), which make them vulnerable to over fishing².

- 99 MFish is not aware of any current customary Māori fishery for swordfish, however it is known that swordfish have been harvested in the past.

Regulatory framework

- 100 From 1991 swordfish became subject to regulations that restricted catch to bycatch only, except for those existing target fishers who had received a fishing permit in previous years. This meant swordfish could be legally landed only as bycatch of target fishing for another species.
- 101 No specific regulatory measures apply to the swordfish fishery with the exception that regulations apply to the operation of foreign owned vessels registered to fish within New Zealand fisheries waters. These regulations include a provision excluding the use of foreign owned tuna longline vessels in the Auckland Fisheries Management Area from 1 October to 31 May in the following year.

Fisheries Assessment

- 102 In the Pacific other fleets catch swordfish and the Japanese in particular have a long history of longlining for swordfish and other tunas. During the 1980s, two studies assessed Pacific swordfish stocks by applying equilibrium production models to Japanese data. These studies provided similar results by suggesting a MSY for Pacific swordfish to be about 20 000 tonnes per year (range 18 000-28 000 tonnes). These assessments suggest that the Pacific stock was under exploited until the early 1980s. More recent assessments have been inconclusive and the condition of the Pacific stock remains uncertain.
- 103 Stock structure, longevity and productivity of the central south stock are uncertain and little is known of the biology and ecology of swordfish in this area. However, it is often assumed that swordfish, particularly large swordfish, may have long residence times which may make them vulnerable to over fishing.
- 104 Since 1998, swordfish landings in New Zealand have been stable and for the most recent two years decreasing. However, there is no evidence of declines in catch per unit of effort or in the average swordfish size taken within New Zealand fisheries waters that suggests that swordfish abundance is in decline or that stock status is changing. (This conclusion is based on analysis of catches up to 2001-02. Catch rates since the fishery peaked in 2001-02 have yet to be analysed). There is some anecdotal information from recreational and commercial fishers that swordfish are not as abundant in some areas as they once were.

Associated Fisheries

- 105 The catch composition of surface long lining suggests distinct associations between swordfish and a set of pelagic species. The main species associated with long lining include: bigeye tuna, blue shark, albacore tuna, Ray's bream, southern bluefin tuna, porbeagle/mako shark, dealfish, moonfish, oilfish, and deepwater dogfish.

² Swordfish – environmental - fishery interactions off eastern Australia Campbell and Hobday, 2003

- 106 Sharks and marine mammals such as sperm whales, false killer whales and killer whales are known to predate swordfish. Sharks, particularly mako and blue shark, attacking swordfish hooked on longlines are a source of wastage in the fishery.
- 107 As mentioned, swordfish is primarily caught in the tuna longline fishery as a bycatch when targeting bigeye and southern bluefin tuna. Bigeye tuna and southern bluefin are being introduced into the QMS at the same time as swordfish. MFish has considered economic implications of setting TACCs for associated species starting at paragraph 117 below.

Environmental Issues

- 108 Swordfish, as high-level predators, form an important ecological relationship with their prey, and possibly with some marine mammals. The effect on the ecosystem of large-scale removals of a single species is unknown.
- 109 In New Zealand waters swordfish is primarily taken by surface longline. Environmental issues are common to the fishing method rather than specific to fishing for swordfish. Long lining is not considered to have any direct effects on swordfish habitats.
- 110 A wide range of fish species are taken as bycatch of surface longline fishing. Catches of these species vary but many of these are only rarely taken. The main fish bycatch species associated with the New Zealand surface longline fisheries are being considered for introduction into the QMS. This will provide the mechanisms for sustainability actions as required.
- 111 There is also a non-fish bycatch associated with the surface longline fishery. Fishing vessels sometimes capture seabirds that are chasing baited hooks, and the seabirds drown as the lines sink. Seabirds are also caught in trawl and other fisheries, but longliners are considered to be the main threat to several vulnerable albatrosses and other seabird species. The risks of seabird capture vary geographically and by species. An active programme is underway to mitigate and monitor the capture of seabirds in surface longline fisheries.
- 112 MFish has established standard environmental controls on line and trawl target fisheries to mitigate the impact of these fishing methods on seabirds. These include prohibitions on net sonde monitor cables and compulsory reporting of bycatch of protected species. New Zealand surface longline vessels are required to use tori lines of a specified standard. Vessels are using a variety of practices to reduce seabird bycatch including the use of artificial baits and the practice of setting longlines at night.
- 113 MFish and the Department of Conservation are currently evaluating submissions on a draft National Plan of Action (NPOA) for Seabirds that is expected to result in additional measures that will apply to all fishing vessels fishing for swordfish. Surface longlining is identified by the NPOA as having known interactions with seabirds. Therefore, stakeholders will need to develop an effective code of practise for this method by 2004.

Research

- 114 Information on the New Zealand fishery (catch per unit of effort) is routinely contributed to the international status reports for the central southern Pacific swordfish stock. Factors affecting CPUE have been evaluated for the New Zealand longline fishery. Age and growth and the stock structure of New Zealand swordfish are currently being investigated.
- 115 Research on the interrelationships between swordfish and other elements of the aquatic environment has been identified as an area for future consideration, however, this is a complex area of study and it is unlikely to be undertaken in the foreseeable future.
- 116 As mentioned, obtaining reliable estimates of recreational catch for swordfish has proved difficult. Further work to estimate, and to differentiate, recreational catches and landings are required.

Social, Cultural, and Economic Factors

- 117 Swordfish is a medium value species that is an important component of the domestic tuna longline fishery in New Zealand. MFish considers introduction of swordfish into the QMS has economic benefits for commercial fishers by allowing fishers to fish for swordfish in a way that optimises the value of the catch.
- 118 However, there will be short-term impacts arising from introducing swordfish into the QMS associated with the need for individual fishers to acquire quota to reflect their current fishing operations. Swordfish landings in the criteria years for catch history were substantially smaller than they are currently.
- 119 Two other socio economic factors have been considered:
- a) Are there any socio economic implications of the proposed TACC in comparison to recent landings of swordfish; and
 - b) Are there any socio economic implications of setting the proposed TACC for swordfish with respect to anticipated levels of bycatch under proposed TACCs set for its main target species.
- 120 The proposed TACC is based on the average of the most recent years landings and therefore no direct socio-economic impact is predicted.
- 121 The main target species of swordfish are being introduced into the QMS at the same time as swordfish. There could be important implications for fishing for bigeye tuna or southern bluefin tuna if the proposed TACC for swordfish impacts on the ability of fishers to target species in fisheries where swordfish is taken as a bycatch.
- 122 To address this issue, MFish has analysed the level of bycatch recently reported for swordfish in greater detail. As mentioned, there have been changes in fishing practise that has resulted in the proportion of swordfish bycatch increasing in some target fisheries. MFish considers that the bycatch reported over the past six years provides the best point of comparison for comparing TACC options and ascertaining whether fishing for associated species might be affected.

Table 5: Target landings of Bigeye tuna (BIG), southern bluefin tuna (STN) and albacore tuna (ALB) and bycatch landings of swordfish (SWO) with ratios of the landings by weight.

Year	BIG	SWO	RATIO	STN	SWO	RATIO	ALB	SWO	RATIO
1997-98	213	196	0.92	234	62	0.27	286	46	0.16
1998-99	267	371	1.39	286	93	0.32	219	54	0.25
1999-00	370	423	1.14	240	105	0.44	205	74	0.36
2000-01	374	518	1.39	258	116	0.45	181	40	0.22
2001-02	210	418	1.99	336	132	0.39	374	63	0.17
2002-03	135	266	1.96	271	130	0.48	643	57	0.09

- 123 Swordfish bycatch is associated with target fishing for bigeye tuna and southern bluefin tuna. The level of swordfish bycatch reported from each of the bigeye and southern bluefin tuna fisheries and the ratio of bycatch species to target species weights has been increasing over the past six years. The albacore fishery and its associated bycatch of swordfish is more stable. However, MFish does not consider that recent reported commercial swordfish landings necessarily represent a minimum level in terms of a manageable bycatch. It is known that swordfish catch rates can be increased by choice of longline gear, longline setting strategy such as setting at night and the using of lightsticks, hence there is considerable potential for swordfish catches to increase or decrease depending on the adoption of fishing practices. In a largely unrestrained management environment it is to be expected that some fishers have attempted to optimise the level of bycatch of swordfish as suggested by the data in the above table.
- 124 Fishery characteristics (particularly the relationship between swordfish and other target fisheries) indicate that the TACC proposed will provide a manageable level of bycatch without detrimentally affecting the targeting of associated fisheries. In some circumstances changes in fishing practices might be necessary. As discussed, bycatch levels of swordfish can be substantially reduced with a concomitant reduction in the risk of any economic impact associated with constraints on fishing imposed by any of the current proposals.
- 125 Though not a common catch of recreational fishers swordfish is highly prized when caught. Māori probably does not consider swordfish to be a species of particular importance.

SWORDFISH - FINAL ADVICE

Initial proposals

- 1 MFish proposed recommending to the Governor-General the addition of swordfish (*Xiphias gladius*) to the Third Schedule to the Fisheries Act 1996 (the Act) and then setting a total allowable catch (TAC) pursuant to section 14 of the Act.
- 2 There was one option proposed for setting the TAC, recreational and customary allowances and the total allowable commercial catch (TACC) for swordfish as provided in Table 1 below.

Table 1 Proposed TACs, TACCs, and allowances for swordfish (tonnes greenweight) provided in the IPP.

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
SWO 1	919	10	20	4	885

- 3 An annual deemed value of \$12.92 per kg was proposed for swordfish.
- 4 MFish also proposed that differential deemed values apply for swordfish.
- 5 Consequential amendments to the Fisheries (Reporting) Regulations 2001 were proposed in relation to reporting codes.

Submissions

- 6 Submissions were received on the swordfish proposals from the following submitters:
 - **Bay of Islands Charter Fishing Association (BOICFA)**
 - **Don Glass**
 - **New Zealand Big Game Fishing Council (NZBGFC)**
 - **Richard Pollock**
 - **Seafood Industry Council (SeaFIC)**
 - **Sanford Limited (Sanford)**
 - **Te Ohu Kai Moana (TOKM)**
 - **Te Rūnanga o Ōtākou**
 - **Tolaga Bay East Cape Charters (TBECC)**
- 7 The specific submissions on the proposals for swordfish are summarised and addressed under the relevant headings below.

Biological and Fishery Information

Submissions

- 8 **NZBGFC** submit that it shares the view (outlined in the IPP) that swordfish may not be a typically mobile, highly migratory species (discussed in this paper at paragraph 31). Submissions received did not raise any issues concerning the biological or fishery information for swordfish discussed in the IPP (refer paragraphs 75-99).

Environmental Considerations

Submissions

- 9 No submissions were received on the environmental considerations in relation to sustainability proposals for swordfish outlined in the IPP (refer paragraphs 108-113).

TAC management strategy

MFish initial position

- 10 MFish proposed that the purpose of the Act is better achieved by setting a TAC for swordfish otherwise than in accordance with s 13(2) and that a TAC be set pursuant to s 14 of the Act.

Submissions

- 11 Subject to its reservations regarding the entry of highly migratory species (HMS) into the QMS, **TOKM** agrees that no attempt should be made to “manage” the fish found seasonally in New Zealand waters under the provisions of section 13 of the Act. To that extent TOKM agrees with the proposal to include all HMS on the Third Schedule to the Act and set a TAC pursuant to s 14.

MFish response

- 12 MFish notes the submission supporting its initial position.
- 13 MFish confirms its view that the purpose of the Act is better achieved by setting a TAC for swordfish otherwise than in accordance with s 13(2) and that the TAC be set pursuant to s 14 of the Act. A TAC set under the provisions of s 14 of the Act can better provide for utilisation (conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters while still ensuring sustainability. Section 14 also provides the opportunity for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

TAC

MFish initial position

- 14 The MFish initial position was that the TAC for swordfish be based on current utilisation. An initial preference for a TAC of 919 tonnes was proposed (based on a TACC of 885 tonnes and combined allowances of 34 tonnes).

Submissions

- 15 **TOKM and SeaFIC** both accept the TAC of 919 tonnes proposed in the IPP.
- 16 **Sanford** supports the SeaFIC submission.
- 17 **NZBGFC** notes that the TAC is based in part on the average of the last three years commercial landings. For the following reasons NZBGFC believe that this tonnage is too high.
- 18 NZBGFC submits that the Minister of Fisheries (the Minister) must take note of overseas experience, as swordfish is an HMS. Its submission quotes from a recent report from the Australian Bureau of Rural Sciences which states:

“Broadbill swordfish fisheries often show a development pattern of rapid growth, with catches reaching a peak then declining as fishing effort overshoots sustainable levels. The pattern highlights the ability of commercial fisheries to rapidly expand swordfish catches and to create problems with overcapacity. The initial high catch rates probably reflect a fishing down of an accumulated biomass and resident components of the population¹.”

The NZBGFC submits that this is happening in New Zealand because the swordfish catch has peaked and is now starting to decline.

- 19 The NZBGFC notes that the Australian review of world broadbill fisheries concludes:

“An important lesson from this review is the need to put into place a comprehensive suite of mechanisms to control fishing effort before geographical expansion and overcapitalisation commence. However precise limits are extremely difficult to define for developing fisheries...for swordfish fisheries, effective ‘output controls’ (e.g. total allowable catches) need to be combined with ‘input controls’ such as limits on fishing effort.”

The open access surface longline fishery has resulted in over capitalisation and many owners are looking to exit the fishery now that the catch history years have been announced. The QMS alone is not adequate to manage the spatial conflict that has developed on the most accessible seamounts.

¹ Ward, P. and Elscot, S. 2000. Broadbill Swordfish, Status of World Fisheries. Bureau of Rural Services, Canberra.

- 20 Further, NZBGFC notes that New Zealand is a signatory to the Food and Agriculture Organization of the United Nations (FAO) *Code of Conduct for Responsible Fisheries*. The code states that:

“In the case of new or exploratory fisheries, States should adopt as soon as possible cautious conservation and management measures, including, inter alia, catch limits and effort limits. Such measures should remain in force until there are sufficient data to allow assessment of the impact of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment should be implemented. The latter measures should, if appropriate, allow for the gradual development of the fisheries”.

NZBGFC considers that the proposals contained in the IPP are contrary to the code and will sanction the rapid development of the swordfish fishery.

- 21 The NZBGFC notes that there are international obligations for countries to exercise reasonable restraint in the development of HMS. The submission queries how New Zealand can ask other countries to show restraint in the development of their HMS species when it has promoted the unconstrained expansion of tuna fisheries (except southern bluefin) and allowed the illegal expansion of a swordfish target fishery.
- 22 The NZBGFC and Richard Pollock raise the issue that swordfish may not be a typically mobile, highly migratory species. While the residency and movement of swordfish is not well understood, the NZBGFC submits that commercial fishing is likely to be causing local depletion of swordfish. The submission cites a paper² supporting the hypothesis that swordfish may be removed from an area at a greater rate than that which growth and immigration can replace them and also notes a recent Australian paper³ that concluded that if the pattern of declining catch rates of swordfish off eastern Australia continues to be observed in future years, there may be negative consequences to the viability of the longline fishery and possibly for other swordfish populations in this region.
- 23 Further, the submission notes that the north Atlantic fishery is an example of how quickly swordfish populations can be fished down and how hard they can be to rebuild.
- 24 The NZBGFC also notes the scientific commentary that swordfish populations are quite resilient to over-fishing. However, it submits that mature females seem to be particularly susceptible to surface longline gear when fishing new areas and the catch is only maintained by harvesting large numbers of juvenile fish. The submission states it is likely that current catches across the whole southwest Pacific are sustainable if the precautionary approach is adopted. However the NZBGFC submits that this does not mean that issues of local depletion and gear conflict should be ignored.

² Ward, P., Porter, J.M. and Elscot, S. 2000. Broadbill swordfish: status of established fisheries and lessons for developing fisheries. *Fish and Fisheries*, 2000, 1 317-335.

³ Campbell, R. and Hobday, A. 2003. Swordfish – Seamount – Environment – Fishery Interactions off Eastern Australia. Report to the 16th meeting of the Standing Committee on Tuna and Billfish.

- 25 NZBGFC considers that there are adequate mechanisms in the QMS to allow for the expansion of new or developing fisheries. It submits that an adaptive management programme (AMP) could be used to provide for the expansion in new and developing fisheries while making provision for data collection, other users and environmental impacts.
- 26 **Richard Pollock**, a charter boat skipper, submits it to be beyond belief for the IPP to state that current levels of utilisation are considered sustainable given the lack of research.
- 27 **BOICFA** submits extensively on the potential tourist value of the recreational swordfish fishery. BOICFA submits that a restrictive TAC is required to protect its interest in expanding the charter boat fishery. The submission proposes a TAC of 250 tonnes. It considers that this level of fishing will provide a reasonable level of bycatch for the tuna fleet while reducing any incentive for commercial targeting in areas that are the backbone of the fledgling swordfish charter fishing industry.

MFish response

- 28 MFish notes that industry submissions support the initial position to set a TAC of 919 tonnes for swordfish.
- 29 In response to the NZBGFC submission, MFish believes that its proposal for setting the TAC considered all the factors raised by their submission. In particular the IPP noted at paragraph 17 that there are sustainability concerns relating to the wider Pacific stock and that while catch rates within New Zealand waters appear stable recently reported landings are declining. However, MFish considers that there is no current indication from commercial landings that swordfish within New Zealand fisheries waters are over-exploited.
- 30 Research undertaken in 2001 reported no evidence of a trend in swordfish catch per unit effort (CPUE), average size or sex ratio that would suggest a decline in the New Zealand fishery for swordfish. This is in contrast to fisheries overseas where sustainability has been a concern.
- 31 CPUE is yet to be analysed for the more recent years, but MFish notes that while total reported landings of swordfish declined during the 2002-03 fishing year, so did the number of hooks set in the main target fisheries. Area effects may further confound interpretation of recent CPUE. For example reported landings for 2002-03 were maintained in the central East Coast in comparison to the previous year but declined in the Bay of Plenty, east Northland and on the West Coast.
- 32 MFish considers there is a national interest in developing a fishery for swordfish within New Zealand fisheries waters prior to the imposition of any international management controls to be implemented by way of the Western and Central Pacific Fisheries Commission once formed. MFish acknowledges that this needs to be balanced against the interests of the non-commercial sector in this fishery. It is for this reason, in conjunction with the international concern regarding the vulnerability of swordfish to overfishing, that MFish has proposed a catch limit for swordfish at current catch levels and has not proposed an expansion in catch.

- 33 Once swordfish is introduced into the QMS, MFish expects that there will be rationalisation and consolidation in the fishery. Contrary to the NZBGFC submission, MFish believes this will rationalise any over capitalisation and gear conflicts within the present longline fishery.
- 34 MFish agrees with NZBGFC that once swordfish is introduced into the QMS and rights holders have been identified further development of the fishery could be undertaken through the AMP framework, or preferably a stakeholder fisheries plan. Information for informing any future management proposal will become available in the near future.
- 35 Research to ascertain the stock structure and age and growth of swordfish is underway, studies to map three dimensional habitat use and individual fish movements is planned for later this year and a project for undertaking a stock assessment of swordfish is currently being tendered.
- 36 Work to date has not indicated any decline in average size and sex ratio that would suggest that swordfish are currently over fished, however MFish will also continue the current observer based monitoring program to determine future trends in swordfish biological parameters such as length, weight, and sex ratio.
- 37 With regard to the potential for local depletion, the IPP did take note at paragraph 18 that while the wide distribution of swordfish, large reproductive capacity, and high growth rates amongst juveniles probably contribute to resilience of swordfish stocks, larger swordfish within the New Zealand fishery have at best moderate productivity and may have long residence times making them vulnerable to over fishing.
- 38 MFish considers that a TAC of 919 tonnes is sustainable and disagrees with BOICFA on the need for a very conservative TAC to support the development of a recreational charter fishing industry. MFish acknowledges that spatial management arrangements may be required in the future to better provide for the interests of recreational fishers, however separate legislative processes are available for these to be considered.
- 39 Until the anticipated rationalisation of the tuna longline fishery occurs, the full spatial extent of the fishery operating within the QMS regime will remain unknown. There are large areas of New Zealand waters that have not been fished by the current tuna longline fleet. A more extended operation of the fleet may reduce the potential for spatial conflict with non-commercial interests for both target tuna species and for species such as swordfish.
- 40 Spatial management issues are discussed further in the Other Management Measures section of this advice.

Māori customary allowance

MFish initial position

- 41 The IPP proposed a Maori customary allowance of 10 tonnes on the basis of 50% of the current level of recreational utilisation.

Submissions

- 42 **Te Rūnanga o Ōtākou** submit that, pursuant to the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992, the Minister is required to develop policies recognising the use and management practices of takatā whena in the exercise of customary non-commercial fishing rights. Te Rūnanga o Ōtākou propose that a minimum non-commercial allowance of 25% of the TAC be set for all species proposed for introduction into the QMS of which 80% of that amount should be made available for customary Maori fishing. Te Rūnanga o Ōtākou submits that a customary allocation does not require a harvest to be deemed utilised traditionally.
- 43 **Richard Pollock** submits the lack of any evidence of any customary use of swordfish does not support setting the allowance at the level of 50% of the recreational take.

MFish response

- 44 MFish notes the generic view of Te Rūnanga o Ōtākou for the provision of allowances, but concludes that a standard approach to setting allowances in the manner suggested is not appropriate. Rather a case-by-case approach is indicated. This submission is addressed in further detail in the generic section of this advice.
- 45 MFish acknowledges that it does not know the level of customary harvest and that the lack of any submissions from Maori on customary take of swordfish suggests the species is not of customary importance. Nevertheless MFish confirms its view that any customary usage of swordfish is at a level less than recreational fishers and that the 50% level might be the best approximation.

Recreational allowances

MFish initial position

- 46 The IPP, at paragraph 31 proposed a recreational allowance of 20 tonnes (set out in Table 1 above). The proposal was based on game fishing records and a nominal amount for unknown catches and for leisure fishing.

Submissions

- 47 The **NZBGFC** submit that catching a large swordfish is a pinnacle of achievement for billfish fishers worldwide. The NZBGFC concludes that it is largely irrelevant what level of allowance is made for non-commercial fishing if the current level of commercial fishing is continued or expanded as proposed in the IPP at paragraph 37.

MFish response

- 48 MFish acknowledges the potential for further development of a recreational swordfish fishery. MFish does not consider that this is precluded by the current proposals. MFish interprets the NZBGFC concluding comments in relation to the allowance for recreational fishing as indicating a concern that recreational fishers may not be able to catch to this level.
- 49 The MFish views on the sustainability of proposed catch levels are addressed in the TAC section above.

TACC

MFish initial position

- 50 The IPP, at paragraph 37, proposed a TACC of 885 tonnes (set out in Table 1 above). The TACC of 885 tonnes was based on the average of the last three fishing years commercial landings.

Submissions

- 51 The **NZBGFC** cites research indicating that commercial swordfish targeting has been occurring. The NZBGFC submits that it is unacceptable to accept this illegal fishing practice and set the TACC at current catch levels. Furthermore, the NZBGFC contends that the Act does not permit catch to be recognised under the QMS if it is not lawfully taken.
- 52 The NZBGFC submission concedes that it may be difficult to determine what proportion of swordfish landings were taken while targeting by the domestic fleet but asserts illegally caught fish must not be used in setting TACCs or for allocating provisional catch history. NZBGFC submits that a TACC of 466 tonnes is most likely to reflect a true bycatch level for the fishery based on past foreign licensed catches.

MFish response

- 53 The NZBGFC submits that unlawful targeting of swordfish has occurred. This relates to the fact that, while the fishery for tuna has been open access the issue of fishing permits for other species has been precluded by the permit moratorium that has been in place since 1992. No fishing permits that authorise targeting of swordfish are held.
- 54 Allegations of unlawful targeting of swordfish have been widespread however there have been no cases where prosecutions have resulted. Further the process of determining a TAC for swordfish involves determining what a sustainable level of harvest in the fishery might be. MFish has used commercial landings as an indicator of sustainable use and has not considered how these catches have been achieved.
- 55 The legislation referred to by NZBGFC in relation to lawfully taken fish relates to the allocation of provisional catch history and subsequently shares in the fishery (Part IV of the Act). In this case MFish has allocation procedures in place to follow the provisions outlined in legislation. MFish notes that because of the mismatch in catch history years between tuna and bycatch there is likely to be only a small amount of eligible catch history for swordfish and the majority of the TACC will be allocated to the Crown.
- 56 MFish notes the submissions that indicate that research has concluded that it seems likely that swordfish targeting, either intentionally or unintentionally, has been increasing in the domestic longline fishery⁴. However, the report also notes there are operational aspects of long lining that play an important role in maximising not only catch rates of swordfish but of bigeye tuna, the main reported target species. In addition, MFish notes the Australian swordfish target fishery reports greater catch

⁴ Murrey, T. and Griggs, L. Factors effecting swordfish (*Xiphias gladius*) catch rate in the New Zealand tuna longline fishery. Unpublished NIWA report for project SWO 2001/01.

rates than those reported for the New Zealand fishery. This is not indicative of the fact that there is large scale targeting in New Zealand waters.

- 57 MFish considers it would be impossible to ascertain what proportion, if any, of the swordfish catch reported as by-catch was taken by illegal targeting. And that it would not be appropriate to arbitrarily decide what proportion of landings was lawfully taken. MFish reiterates its view that the central issue in determining a TAC and TACC in this case is an assessment of a sustainable level of harvest. This is a separate issue from the determination of allocations based on legislative provisions that relate to the lawfulness of catches.

Allowances for other sources of mortality

- 58 Submissions did not raise any issues associated with the proposal for setting an allowance for other sources of mortality for swordfish. MFish proposes no change to the procedures for estimating other sources of mortality, but notes that as discussed in the IPP at paragraph 53 the estimates themselves vary depending on the management option being considered and are based on several assumptions that require further investigation. Nevertheless, MFish confirms its view that an allowance of four tonnes should be set for other sources of fishing related mortality.

Return of swordfish to the water

MFish initial position

- 59 The IPP at paragraphs 48-57 discussed options for returning swordfish to the water. MFish concluded that there would be benefits to the stock in not landing small swordfish as long as there was a high likelihood of survival. MFish's initial view was that the proposal to use the Sixth Schedule to allow the return of swordfish to the sea in line with conditions provides most benefit to the stock.
- 60 MFish proposed introducing swordfish onto the Sixth Schedule of the Act with the following stated conditions for SWO 1:
- a) only fish that are smaller than 1 metre lower jaw fork length (LJFL) be returned to the sea; and
 - b) only swordfish that are likely to survive and can be returned to the sea as soon as is practicable after being taken are returned.

Submissions

- 61 **TOKM** proposed that swordfish regardless of size be added to the Sixth Schedule.
- 62 **SeaFIC** submit that the provisions of the Sixth Schedule should apply to all HMS.
- 63 **NZBGFC** consider it wrong to assume that the mortality of small swordfish is the same as large swordfish (when arguing against the benefits of a minimum legal size). Its submission states that there is anecdotal evidence that small swordfish are more likely to be alive at the boat. NZBGFC submit that a compulsory minimum legal size (MLS) for swordfish should be set at 1.25 m lower jaw fork length and 25 kg, the

same as set by ICCAT in the North Atlantic. This is because swordfish not only grow rapidly in their first year but they also grow just as rapidly in the second year.

- 64 **TBECC** considers that overseas experience with swordfish has shown the species to be vulnerable to over fishing. It submits the most important management measure for swordfish is implementation of a MLS corresponding to the female size of maturity to ensure that all swordfish have an opportunity to breed.

MFish response

- 65 MFish notes that industry submissions support including swordfish on the Sixth Schedule but this support is for swordfish irrespective of size. Non-commercial submissions support the imposition of an MLS for swordfish which would require the compulsory return of fish below the specified size.
- 66 MFish does not agree with either the NZBGFC proposal for an MLS of 1.25 LJFL or the TBECC proposal of a MLS based on the size of maturity. As discussed in the IPP at paragraph 53, MFish does not support the imposition of an MLS for swordfish because of the potential for wastage associated with the compulsory release of swordfish below a certain size. A proportion of these will be dead on release.
- 67 The TBECC proposal would apply to female fish of about 1.6 m LJFL resulting in particularly high levels of wastage and as swordfish is highly fecund this measure is unlikely to provide any benefits to the stock. In addition, imposition of any MLS offers few incentives for fishers to their modify fishing practices to avoid the capture of small fish as these can be lawfully returned to the sea.
- 68 As a general rule, MFish considers that quota species once caught should be retained unless there are good reasons for an exception. The use of the Sixth Schedule in the case of swordfish has a specific rationale to provide fishers' flexibility to control catches of small fish and to assist in optimising the yield per recruit from the fishery. This latter reason is predicated on the fact that any fish released under the provisions of the Sixth Schedule is likely to survive.
- 69 MFish notes that the NZBGFC proposal for a 1.25 m LJFL MLS is consistent with the International Commission for the Conservation of Atlantic Tuna's (ICCAT) recommendation of a minimum size for commercial fishing within the Atlantic Ocean. In addition, MFish notes that the US Department of Commerce introduced a regulation banning imports of Atlantic swordfish less than 15 kg trunked weight (~20 kg green weight) to help implement the minimum size rule.
- 70 MFish now considers that there is a greater benefit to the stock in not landing swordfish smaller than 1.25 m LJFL rather than the 1.00 m LJFL contained in its original proposal. MFish reiterates its initial view that the proposal to use the Sixth Schedule provides more benefit to the stock than a MLS that would require all fish below this size to be released dead or alive.
- 71 MFish proposes introducing swordfish onto the Sixth Schedule to the Act with the following stated requirements for SWO 1:
- a) Only swordfish that are smaller than 1.25 metre LJFL may be returned to the sea; and

- b) Only swordfish (less than 1.25 m LJFL) that are likely to survive and can be returned to the sea as soon as is practicable after being taken may be returned to the sea.

Other management measures

MFish initial position

- 72 The IPP noted at paragraph 65 that while the potential for local depletion is a matter that is relevant to allocation between fishing sectors, the detail of spatial allocation to address local depletion is a matter for resolution between the sectors. Accordingly, no specific area closures were proposed although it was noted in the IPP at paragraph 45 that the issue of reviewing voluntary area restrictions is a matter that could be undertaken in the future.

Submissions

- 73 The NZBGFC submits that the IPP is deficient in not providing any management action to protect game fishing interests in this fishery. It submits that the IPP proposal to discuss, “*undertaking a review of voluntary area restrictions at some time in the future*” to be woefully inadequate.
- 74 NZBGFC notes that Campbell and Hobday³ have cautioned that, if sequential declines are seen in future years across the more recently fished regions offshore, this would have significant management implications and may raise the need for some form of spatial management. The submission also notes that the United States has introduced time area closures in swordfish hot spots to reduce juvenile swordfish mortality without detecting a major effect on fishing for other target species.

MFish response

- 75 MFish considers that matters of spatial allocation are not matters that can be addressed in the setting of sustainability measures for a stock. Rather the dispute procedures of the Act are available at any stage if recreational fishers consider that their fishing interests are adversely affected by commercial fishing.
- 76 The approved dispute procedure is intended to provide a process for stakeholders to resolve disputes without recourse to regulation. If a dispute remains unresolved the Minister can be asked to resolve that dispute. An important element of the dispute procedure is that if one party to the dispute decides not to participate in the process the Minister can still be asked to make a determination.
- 77 Once swordfish and other tuna longline target and bycatch species are introduced into the QMS, MFish expects that there will be some rationalisation and consolidation in the commercial fishery. The commercial stakeholders (quota owners) will be more readily identifiable and MFish anticipates that the development of stakeholder management arrangements will be facilitated. This will in turn improve the prospects of stakeholder agreed resolution to any concerns regarding spatial conflict that may occur in the fishery.

Deemed value and overfishing thresholds

MFish initial position

- 78 MFish proposed two options for setting deemed values for swordfish (based on the 2002 port price for swordfish). These were to either set the annual deemed value on the basis of a “high value single species fisheries fishstocks” and set the annual deemed value at 200% of port price (\$12.92) or place swordfish in the “all other fishstocks” category and apply a 75% factor to the port price deriving a value of \$4.85.
- 79 In addition, MFish proposed in the IPP that differential deemed values apply and did not propose to set any over fishing threshold for swordfish.

Submissions

- 80 **TOKM and SeaFIC** both submit that swordfish be classed in the ‘all other fishstocks’ category for deemed value purposes and that the annual deemed value be based on 75% of the port price for swordfish. They submit that although the value of swordfish can be high the swordfish is likely to remain as an incidental catch of other target fisheries. TOKM does not accept that high value alone is sufficient justification for including swordfish in the ‘high value single species fisheries fishstocks’.
- 81 **SeaFIC** submit that the “high value” category was intended for species for which there is no reasonable excuse for landing catch without ACE. The per kilogram value should only be a secondary consideration. SeaFIC submit that it is important for MFish to clearly define and follow policies on deemed values because they have important effects on current and future value of quota rights.

MFish response

- 82 MFish considers that the primary objective of the deemed value regime for swordfish should be to ensure the integrity of the TACC set for this species. That is deemed values should be set in a way that encourages fishers not to fish in excess of ACE.
- 83 MFish notes that submissions oppose the use of the ‘high value single species fisheries fishstock’ category for swordfish primarily because of the bycatch nature of the fishery. MFish notes that once swordfish is managed within the QMS there will be no distinction between target and bycatch fisheries. Target fisheries for swordfish exist in other waters (for example in Australia) and it is known that fishing practises can be adjusted to increase or decrease the proportion of swordfish in surface longline catches. MFish considers that swordfish meets the criteria proposed by SeaFIC that there should be no excuse for catching swordfish without ACE.
- 84 However, MFish accepts the SeaFIC comment that the setting of deemed values can influence the value of quota. This is of particular relevance to swordfish in that it is likely that a significant proportion of the TACC will be allocated to the Crown. While MFish is concerned to ensure the integrity of the catch limit for swordfish because of the vulnerability of this species to overfishing MFish considers that a deemed value set at the rate for ‘all other fishstocks’ (75% of port price) in combination with the application of differential deemed values is likely to achieve

this. MFish notes that there is the opportunity for future review and amendment to deemed values if they are not effective in achieving this objective.

- 85 Further, MFish notes that the inclusion on the Sixth Schedule will partially alleviate the need for fishers to land unintended catch of small swordfish and, as noted above it is known that swordfish bycatch rates can be managed depending on the choice of fishing practices.
- 86 MFish confirms its view that no over fishing threshold should apply to swordfish stocks. Rather the effectiveness of the deemed value regime in ensuring that commercial landings remain within the available ACE should be monitored and an over fishing threshold only considered if and when it is apparent that further control is required.
- 87 MFish notes that the proposal to set deemed values was based on 2002 port prices. Port price information for 2003 is now available. In accordance with the use of best available information MFish proposes deemed values be based on the 2003 price. A lower deemed value than that proposed in the IPP for the 'all other fishstocks' option is now recommended (refer Table 2 below).

Table 4: Proposals to set deemed values for swordfish:

Proposal	Survey port price (\$/kg)	Proposed % factor	Proposed Annual Deemed Value (\$/kg)	Proposed Interim Deemed Value	Differential deemed value (Y/N)	Over fishing threshold
IPP	6.46	75	4.85	2.42	Yes	No
FAP	5.66	75	4.25	2.12	Yes	No

Legal Obligations

- 88 The statutory considerations that must be taken into account when setting a TAC and allowances for swordfish were identified in the IPP (refer to paragraph 66(a)-(m)). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Recommendations

- 89 MFish recommends that you:
- a) **Agree** that the purpose of the Act is better achieved by setting a TAC for swordfish otherwise than in accordance with section 13(2) of the Act.
 - b) **Agree** to set a TAC for swordfish pursuant to section 14 of the Act.
 - c) **Agree** to set a TAC for swordfish of 919 tonnes and within this set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 20 tonnes;
 - iii) An allowance for other fishing-related mortality of 4 tonnes; and
 - iv) A TACC of 885 tonnes.

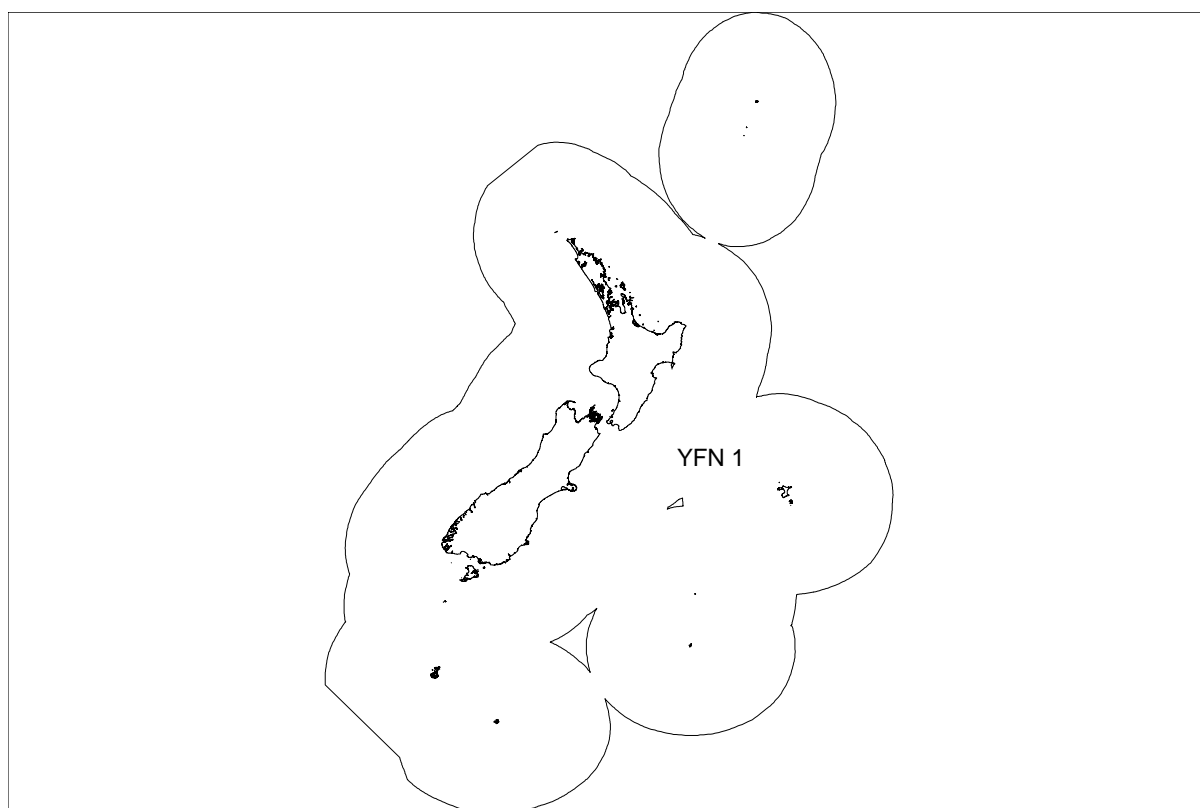
- d) **Agree** to set an annual deemed value for swordfish of \$4.25 per kg.
- e) **Agree** that differential deemed values apply.
- f) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.
- g) **Agree** to introduce swordfish onto the Sixth Schedule with the following stated requirements for SWO 1:
 - i) Only swordfish that are smaller than 1.25 metre LJFL may be returned to the sea; and
 - ii) Only swordfish (less than 1.25 m LJFL) that are likely to survive and can be returned to the sea as soon as is practicable after being taken may be returned to the sea.

YELLOWFIN TUNA (YFN) – INITIAL POSITION PAPER

Introduction into the QMS

- 1 Yellowfin tuna has been gazetted for introduction into the QMS on 1 October 2004. The Quota Management Area for yellowfin tuna, shown in Figure 1, includes all New Zealand fisheries waters (FMAs 1-10). The fishing year for yellowfin tuna will be from 1 October to 30 September in the following year. The total allowable commercial catch (TACC) and annual catch entitlement (ACE) are to be expressed in terms of kilograms greenweight.

Figure 1: Quota Management Area for yellowfin tuna



Key issues to be considered

- 2 Key issues to be considered in relation to decisions on sustainability measures and other management controls for yellowfin tuna are as follows:
 - a) Yellowfin tuna is a highly migratory species and the yellowfin tuna found in New Zealand fisheries waters are part of a Pacific wide stock;
 - b) International assessments suggest that the yellowfin tuna in the equatorial Pacific is approaching an overfished state, in part because of the high proportions of juveniles caught in these waters;
 - c) Yellowfin tuna is taken in New Zealand fisheries waters primarily as a bycatch of tuna longlining for other large tuna species, in particular bigeye tuna;

- d) There is some potential for expansion of the fishery for yellowfin tuna within New Zealand fisheries waters based on the levels of catch historically taken by foreign licensed fleets and the limited fishing to date by the domestic fleet within the Kermadec FMA;
- e) There are no estimates of non-commercial catch for yellowfin tuna;
- f) While yellowfin tuna is known as a prized gamefish species for the recreational sector it is not known as a species of particular significance for customary Māori fishing; and
- g) There is potential for spatial conflict between commercial and non-commercial sectors.

List of management options

- 3 It is proposed to add yellowfin tuna to the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
- 4 The proposed options for a TAC allowances, TACC and other management measures for yellowfin tuna are as follows:

Table 1: Proposed TAC, TACC, and allowances for yellowfin tuna, YFN 1 (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC *
YFN 1	268	15	30	4	219
OR					
YFN 1 #	313	15	30	5	263

* TAC/TACC options based on best annual catch in the most recent five years plus 25% OR plus 50% with the addition of allowances.

MFish preferred option

- 5 It is further proposed to:
 - a) Amend reporting regulations to take account of the decision to set a single QMA for yellowfin tuna;
 - b) Set a deemed value of \$7.92 for yellowfin tuna; and
 - c) Apply differential deemed values.

TACS allowances and TACCs

TAC management strategy

- 6 Section 14 of the 1996 Act provides an exception to setting a TAC based on an assessment of MSY where the Minister is satisfied that the purpose of the Act would be better achieved by setting a TAC otherwise than in accordance with s 13(2). It is not possible to estimate MSY for the part of the yellowfin tuna stock that is found within New Zealand fisheries waters.
- 7 It is proposed that TAC for yellowfin tuna is set pursuant to s 14 of the 1996 Act. While any TAC must be set in a way that ensures use of the stock is sustainable, there

is no requirement under s 14 to take into account or be guided by the need to manage in accordance with MSY. A TAC set under s 14 of the Act must be set in a way that better achieves the purpose of the 1996 Act. MFish believes that a TAC set under the provisions of s 14 of the 1996 Act can better provide for utilisation (developing fisheries to enable people to provide for their social, economic and cultural wellbeing) for stocks whose range extends beyond the bounds of New Zealand fisheries waters while ensuring sustainability.

- 8 Further s 14 provides for an in-season review of the TAC to take advantage of available yield beyond any pre-determined target stock level.

Rationale for proposed TACs

- 9 In the absence of estimates of sustainable catch for yellowfin tuna a TAC is proposed that is based on estimates of current utilisation and an evaluation of the potential for expansion of the fishery. This evaluation provides a basis for assessing the sustainability of proposed catch limits.
- 10 The best annual reported catch of yellowfin tuna in recent years is 175 tonnes. Comment from fishers indicates that catches of yellowfin tuna may have been constrained as fishers spend a proportion of their time within a fishing year competing for southern bluefin tuna. The fishery for southern bluefin tuna is primarily in more southern waters where a bycatch of yellowfin tuna is less likely. The potential of the bigeye target fishery and associated bycatch of yellowfin tuna within New Zealand fisheries waters has not been fully explored. This is particularly the case in the Kermadec FMA where there has been little fishing by domestic vessels.
- 11 International assessments suggest that there are sustainability concerns in relation to fishing for this species in the equatorial Pacific region. New Zealand has an obligation to exercise reasonable restraint in the development of its fisheries arising from resolutions of the Preparatory Conference for the Commission for the Conservation of Highly Migratory Stocks in the Central and Western Pacific. In this context MFish does not consider that it is unreasonable to provide for expansion in the level of the yellowfin tuna fisheries within New Zealand coastal waters. The New Zealand catch of yellowfin tuna is less than 0.05% of the Pacific wide catch (compare 175 tonnes with 300-400 000 tonnes).
- 12 Policy guidelines suggest that the opportunity for development and the extent of utilisation provided for needs to be assessed on a stock-by-stock basis having regard to risk based on the following factors:
- 13 **Sustainability to the stock**, for yellowfin tuna is considered a moderate risk. Sustainability concerns relate to the equatorial Pacific and the New Zealand fishery is a small proportion of the catch for the stock as a whole (less than 0.05%).
- 14 **Biology of the stock and potential for local depletion**, while local depletion is indicated in the equatorial Pacific it is associated with intensive purse seine fishing effort. There is no local depletion apparent in more temperate regions of the Pacific.
- 15 **Impacts of fishing on the aquatic environment including bycatch**, for yellowfin tuna this is a factor of moderate risk. Yellowfin tuna is taken in conjunction with

other large tuna species including southern bluefin tuna and any increase in catch creates some risk that southern bluefin tuna may be caught over and above the catch limit set for this species. The current yellowfin tuna fishery is as a bycatch of the bigeye tuna target fishery. A prospective catch limit is also proposed for bigeye tuna (50% over and above the best recent reported catch) and no mismatch is predicted with the catch limits proposed for yellowfin tuna.

- 16 There are unquantified risks to associated and dependent species associated with the method of tuna longlining which may require future consideration.
- 17 **Socio economic and cultural issues**, with regard to yellowfin tuna there are clear benefits from increased revenue to the fishery if an expansion in catch can be realised and sustained. There are, however, areas of the fishery (the eastern Bay of Plenty is the most prominent example) where there is likely to be an interaction between commercial and non-commercial fishing unless this is managed. This suggests that the risks associated with an expansion in catch are shared with the fishing interests of other sectors. This is a relevant consideration with respect to the potential for further development of the yellowfin fishery and may require inter-sectoral spatial agreements if further expansion in commercial fishing is to occur.
- 18 **Anecdotal information on abundance and size of likely habitat in the management area**, the Kermadec FMA is an area that has only be lightly fished for yellowfin tuna by domestic fishers. Anecdote and historical foreign licensed catch suggest this area provides expansion potential for the fishery.
- 19 On balance the risks associated with an increase in catch of yellowfin tuna are considered to be low to moderate and within manageable bounds. MFish therefore proposes to set a prospective TAC for yellowfin tuna. Two options (based on arbitrary increases over and above the best recent years reported catch) are proposed:
 - Option One: 265 tonnes
 - Option Two: 313 tonnes
- 20 The choice of options is dependent on the level of risk associated with the development of the fishery. MFish has not proposed options higher than a 50% increase on the best years catch until more is known about the distribution of yellowfin tuna in New Zealand fisheries waters and the potential interactions with other target and non-target species. However, MFish considers that the risks associated with the higher of the TAC options proposed are manageable and provide more opportunity for the development of what is considered to be an under-utilised fishery. The MFish initial preference is for a TAC of 313 tonnes.
- 21 MFish notes that there is provision under s 14 for an in season increase in TAC if the abundance of yellowfin tuna in any fishing year suggests that more may be taken. Any in season increase is given effect through the creation of ACE pursuant to s 68 of the 1996 Act.
- 22 Further, the annual TAC and TACC are subject to review based on the performance of the fishery. If the TAC proves to be limiting the development of the fishery (eg, it is consistently fully caught) then there is an annual opportunity to consider proposals for a TAC increase.

Proposed allowances and TACC

Customary Māori and recreational allowances

- 23 There are no estimates of non-commercial catch of yellowfin tuna available. The surface schooling behaviour of this species makes yellowfin tuna the most accessible of the large tuna species to the non-commercial sector.
- 24 The availability of yellowfin to the recreational sector varies widely from year to year¹. In some years yellowfin is taken in significant numbers by the recreational sector in areas such as the eastern Bay of Plenty. An allowance of 30 tonnes for recreational fishing is therefore proposed.
- 25 Policy guidelines suggest that, in the absence of estimates of customary catch, an allowance for customary harvest based on a proportion of the recreational allowance should be made. Yellowfin tuna is known as a customary catch but is not known as a species of particular significance to Māori. An allowance for customary Māori fishing of 15 tonnes (50% of the recreational allowance) is therefore proposed.

Allowances for other sources of mortality

- 26 Observer information on the level of discarding and loss of yellowfin tuna is available from the 1990s. A loss of 0.1% and discarding of 10.1% of the catch were estimated for yellowfin tuna. A proportion of the fish were discarded as a result of damage (18%) but the primary reason for discarding was small size. In the absence of specific estimates for yellowfin tuna an allowance of 2% of the TACC is proposed for other sources of mortality for fish that are lost before landing on board the vessel.

TACCs

- 27 TACCs are proposed based on current utilisation increased to provide for development opportunity in the fishery. Options are an increase of 25% over and above the best annual reported commercial landings over the most recent five years (175 tonnes) or an increase of 50% over and above the best annual reported commercial landings.
- Option One: 219 tonnes
 - Option Two: 263 tonnes
- 28 MFish assess that the level of risk associated with the higher TAC option proposed is manageable and the adoption of this option and associated TACC (263 tonnes) is the MFish preferred initial position because it provides more opportunity for utilisation within an acceptable level of risk to sustainability of catches within New Zealand fisheries waters.

¹ Holdsworth J and Saul P. 2003. New Zealand billfish and gamefish tagging 2001-02. New Zealand Fisheries Assessment Report 2003/15

Other management measures

- 29 Other management measures proposed for yellowfin tuna at this time are to include yellowfin tuna on the Third Schedule of the 1996 Act by Order in Council, to make consequential amendment to reporting regulations and to set a deemed value.

Include yellowfin tuna on the Third Schedule

- 30 MFish proposes that yellowfin tuna be added to the Third Schedule of the 1996 Act.
- 31 Yellowfin tuna is a highly migratory species caught in New Zealand waters but part of a stock that includes the entire South Pacific. In this context it is not possible to estimate MSY for that part of the stock that is found within New Zealand fisheries waters. One of the criteria for inclusion of a stock on the Third Schedule is therefore satisfied.
- 32 Section 14 of the Act requires that species managed under s 14 be listed on the Third Schedule of the 1996 Act by Order in Council. Section 14 of the 1996 Act provides for the setting of an alternative TAC if the purpose of the Act is better achieved than by setting a TAC pursuant to s 13(2).

Consequential amendment to regulations

- 33 As a consequence of the introduction of yellowfin tuna into the QMS, MFish proposes to amend the Fisheries (Reporting) Regulations 2001 to ensure the effective and efficient operation of the QMS. Details of the proposed amendments are set out in a separate generic section of this document.

Deemed values and overfishing thresholds

- 34 A separate section of this document sets out generic information on the setting of interim and annual deemed values.
- 35 Despite the high value of yellowfin tuna, MFish considers that the best fit for this species is the category of all other stocks in part because it is taken primarily as a bycatch. The factor of the port price applied to all other species is 75%. The port price for yellowfin tuna is \$10.56. An annual deemed value of \$7.92 is therefore proposed. It is proposed that differential deemed values apply. Catches exceeding 20% of ACE would attract a proportionally higher deemed value.
- 36 MFish does not propose to set an overfishing threshold for yellowfin tuna, unless monitoring of catch against the TACC suggest that this is required in the future.

Statutory considerations

- 37 The management options presented for yellowfin tuna seek to better achieve the purpose of the 1996 Act (s 14) by providing opportunity for further unitisation (development) within what should be a sustainable catch of this species within New Zealand fisheries waters balanced against an obligation to exercise reasonable restraint in the development of the fishery.

- 38 The proposals are considered to be consistent with New Zealand's international obligations in relation to fishing and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5).
- 39 The fishery for yellowfin tuna is as a bycatch of targeting other more abundant tuna species such as bigeye and southern bluefin tuna. A wide range of fish species are taken as bycatch of surface longline fishing. Catch levels vary but many of these species are only rarely taken. The main fish bycatch species associated with the surface longline fishery within New Zealand fisheries waters are to be introduced into the QMS. The QMS will provide the mechanisms for sustainability actions as required.
- 40 There are however a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of yellowfin tuna into the QMS will improve our ability to address these issues by requiring the incorporation of new information as it comes to hand in the process of determining catch limits for the fishery (ss 9(a), (b), and (c)).
- 41 There are known effects of tuna longline fishing on the aquatic environment (seabirds) but steps have been and continue to be taken to mitigate these risks (refer Annex One) (s 8(2)(b)).
- 42 Yellowfin tuna is not known to be a highly variable stock. The availability of yellowfin tuna within parts of New Zealand fisheries waters is known to vary on an annual basis. Other areas such as the Kermadec FMA are thought to contain yellowfin tuna that are semi-resident in the area (s 11(1)(c)).
- 43 Tuna longlining is not known to pose a risk to benthic habitat of particular significance to fisheries management. The pelagic habitat, however, and any associate risks of fishing are poorly understood (s 9(c)).
- 44 Before setting any sustainability measure, the Minister must have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, and any management strategy or management plan under the Conservation Act 1987 that applies to the coastal marine area and is considered to be relevant by the Minister. MFish is not aware of any provisions in any strategy or planning document under the Resource Management Act or Conservation Act that are relevant to the setting of sustainability measures for yellowfin tuna (ss 11(2)(a) and (b)).
- 45 Similarly, before setting any sustainability measure relevant to the Hauraki Gulf (eg, a TAC for the yellowfin tuna), the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000 Act. The Hauraki Gulf is defined in that Act to include all coastal waters and offshore islands from near Te Arai Point offshore to the Moko Hinu Islands, and south to Homunga Point (north of Waihi Beach). This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a

matter of national importance. Yellowfin tuna may occur in parts of the Hauraki Gulf Marine Park. MFish considers that the setting of sustainability measures for yellowfin tuna will better meet the purpose of the Act, and ensure that the range of values associated with the use of the yellowfin tuna resource are enhanced for the people and communities in the area (s 11(2)(c)).

- 46 Before setting any sustainability measure, the Minister must also take into account any conservation services or fisheries services, any relevant fisheries plan approved under the Act, and any decisions not to require conservation services or fisheries services. There are no relevant fisheries plans approved that would have any bearing on the setting of a TAC for yellowfin tuna. Conservation and fisheries services apply to tuna fisheries generally in order to assess and monitor the impacts of fishing on non target fish and non-fish species. There have been no decisions not to require fisheries or conservation services for yellowfin tuna (s 11(2A)).
- 47 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. While mātaimai reserves exist within YFN 1 the values of the mātaimai will not be compromised as yellowfin tuna are part of an oceanic stock. No area has been closed or fishing method restricted for customary fishing purposes in YFN 1 that would affect the fishery. No restrictions have been placed on fishing in any area within the YFN 1 for recreational interests (ss 21(4) and (5)).
- 48 The information used to develop proposals for yellowfin tuna relies on overseas assessments of the stock (which are uncertain) and information from commercial catches, which is limited with respect to evaluating levels of sustainable harvest. MFish notes however that uncertainty in information is not a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act (s 10).

Preliminary recommendations

- 49 MFish recommends that the Minister:
- a) **Agrees** that the purpose of the 1996 Act is better achieved by setting a TAC for yellowfin tuna otherwise than in accordance with s 13(2).
 - b) **Agrees** to add yellowfin tuna to the Third Schedule and set a TAC pursuant to s 14 of the 1996 Act.
 - c) **Agrees** to set a TAC for yellowfin tuna of 313 tonnes and within this set:
 - i) A customary allowance of 15 tonnes;
 - ii) A recreational allowance of 30 tonnes;
 - iii) An allowance of 5 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 263 tonnes.
 - d) **Agrees** to set a deemed value for yellowfin tuna of \$ 7.92 per kg.
 - e) **Agrees** that differential deemed values apply.
 - f) **Agrees** to consequential amendments to the Fisheries (Reporting) Regulations.

ANNEX ONE

Species information

Species biology

- 50 Yellowfin tuna (*Thunnus albacares*) is widespread in tropical and subtropical waters. It averages between 60-120 cm and can reach over 200 cm in length. Yellowfin tuna is a migratory oceanic species found in the northern waters of New Zealand on a seasonal basis, an exception is the Kermadec FMA in which yellowfin tuna are thought to be present year round.
- 51 Yellowfin tuna is listed as a highly migratory species in Annex 1 of UNCLOS and by reference in the Western and Central Pacific Fisheries Convention (WCPFC).
- 52 Participating countries in the Preparatory Conference establishing the Western and Central Pacific Fisheries Commission (Prepcon) have urged states to exercise reasonable restraint in respect of any increase in fishing effort and capacity with regard to the reported status of highly migratory stocks. As yet there are no specific international obligations with regard to management of yellowfin tuna.

Fisheries characteristics

Commercial catch

- 53 Yellowfin tuna is occasionally targeted in the New Zealand EEZ but is primarily taken as a bycatch in the troll and longline fishery for albacore and bigeye tuna in FMAs 1 and 9 (and historically FMA 10). Yellowfin are not targeted by purse seine in the New Zealand EEZ.
- 54 Domestic and foreign reported landings (tonnes) of yellowfin for all FMAs are shown in Table 1 below. Annual catches are variable with peak catches in 1986–87 (domestic and foreign landings combined) and in 1995–96 (domestic fleet only). The low reported landings from 1990 to 1993 are associated with the cessation of foreign-licensed fishing and the development of a domestic tuna longline fleet.
- 55 The most recent landings of yellowfin tuna have been low. These low years are associated with anecdote from the fishery suggesting a decline in availability in recent years. The declining catch of yellowfin tuna is however, also associated with a similar decline in reported landings of bigeye tuna for a similar period and may well be an artifact of a decrease in the target fishery or alternatively environmental factors affecting the distribution of both species in New Zealand fisheries waters.

Table 1. Reported landings (tonnes) of yellowfin tuna taken from New Zealand fisheries waters by foreign and domestic fleets

Fishing Year	Foreign licensed			Domestic	Total
	Japan	Korea	Total		
79-80	12.0		12.0		12.0
80-81	84.4	33.2	117.6		117.6
81-82	90.0	7.3	97.3		97.3
82-83	23.6	9.3	32.9		32.9
83-84	47.0	15.5	62.5		62.5
84-85	21.6	82.1	103.7		103.7
85-86	98.4	3.8	102.2		102.2
86-87	147.0	42.2	189.2	5.6	194.8
87-88	39.8	53.5	93.3	11.6	104.9
88-89	12.0	1.8	13.8	12.8	26.6
89-90	32.9		32.9	19	51.9
90-91	15.2		15.2	6.3	21.5
91-92	0.2		0.2	19.8	30.0
92-93	0.0		0.0	11.8	11.8
93-94	0.0		0.0	159.7	159.7
94-95	0.0		0.0	114.5	114.5
95-96	0.0		0.0	193.4	194.4
96-97	0.0		0.0	159.5	159.5
97-98*	0.0		0.0	105.3	105.3
98-99*	0.0		0.0	174.7	174.7
99-00*	0.0		0.0	100.6	100.6
00-01*	0.0		0.0	126.6	126.6
01-02*	0.0		0.0	51	61.0
02-03*	0.0		0.0	42.1	42.1

* LFRR totals for domestic catch

Recreational and customary catch

- 56 There are no estimates of non-commercial catch available.
- 57 Yellowfin tuna is a prized species among recreational anglers. It is highly sought after on a seasonal basis along the northeastern coast of the north island and is a species that is tagged and released by recreational anglers as part of the MFish/NZBGFC Gamefish Tagging Program. Overall (by the end of 2001–02 year) there have been eight yellowfin tuna recaptures from 876 releases from this programme².
- 58 Yellowfin is not known to be a species of particular significance for Māori customary fishing.

² Holdsworth J and Saul P. 2003. New Zealand billfish and gamefish tagging 2001-02. New Zealand Fisheries Assessment Report

Regulatory framework

- 59 The regulatory framework specific to yellowfin tuna includes specific reporting requirements for this species. Regulations apply to the method (minimum standards for seabird mitigation) and specific and general regulations apply if foreign owned fishing vessels are operated in the tuna longline fishery (Part 2 of the Fisheries (Commercial Fishing) Regulations 2000).

Fisheries assessment

- 60 The Precon has charged a scientific coordinating group with providing interim scientific advice on the status of Pacific tuna species. A working group (WGII) of the Precon has considered recent scientific advice on the stock status of yellowfin tuna and has reported the results as follows:

“While spatial patterns of exploitation remain uncertain, it appears some areas in the equatorial regions may be over-fished, and in these areas management actions may be required. While recognizing continuing uncertainties with the current yellowfin stock assessment, WG.II recommends that to reduce the risk of the yellowfin stock becoming over-fished further increases in fishing mortality (particularly on juvenile yellowfin) in the WCPO should be avoided.”

- 61 It is of note that the main concern with regard to stock status is focussed on equatorial regions of the central and western Pacific. However, any potential for expansion in the fishery for yellowfin tuna within New Zealand fisheries waters must be considered within the context of the requirement to exercise reasonable restraint.

Associated fisheries

- 62 Yellowfin tuna is primarily taken as a bycatch of tuna longline fishing in northern waters. Key associated fisheries are proposed for introduction into the QMS on 1 October 2004. The main target species of tuna longline fishing are bigeye tuna, southern bluefin tuna and albacore. Southern bluefin tuna and bigeye tuna are to be introduced into the QMS on 1 October 2004. Albacore will be proposed for introduction into the QMS on 1 October 2005.
- 63 Key bycatch species are swordfish, mako shark, blue shark, porbeagle shark, moonfish, Ray's bream and yellowfin tuna. These species are also to be introduced into the QMS on 1 October 2004.
- 64 There are, however, a suite of species that are unlikely to enter the QMS in the short term. Our knowledge of these species is limited. There is a risk that the tuna longline fishery will affect the long-term viability of these species. Tuna longline fisheries also occasionally catch fur seals, cetaceans and turtles within New Zealand fisheries waters. There are therefore potential impacts on associated and dependent species, biodiversity and protected species that will require monitoring and possibly future management action. The entry of yellowfin tuna into the QMS will improve our ability to address these issues by requiring the incorporation of any new information as it comes to hand in the process of determining catch limits for the fishery.

Environmental issues

- 65 Harvesting of tunas may have impact with regard to predator/prey interactions and trophic dynamics as tunas feed on a variety of fish and other marine species. Understanding of food web relationships is still at an early stage, but MFish considers that, if evidence emerges of impacts on biodiversity from harvesting of yellowfin tuna, this can be managed by setting a TAC within the QMS or alternative management measures based on international cooperation where appropriate.
- 66 There is also a non-fish bycatch associated with the surface longline fishery. Fishing vessels sometimes capture seabirds that are chasing baited hooks, and the seabirds drown as the lines sink. Seabirds are also caught in trawl and other fisheries, but longliners are considered to be the main threat to several vulnerable albatrosses and other seabird species. The risks of seabird capture vary geographically and by species. An active programme is underway to mitigate and monitor the capture of seabirds in surface longline fisheries.
- 67 MFish has established standard environmental controls on line and trawl target fisheries to mitigate the impact of these fishing methods on seabirds. These include prohibitions on net sonde monitor cables and compulsory reporting of bycatch of protected species. New Zealand surface longline vessels are required to use tori lines of a specified standard. Vessels are using a variety of practices to reduce seabird bycatch including the use of artificial baits and the practice of setting longlines at night.
- 68 MFish and the Department of Conservation are developing a National Plan of Action (NPOA) for Seabirds that is expected to include measures that will apply to all New Zealand fishing vessels.

Current and potential research

- 69 There is no current or proposed research for yellowfin tuna in New Zealand waters. New Zealand actively participates in the process to assess this species in the Central and Western Pacific and catch information from the New Zealand fishery is provided in support of this process as required.

Social cultural and economic factors

- 70 Yellowfin tuna form an important and valuable bycatch of tuna longline fisheries. While there is currently no information to suggest that a target fishery exists in New Zealand waters, expansion in the catch of yellowfin tuna in conjunction with the development of the bigeye target fishery will provide economic benefit to the nation.
- 71 There is a potential overlap in fishing areas for yellowfin tuna in some parts of the QMA between commercial and non-commercial fishers. Rules may be required to address spatial separation if conflicts arise as and when the fishery develops. Vehicles to provide these rules include fisheries plans, the dispute resolution procedures and the customary provisions of the 1996 Act.

YELLOWFIN TUNA – FINAL ADVICE

Initial proposals

- 1 It was proposed to add yellowfin tuna to the Third Schedule and set a TAC pursuant to section 14 of the Fisheries Act 1996 (the 1996 Act).
- 2 The proposed options for a TAC, allowances, TACC, and other management measures for yellowfin tuna, were as follows:

Proposed TAC, TACC, and allowances for yellowfin tuna, YFN 1 (tonnes).

Stock	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC *
YFN 1	268	15	30	4	219
OR					
YFN 1 #	313	15	30	5	263

* TAC/TACC options based on best annual catch in the most recent five years plus 25% OR plus 50% with the addition of allowances.

MFish preferred option

- 3 It was further proposed to:
 - a) Amend reporting regulations to take account of the decision to set a single QMA for yellowfin tuna;
 - b) Set a deemed value of \$7.92 for yellowfin tuna; AND
 - c) Apply differential deemed values.

Submissions

- 4 Submissions were received on the yellowfin tuna proposals from the following submitters:
 - **Seafood Industry Council (SeaFIC)**
 - **Sanford Limited**
 - **Solander**
 - **Te Ohu Kai Moana (TOKM)**
 - **Te Rūnanga o Ōtākou**
 - **Tologa Bay East Cape Charters (TBECC)**
 - **New Zealand Big Game Fishing Council (NZBGFC)**
- 5 The specific submissions on the proposals for yellowfin tuna are summarised and addressed under the relevant headings below.

Biological and Fishery Information

Submissions

- 6 The submissions received did not raise any issues concerning the biological or fishery information for yellowfin tuna provided in the IPP (refer paras 50-64).

MFish response

- 7 MFish confirms its view on the biological and fishery information for yellowfin tuna provided in the IPP (refer paras 50-64).

Environmental Considerations

Submissions

- 8 No submissions were received on the environmental considerations relating to the setting of sustainability measures for yellowfin tuna outlined in the IPP at para 65-68.

MFish response

- 9 MFish confirms its view on the environmental considerations relating to the setting of sustainability measures for yellowfin tuna outlined in the IPP at para 65-68.

TAC management strategy

MFish initial position

- 10 MFish proposed that the purpose of the 1996 Act is better achieved by setting a TAC for yellowfin tuna otherwise than in accordance with s 13(2) and that a TAC is set pursuant to s 14 of the 1996 Act.

Submissions

- 11 Subject to its reservations regarding the entry of highly migratory species into the QMS, **TOKM** agrees that no attempt should be made to “manage” the fish found seasonally in New Zealand waters under the provisions of s 13 of the Act. To that extent TOKM agrees with the proposal to include all HMS on the Third schedule and set TACs pursuant to s 14.

MFish response

- 12 MFish confirms its view that the purpose of the 1996 Act is better achieved by setting a TAC for yellowfin tuna otherwise than in accordance with s 13(2) and that a TAC is set pursuant to s 14 of the 1996 Act. A recommendation to include yellowfin tuna on the Third Schedule is contained in separate advice.

TAC

Submissions

- 13 **TOKM** agrees to the proposal that TAC is based on 50% above highest reported recent commercial landings for the short term subject to the limits being kept under regular review and corrections applied as the fishery develops.
- 14 **Solander** assume that the TAC suggested by MFish has a sufficient threshold to ensure that there is no scaling back of provisional catch history (PCH) for this species. Solander submit that any scaling back to accommodate allocation to Maori and other allowances would be unfair given the arbitrary nature of the catch limits. On the basis that its assumption is correct Solander supports MFish's recommendation on the TAC.
- 15 **SeaFIC** place a reservation on its support of the proposed TACs for tuna species. SeaFICs support of the recommended TACs is conditional on the capacity of the TAC to satisfy people's PCH after accommodating all the requisite allowances and provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.
- 16 **SeaFIC** supports the MFish preferred option, which is a TAC of 313 tonnes
- 17 **Sanford Limited**, while expressing reservations regarding the entry of highly migratory species into the QMS, support the MFish preferred option of a TAC of 313 tonnes and a TACC of 263 tonnes for yellowfin tuna.
- 18 **Tolaga Bay East Cape Charters (TBECC)** opposes the setting of a TAC/TACC beyond recent reported landings on the basis that as well as risking an uncertain stock it also leaves the way open for the entry of overseas boats under international agreements if the quota is under caught. TBECC state that MFish has no idea of the numbers or tonnage that are available from year to year and is only assuming that there may be fish available to be caught in area 10. TBECC concludes that uncertainty over the stock size should result in very low quotas until such time as there is a level of certainty that stocks are increasing and can stand a TAC increase.

MFish response

- 19 The MFish initial position was that the TAC for yellowfin tuna be based on current utilisation and allowances. An initial preference for a TAC of 313 tonnes was proposed (based on a TACC of 263 tonnes and allowances of 50 tonnes). The TACC of 263 tonnes was based on a 50% increase in the best annual catch of the fishery in recent years (175 tonnes).
- 20 On the basis of submissions received MFish proposes higher allowances for non-commercial fishing (increased from the 45 tonnes proposed in the IPP to 90 tonnes). The TAC proposed in the IPP was based on estimates of current utilisation in the fishery. As these have changed, a higher TAC is recommended as a result. MFish considers that this increase presents no sustainability problems and maintains its preference for the higher of the TAC options proposed (increased to accommodate additional allowances). MFish recommends a TAC for yellowfin tuna of 358 tonnes.

- 21 The Solander assumption regarding no scaling back of PCH is correct in the case of yellowfin tuna. Proposals for a TAC/TACC for yellowfin tuna were developed independently from consideration of PCH for this species, however in this case the sum of PCHs for yellowfin tuna fits within the proposed TAC and TACC after having allowed 20% of the TACC for Maori. No reduction or scaling back in PCH will be required.

Allowances and TACC

Submissions

Customary Maori and recreational allowances

- 22 NZBGFC submit that yellowfin are an important component of recreational catch which is more variable than reported commercial landings. NZBGFC say that recreational fishers are far more dependant on yellowfin arriving and staying in accessible waters such as the Bay of Plenty. NZBGFC submit that the Bay of Plenty attracts fishers from a wide population base in the upper North Island and tourists from around the world.
- 23 NZBGFC submit that in some years yellowfin represent a significant proportion of recorded catch by gamefish clubs. For example in the 1996–97 season 27 clubs reported weighing a total of 5282 fish of all species, 44% of these (2325) were yellowfin. The average weight for the Bay of Islands Swordfish Club was 24.8 kg that year. NZBGFC clubs generally have a rule that yellowfin must exceed line weight or 15 kg to be accepted into the records. NZBGFC assume a conservative average weight of 20 kg, to suggest that the reported catch would be about 46.5 tonnes that season. NZBGFC submit that a large number of yellowfin caught by non-members or smaller than 15kg would have gone unreported that season. NZBGFC submit that the Minister must allow more than 30 tonnes for recreational yellowfin catch in good years.
- 24 **Te Runanga o Otakou (Inc)** submit that pursuant to the settlement Act the Minister of Fisheries is required to develop policies to help recognise the use and management practises of takatā whenua in the exercise of customary non-commercial fishing rights. Te Runanga o Otakou (Inc) propose that a minimum non-commercial allowance of 25% of the TAC is set for all species proposed for introduction into the QMS of which 80% should be made available for customary Maori fishing. Te Runanga o Otakou (Inc) submit that a customary allocation does not require a harvest to be deemed to be utilised traditionally.
- 25 **TOKM** submit that the customary allowance of 15 tonnes proposed for yellowfin tuna is too high.

Allowances for other sources of mortality

- 26 SeaFIC questions the need for the 5 tonne allowance for other sources of mortality (based on 2% of the TACC) as too high. SeaFIC proposes that, in the absence of specific estimates, a reduction to 3 tonnes and an increase of 2 tonnes in the TACC.

TACC

- 27 **NZBGFC** oppose the 263 tonne TACC as this will allow a significant expansion in the commercial yellowfin fishery prior to any consideration of the conflict with non-commercial fishery. NZBGFC state that the highest annual commercial catch in the last 5 years was 175 tonnes, however the average annual catch over the last five years was 100 tonnes and the average yellowfin catch over the last 3 years (as used in the shark catch histories) is 76 tonnes. Therefore NZBGFC submit that MFish is proposing a 160% increase over the five year average catch, or a 250% increase in the average catch over the last three years, and only when commercial interests want to increase their catch still further would some form of spatial agreement be considered.
- 28 NZBGFC submit that there are quite adequate mechanisms in the QMS to allow for the expansion of new or developing fisheries. Firstly, there is provision under s 14 of the Act for an in season increase to the TAC if the abundance of yellowfin suggests more may be taken. Secondly an Adaptive Management Programme could be used to provide for the expansion in new and developing fisheries while making provision for data collection, other users and environmental impacts. Thirdly increases in TACC can be considered when they are required. There is no need to sideline other management considerations indefinitely by setting a TACC that is far higher than can be taken by the restructured domestic fleet.
- 29 The NZBGFC submits that the MFish proposal suggests that a new or exploratory fishery for bigeye and yellowfin could be developed in the Kermadec area. New Zealand is a signatory to the FAO 'Code of Conduct for Responsible Fishers'. The Code states that: *"In the case of new or exploratory fisheries, States should adopt as soon as possible cautious conservation and management measures, including, inter alia, catch limits and effort limits. Such measures should remain in force until there are sufficient data to allow assessment of the impact of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment should be implemented. The latter measures should, if appropriate, allow for the gradual development of the fisheries"*. NZBGFC says that MFish has allowed the rapid expansion of the surface longline fishery in the late 1990s and is now asking stakeholders to support issuing quotas in excess of the maximum catch.
- 30 The NZBGFC submit that the IPP also mentions *"international obligations to exercise reasonable restraint in the development of HMS"* (highly migratory species). This relates to resolutions passed by the Preparatory Conference for the Commission for the Conservation of Highly Migratory Fish Stocks in the Western and Central Pacific. The NZBGFC asks how New Zealand can ask other countries to show restraint in the development of their highly migratory species when it has been promoting the unconstrained expansion of tuna fisheries (except southern bluefin) and allowed the illegal expansion of the swordfish target fishery. NZBGFC submit that the MFish proposal to set the TACC at 150% of the best reported catch is inconsistent with these obligations.
- 31 The NZBGFC submits that setting the TACC too high will drive down the value of tuna quota, shift control to the big companies or eventually lead to pressure to allow access to foreign licence vessels again. NZBGFC submit that the TACC for yellowfin tuna should be set at 193 tonnes which is the maximum historic catch by domestic

vessels from the 1995–96 season. NZBGFC say that increases in commercial swordfish and tuna landings should be dealt with using the Adaptive Management Programme which would make provision for data collection, other sectors and environmental impacts.

MFish response

Customary Maori and recreational allowances

- 32 The NZBGFC has provide a detailed assessment of an appropriate allowance for recreational fishing for yellowfin. MFish concludes that this is better information on which to base a recreational allowance. Based on this submission MFish proposes that a higher allowance is set and proposes an allowance of 60 tonnes for recreational fishing. The allowance for customary Maori fishing (based on 50% of the recreational allowance) also changes as a result (increased from 15 to 30 tonnes). MFish notes the TOKM concern that an allowance for customary fishing of 15 tonnes was too high. In the absence of quantitative information on customary catch MFish has applied policy considerations to set the allowance as a proportion of the recreational allowance. These assume that yellowfin tuna is a known customary catch but the stock is of no particular importance to Maori.
- 33 MFish notes the view of Te Runanga o Otakou (Inc) but concludes that a standard approach to setting allowances in the manner suggested is not appropriate. Rather a case-by-case consideration is indicated. This submission is addressed in further detail in the generic section of this advice.

Allowances for other sources of mortality

- 34 MFish based its proposal for an allowance for other sources of fishing related mortality (5 tonnes) on observed information from the fishery. This allowance is over and above the TACC proposed for the fishery. MFish does not accept that the SeaFIC proposal to transfer part of this allowance to the TACC has any basis. MFish confirms its view that an allowance for other sources of fishing related mortality should be set and the best available information from past observations of the fishery suggests that this should be 2% of the TACC (5 tonnes)

TACC

- 35 NZBGFC and TBECC are strongly opposed to the TACC proposed as a preferred option suggesting that it is inconsistent with international obligations and discounts the interests of recreational fishers. MFish does not agree. New Zealand has both rights and obligations as a coastal state. The rights include the ability to develop fisheries that are found within coastal waters. Contrary to the view of TBECC and NZBGFC a high TACC will not provide for foreign licensed access if not fully fished. Current foreign licensed provisions contained in Part V of the Act only provide for foreign licensed access for a species subject to the QMS if ACE is not fully allocated to domestic interests. MFish considers that this prospect is unlikely. MFish notes that proposals for new foreign licensed legislation for highly migratory species are currently being considered by select committee. Proposals are that foreign licensed fishing is excluded from the bounds of the TAC and TACC . In either circumstance, the New Zealand obligation to provide foreign licensed access is more likely to be

argued if there is a case that the fishery in New Zealand waters is not fully exploited by domestic interests that is, the TACC is low with respect to the local abundance of the resource.

- 36 MFish notes that the proposal for a TACC beyond the level of past landings is based on a number of factors. These include the facts that the distribution of yellowfin tuna is likely to be Pacific wide and this species is only seasonally present in New Zealand fisheries waters. MFish considers that the potential for yellowfin catch in New Zealand fisheries waters has not been fully explored because of competitive effects in the tuna longline fishery.
- 37 A further factor is the relatively little fishing by domestic interests within the waters of the Kermadec Fishery Management Area. This area has historically supported bigeye tuna catches by foreign licensed fleets and to this extent is not the exploratory fishery suggested in submission by NZBGFC.
- 38 There is a national interest in developing the fisheries for highly migratory species within New Zealand fisheries waters prior to the imposition of any international management controls to be implemented by way of the Western and Central Pacific Fisheries Commission once formed. To this extent MFish does not consider that yellowfin tuna fits the characteristics for an Adaptive Management Program at this stage of its development.
- 39 Information will be available from fishing to assess catch rates and catch distributions under the proposed TACC. Further MFish has an ongoing observer program to collect biological information from the fishery for both target and bycatch species. MFish confirms its view that the TACC proposed is not inconsistent with international obligations and that the potential for expansion in the fishery is consistent with the current, albeit limited information on the distribution of yellowfin in New Zealand fisheries waters. MFish recommends a TACC at the level proposed in the IPP (263 tonnes). MFish notes the specific concerns of NZBGFC in relation to spatial conflict between recreational and commercial fisheries for yellowfin tuna and these are addressed below.

Social cultural and economic factors

Submissions

- 40 **NZBGFC** submit that there is potential for conflict in areas where longline fishing overlaps with sport fishing. This area of conflict is not something the QMS can fix. Voluntary agreements have been tried in the past but have failed as a flood of new entrants joined the commercial fishery in the 1990s. Recreational fishers have complained of having to fish around a number of longlines in the eastern Bay of Plenty in years when yellowfin were around (Bert Lee, Charter Skipper, pers comm). NZBGFC say that a more enforceable area separation is required as entry to the QMS will make yellowfin a longline target species.
- 41 NZBGFC submit that there is also the issue of how many yellowfin are intercepted by New Zealand surface longliners before they reach the Bay of Plenty. Expanding surface longlining in the Kermadec fisheries management area as suggested in the IPP

will result in many more yellowfin being intercepted on their migration to New Zealand and fewer fish reaching the coastal waters.

- 42 NZBGFC submit that the IPP acknowledges that there is potential for spatial conflict in this fishery unless it is managed (Para 17). NZBGFC agree, as it has occurred in some seasons already. NZBGFC submit that the only solution alluded to in the IPP is “*the yellowfin fishery may require inter-sectorial spatial agreement if further expansion in commercial fishing is to occur*”. NZBGFC say that this however is a totally inadequate response given that MFish is proposing a significant expansion in the fishery.

MFish response

- 43 There is currently no statutory provision to determine spatial management measures while setting sustainability measures. Further, it is not currently known whether an expansion in fishing for yellowfin tuna within the New Zealand coastal zone will create spatial conflicts with recreational fisheries.
- 44 NZBGFC is not correct in saying that matters of spatial allocation can only be addressed in the context of an Adaptive Management Programme. While these are not matters that can be addressed in the setting of sustainability measures for a stock, the dispute procedures of the 1996 Act are available at any stage if recreational fishers consider that their fishing interests are adversely affected by commercial fishing.
- 45 The approved dispute procedure is intended to provide a process for stakeholders to resolve disputes without recourse to regulation. If a dispute remains unresolved the Minister of Fisheries can be asked to resolve that dispute. An important element of the dispute procedure is that if one party to the dispute decides not to participate in the process the Minister of Fisheries can still be asked to make a determination. A lack of cooperation in addressing recreational concerns on the part of industry is not able to impede the process.
- 46 Once yellowfin (and other tuna longline target species) is introduced into the QMS MFish expects that there will be some rationalisation and consolidation in the fishery. The commercial stakeholders (quota owners) will be more readily identifiable and MFish anticipates that the development of stakeholder management arrangements will be facilitated. This will in turn improve the prospects of stakeholder agreed resolution to any concerns regarding spatial conflict that may occur in the fishery.

Other management measures

Submissions

- 47 **TOKM** recommend that all highly migratory species including yellowfin tuna be added to the Sixth Schedule on the basis that the benefits outlined for southern bluefin tuna should apply to all species.
- 48 **SeaFIC** submit that the provisions of the Sixth Schedule should apply to all highly migratory species.

MFish response

- 49 In the absence of submissions to the contrary MFish confirms its view that:
- a) Yellowfin tuna is added to the Third Schedule (by Order in Council) as species for which it is not possible to estimate MSY. A recommendation to this effect is contained in separate advice; and
 - b) Consequential amendments to the Fisheries (Reporting) Regulations 1999 are made to reflect the decision to introduce yellowfin tuna into the QMS.
- 50 MFish did not propose that yellowfin tuna is added to the Sixth Schedule of the 1996 Act (this schedule provides for the release of quota species to the sea subject to specified conditions).
- 51 As a general rule MFish considers that quota species once caught should be retained unless there are good reasons for an exemption. The use of the Sixth Schedule in the case of some highly migratory species has a specific rationale.
- 52 MFish has proposed the addition of only one tuna species, southern bluefin tuna, to the Sixth Schedule. This proposal is specifically intended as a mechanism to assist fishers to remain within the national allocation determined for this species. MFish notes that the use of the Sixth Schedule for southern bluefin tuna has been opposed by some industry in submission as they consider that this provision will be abused potentially leading to higher mortality on the stock.
- 53 MFish does not consider that there are good reasons to provide for the release of yellowfin tuna using provisions of the Sixth Schedule and without such reasons the general rule requiring the landing of all quota catch should prevail. The TACC proposed will ensure that sufficient ACE is available to cover expected catches in the short term. The level of deemed value proposed is not punitive and strikes a balance between the objectives of ensuring that fishers do not discard catch and encouraging fishers not to fish beyond the level of available ACE.

Deemed value and overfishing thresholds

Submissions

- 54 **TOKM** agrees that the deemed value rate for yellowfin tuna should be the standard “all other species” rate of 75% of port price.

MFish response

- 55 MFish proposed a deemed value for yellowfin tuna \$7.92 (based on 75% of the port price as an “all other fishstocks” category species), that differential deemed values apply and that no overfishing threshold is set.
- 56 MFish confirms its view that yellowfin fits within the definition of “all other fishstocks” and that deemed values should be set at 75% of port price. Further in accordance with the policy provisions differential deemed values (but no overfishing threshold) should apply in order to limit the incentives for individual fishers to continue fishing in excess of annual catch entitlement.

- 57 MFish notes that new port price information is available to set deemed values. The port price for yellowfin tuna determined for the 2003 year is \$8.99 per kg. This is less than the port price (\$11.56 per kg) used to develop the proposal in the IPP for a deemed value for yellowfin tuna. MFish considers that new port price information is the best available and recommends a deemed value for yellowfin tuna of \$6.74 per kg.

Legal Obligations

- 58 The statutory considerations that must be taken into account when setting a TAC and allowances for yellowfin tuna were identified in the IPP (refer to IPP para 37-48). No additional information has come to hand regarding these considerations. MFish confirms that its position on legal obligations remains as stated in the IPP.

Recommendations

- 59 MFish recommends that: you
- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for yellowfin tuna otherwise than in accordance with s13(2) of the 1996 Act.
 - b) **Agree** to set a TAC for yellowfin tuna pursuant to s 14 of the 1996 Act.
 - c) **Agree** to set a TAC for yellowfin tuna of 358 tonnes and within this set:
 - i) A customary allowance of 30 tonnes;
 - ii) A recreational allowance of 60 tonne;
 - iii) An allowance of 5 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 263 tonnes.
 - d) **Agree** to set a deemed value for yellowfin tuna of \$6.74 per kg.
 - e) **Agree** that differential deemed values apply.
 - f) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

FINAL RECOMMENDATIONS

Bigeye Tuna

1 MFish recommends that you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for bigeye tuna otherwise than in accordance with s13(2) of the 1996 Act.
- b) **Agree** to set a TAC for bigeye tuna pursuant to s 14 of the 1996 Act.
- c) **Agree** to set a TAC for bigeye tuna of 725 tonnes and within this set:
 - i) A customary allowance of 4 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance of 14 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 699 tonnes.
- d) **Note** that there will be a small economic impact associated with this option.

OR

- e) **Agree** to set a TAC for bigeye tuna of 740 tonnes and within this set:
 - i) A customary allowance of 4 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance of 14 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 714 tonnes.
- f) **Agree** to set a deemed value for bigeye tuna of \$15.14 per kg.
- g) **Agree** that differential deemed values apply.
- h) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

Blue Shark

2 MFish recommends you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for blue shark otherwise than in accordance with s 13(2).
- b) **Agree** to set a TAC for blue shark pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 2 080 tonnes for BWS 1 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 20 tonnes;
 - iii) An allowance for other fishing-related mortality of 190 tonnes; and
 - iv) A TACC of 1 860 tonnes.

- d) **Agree** to add blue shark to the Sixth Schedule of the 1996 Act to allow for return to the sea with the following conditions
That they are:
 - i) Likely to survive
 - ii) Returned to the same waters from which they are taken; and
 - iii) Are returned as soon as practical.
- e) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.
- f) **Agree** to set the deemed value for BWS 1 at \$0.15/kg.
- g) **Note** that a separate review of the conversion factor for blue shark, landed as fins only, is in train.

Kahawai

3 MFish recommends that you

- a) **Note** the contents of this advice and attached stakeholder submissions on kahawai management proposals,
- b) **Note** that the information regarding the status of kahawai stocks is uncertain
- c) **Note** that having regard to the uncertainty surrounding stock status, MFish has a preference for the lower of the TAC options proposed,
- d) **Note** that having regard to the uncertainty in estimates of utility for kahawai, and the views of stakeholders, MFish has a preference for the allowances and TACCs within the lower of the TACs proposed to be determined in proportion to the current use of recreational and commercial sectors and;

EITHER

- e) **Agree** to set a TAC of 4,235 tonnes for KAH 1 and within that TAC set:
 - i) A customary allowance of 550 tonnes;
 - ii) A recreational allowance of 2,195 tonnes;
 - iii) An allowance for other fishing-related mortality of 85 tonnes; and
 - iv) A TACC of 1,405 tonnes.
- f) **Agree** to set a TAC of 1,970 tonnes for KAH 2 and within that TAC set:
 - i) A customary allowance of 205 tonnes;
 - ii) A recreational allowance of 800 tonnes;
 - iii) An allowance for other fishing-related mortality of 40 tonnes; and
 - iv) A TACC of 925 tonnes.
- g) **Agree** to set a TAC of 1,190 tonnes for KAH 3 and within that TAC set:
 - i) A customary allowance of 125 tonne;
 - ii) A recreational allowance of 510 tonne;
 - iii) An allowance for other fishing-related mortality of 20 tonne; and

- iv) A TACC of 535 tonnes.
- h) **Agree** to set a TAC of 16 tonnes for KAH 4 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.
- i) **Agree** to set a TAC of 1,330 tonnes for KAH 8 and within that TAC set:
 - i) A customary allowance of 125 tonnes;
 - ii) A recreational allowance of 500 tonnes;
 - iii) An allowance for other fishing-related mortality of 25 tonnes; and
 - iv) A TACC of 680 tonnes.
- j) **Agree** to set a TAC of 16 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.

OR

- k) **Agree** to set a TAC of 3,685 tonnes for KAH 1 and within that TAC set:
 - i) A customary allowance of 550 tonnes;
 - ii) A recreational allowance of 1,865 tonnes;
 - iii) An allowance for other fishing-related mortality of 75 tonnes; and
 - iv) A TACC of 1,195 tonnes.
- l) **Agree** to set a TAC of 1,705 tonnes for KAH 2 and within that TAC set:
 - i) A customary allowance of 205 tonnes;
 - ii) A recreational allowance of 680 tonnes;
 - iii) An allowance for other fishing-related mortality of 35 tonnes; and
 - iv) A TACC of 785 tonnes.
- m) **Agree** to set a TAC of 1,035 tonnes for KAH 3 and within that TAC set:
 - i) A customary allowance of 125 tonne;
 - ii) A recreational allowance of 435 tonne;
 - iii) An allowance for other fishing-related mortality of 20 tonne; and
 - iv) A TACC of 455 tonnes.
- n) **Agree** to set a TAC of 16 tonnes for KAH 4 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;

- iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.
- o) **Agree** to set a TAC of 1,155 tonnes for KAH 8 and within that TAC set:
 - i) A customary allowance of 125 tonnes;
 - ii) A recreational allowance of 425 tonnes;
 - iii) An allowance for other fishing-related mortality of 25 tonnes; and
 - iv) A TACC of 580 tonnes.
- p) **Agree** to set a TAC of 16 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.

AND

- q) **Agree** to set annual deemed values of:
 - i) KAH 1 \$0.66 / kg; and
 - ii) KAH 2, 3, 4, 8 & 10 \$0.61 / kg;
- r) **Agree** that differential deemed values apply;
- s) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns;
- t) **Note** that once kahawai becomes subject to the QMS fishing permit conditions applying purse seining catch limits and vessel restrictions on the taking of kahawai will no longer be applicable. Accordingly, the chief executive will revoke these fishing permit conditions;
- u) **Note** that if you elect to reduce the current use of kahawai MFish will initiate consultation with the recreational sector to determine the best method of achieving the required catch constraint.

Lookdown Dory

4 MFish recommends that you:

- a) **Agree** to set a TAC of 168 tonnes for LDO 1, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 168 tonnes.
- b) **Agree** to set a TAC of 614 tonnes for LDO 3, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;

- ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 614 tonnes.
- c) **Agree** to set a TAC of 1 tonne for LDO 10, and within the TAC set the following:
- i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 1 tonne.
- d) **Agree** to amend Part 1 of Schedule 3 of the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for lookdown dory to be used by fishers when completing their statutory catch returns.
- e) **Agree** to set an interim deemed value of \$0.21 per kg and an annual deemed value of \$0.42 per kg for the 2004-05 fishing year.

Mako Shark

5 MFish recommends you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for mako shark otherwise than in accordance with s 13(2).
- b) **Agree** to set a TAC for mako shark pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 512 tonnes for MAK 1 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 50 tonnes;
 - iii) An allowance for other fishing-related mortality of 46 tonnes; and
 - iv) A TACC of 406 tonnes.
- d) **Agree** to add mako shark to the Sixth Schedule of the Act subject to the conditions that they are:
 - j) Likely to survive;
 - ii) Returned to the same waters from which they are taken; and
 - iii) Are returned as soon as practical.
- e) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.
- f) **Agree** to set the deemed value for MAK 1 at \$0.15/kg.
- g) **Note** that a review of the conversion factor for mako shark fins is underway.

Moonfish

6 MFish recommends that you:

- a) **Agree** that the purpose of the Act is better achieved by setting a TAC otherwise than in accordance with s 13(2) for moonfish.
- b) **Agree** to set a TAC for moonfish pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 527 tonnes for MOO 1, and within this set:
 - i) A customary allowance of 0 tonnes,
 - ii) A recreational allowance of 0 tonnes,
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality, and
 - iv) A TACC of 527 tonnes.
- (f) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to prescribe a code for moonfish to be used by commercial fishers when completing their statutory catch returns.

7 **Agree** to set an annual deemed value for moonfish of \$0.50/kg.

Pacific Bluefin Tuna

8 MFish recommends that you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for Pacific bluefin tuna otherwise than in accordance with s13(2) of the 1996 Act.
- b) **Agree** that a TAC for Pacific bluefin tuna is set pursuant to s14 of the 1996 Act.
- c) **Agree** to set a TAC for Pacific bluefin tuna of 83 tonnes and within this set:
 - i) A customary allowance of 0.5 tonnes;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1.5 tonnes for other sources of fishing mortality;
 - iv) A TACC of 80 tonnes;
 - v) **Note** that the TAC proposed will result in a reduction in fishers individual provisional catch histories for Pacific bluefin tuna; and
 - vi) **Note** that the reduction in provisional catch history will have an economic impact on the fishing operations of some fishers.

OR

- d) **Agree** to set a TAC for Pacific bluefin tuna of 120 tonnes and within this set:
 - i) A customary allowance of 0.5 tonnes;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 2.5 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 116 tonnes.

- e) **Agree** to set a deemed value for Pacific bluefin tuna of \$27.75 per kg.
- f) **Agree** that differential deemed values apply.
- g) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

Parore

9 MFish recommends that you:

- a) **Agree** to set a TAC of 74 tonnes for PAR 1, and within this set:
 - i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 6 tonnes;
 - iii) An allowance of 4 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 61 tonnes.
- b) **Agree** to set a TAC of 4 tonnes for PAR 2, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 2 tonnes.
- c) **Agree** to set a TAC of 25 tonnes for PAR 9, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 2 tonnes;
 - iii) An allowance of 1 tonne for other sources of fishing-related mortality; and
 - iv) A TACC of 21 tonnes.
- d) **Agree** to set a TAC of 0 tonnes for PAR 10, and within this set:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 0 tonnes.
- e) **Agree** to include parore as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986.
- f) **Agree** to include parore as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.

- g) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to prescribe a code for parore to be used by commercial fishers when completing their statutory catch returns.
 - h) **Agree** to set for PAR 1, PAR 2, and PAR 10 an interim deemed value of \$0.16 per kg and an annual deemed value of \$0.31 per kg for the 2004–05 fishing year.
- 10 **Agree** to set for PAR 9 an interim deemed value of \$0.17 per kg and an annual deemed value of \$0.34 per kg for the 2004–05 fishing year.

Pipi – Whangarei Harbour

11 MFish recommends that you:

- a) **Agree** to set a TAC of 250 tonnes for PPI 1A and within the TAC set:
 - i) A customary allowance of 25 tonnes;
 - ii) A recreational allowance of 25 tonnes;
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 200 tonnes.
- b) **Agree** to remove reference to a 200 kg daily limit for commercial harvest of pipi in PPI 1A from Regulation 22A of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
- c) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to introduce a fishstock code for Whangarei pipi to be used by commercial fishers when completing their statutory catch returns.
- d) **Agree** pipi (PPI 1A) be added to Schedule 5A of the Fisheries Act 1996.
- e) **Agree** pipi (PPI 1A) be added to Sixth Schedule of the Fisheries Act 1996.
- f) **Agree** to set an interim deemed values of \$1.10 per kg and an annual deemed value of \$2.20 per kg for the 2004–05 fishing year.

Porae

12 MFish recommends that you:

- a) **Agree** to set a TAC of 75 tonnes for POR 1, and within this set:
 - i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 6 tonnes;
 - iii) An allowance of 4 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 62 tonnes.
- b) **Agree** to set a TAC of 9 tonnes for POR 2, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;

- iii) An allowance of 1 tonne for other sources of fishing-related mortality; and
 - iv) A TACC of 6 tonnes.
- c) **Agree** to set a TAC of 5 tonnes for POR 3, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1 tonne for other sources of fishing-related mortality; and
 - iv) A TACC of 2 tonnes.
- d) **Agree** to set a TAC of 4 tonnes for POR 10, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1 tonne for other sources of fishing-related mortality; and
 - iv) A TACC of 1 tonne.
- e) **Agree** to include porae as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986.
- f) **Agree** to include porae as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.
- g) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for porae to be used by commercial fishers when completing their statutory catch returns.
- h) **Agree** to set interim and annual deemed values for the 2004-05 fishing year as follows:
 - i) POR 1 – an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg;
 - ii) POR 2 - an interim deemed value of 0.35 per kg and an annual deemed value of \$0.69 per kg;
 - iii) POR 3 - an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg; and
 - iv) POR 10 - an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg.

Porbeagle Shark

13 MFish recommends you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for porbeagle shark otherwise than in accordance with s 13(2).
- b) **Agree** to set a TAC for porbeagle shark pursuant to s 14 of the Act.

- c) **Agree** to set a TAC of 249 tonnes for POS 1 and within that TAC set:
 - i) A customary allowance of 2 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 22 tonnes; and
 - iv) A TACC of 215 tonnes.
- d) **Agree** to add porbeagle shark to the Sixth Schedule of the Act subject to the conditions that they are:
 - x) Likely to survive
 - xi) Returned to the same waters from which they are taken; and
 - xii) Are returned as soon as practical.
- e) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.
- f) **Agree** to set the deemed value for POS 1 at \$0.15/kilogram.
- g) **Note** that a review is proposed of the conversion factors for porbeagle shark.

Ray's Bream

14 MFish recommends that you:

- a) **Agree** that the purpose of the Act is better achieved by setting a TAC for Ray's bream other than in accordance with section 13(2).
- b) **Agree** to set a TAC for Ray's bream pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 1 045 tonnes for RBM 1 and within that TAC set:
 - i) A customary allowance of 5 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 50 tonnes; and,
 - iv) A TACC of 980 tonnes.
- d) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns for Ray's bream.
- e) **Agree** to set an annual deemed value for Ray's bream of \$0.18/kg.
- f) **Note** that it is not proposed to set a differential deemed value or overfishing threshold for the Ray's bream stock.

15 **Note** that a carry forward of 10% of ACE is proposed for the Ray's bream stock.

Red Snapper

16 MFish recommends that you:

- a) **Agree** to set a TAC for RSN 1 of 140 tonnes, and within that TAC:
 - i) **Agree** to set a Maori customary allowance of 2 tonnes;

- ii) **Agree** to set a recreational allowance of 13 tonnes;
- iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality;
and
- iv) **Agree** to set a TACC of 124 tonnes.
- b) **Agree** to set a TAC for RSN 2 of 25 tonnes, and within that TAC:
 - i) **Agree** to set a Maori customary allowance of 1 tonne;
 - ii) **Agree** to set a recreational allowance of 2 tonnes;
 - iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality;
and
 - iv) **Agree** to set a TACC of 21 tonnes.
- c) **Agree** to set a TAC for RSN 10 of 4 tonnes, and within that TAC:
 - i) **Agree** to set a Maori customary allowance of 1 tonne;
 - ii) **Agree** to set a recreational allowance of 1 tonne;
 - iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality;
and
 - iv) **Agree** to set a TACC of 1 tonne.
- d) **Agree** to include red snapper as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986;
- e) **Agree** to include red snapper as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Fishing Area Amateur Fishing) Regulations 1986;
- f) **Agree** to set an annual deemed value for all the red snapper stocks at \$4.09 per kg;
- g) **Agree** that a differential deemed value applies; and
- h) **Agree** that the reporting regulations be amended to reflect the new fishstock codes for red snapper stocks.

Southern Bluefin Tuna

17 MFish recommends that you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for southern bluefin tuna otherwise than in accordance with s13(2) of the 1996 Act.
- b) **Agree** to set a TAC for southern bluefin tuna pursuant to s 14 of the 1996 Act.
- c) **Agree** to set a TAC for southern bluefin tuna of 420 tonnes and within this set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 4 tonne;
 - iii) An allowance of 2 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 413 tonnes.

- d) **Agree** to set a deemed value for southern bluefin tuna of \$46.92 per kg.
- e) **Agree** that differential deemed values apply.
- f) **Agree** to list southern bluefin tuna on the Sixth Schedule of the 1996 Act.
- g) **Agree** not to list southern bluefin tuna on Schedule 5A of the 1996 Act until the outcome of CCSBT consideration of an under and over fishing arrangement is known.
- h) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001 and the Fisheries (Recordkeeping) Regulations 1990.
- i) **Agree** to revoke the Fisheries (Southern Bluefin Tuna Quota) Regulations 2000.
- j) **Agree** to revoke Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001.

Spiny Dogfish

18 MFish recommends that you:

- a) **Agree** to set TACs for spiny dogfish pursuant to s 13 of the 1996 Act.
- b) **Agree** to set a TAC of 413 tonnes for SPD1 and within that TAC set:
 - i) A customary allowance of 39 tonnes;
 - ii) A recreational allowance of 39 tonnes;
 - iii) An allowance for other fishing-related mortality of 4 tonnes; and
 - iv) A TACC of 331 tonnes.
- c) **Agree** to set a TAC of 5 075 tonnes for SPD3 and within that TAC set:
 - i) A customary allowance of 115 tonnes;
 - ii) A recreational allowance of 115 tonnes;
 - iii) An allowance for other fishing-related mortality of 51 tonnes; and
 - iv) A TACC of 4 794 tonnes.
- d) **Agree** to set a TAC of 1 662 tonnes for SPD4 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 16 tonnes; and
 - iv) A TACC of 1 626 tonnes.
- e) **Agree** to set a TAC of 3 753 tonnes for SPD5 and within that TAC set:
 - i) A customary allowance of 8 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance for other fishing-related mortality of 37 tonnes; and
 - iv) A TACC of 3 700 tonnes.

- f) **Agree** to set a TAC of 1 983 tonnes for SPD7 and within that TAC set:
 - i) A customary allowance of 31 tonnes;
 - ii) A recreational allowance of 31 tonnes;
 - iii) An allowance for other fishing-related mortality of 19 tonnes; and
 - iv) A TACC of 1 902 tonnes.
- g) **Agree** to set a TAC of 392 tonnes for SPD8 and within that TAC set:
 - i) A customary allowance of 41 tonnes;
 - ii) A recreational allowance of 41 tonnes;
 - iii) An allowance for other fishing-related mortality of 3 tonnes; and
 - iv) A TACC of 307 tonnes.
- h) **Agree** to set a TAC of 2 tonnes for SPD10 and within that TAC set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 0 tonnes.
- i) **Agree** to amend the Sixth Schedule of the 1996 Act to include spiny dogfish as a species with provision for return-to-sea dead or live.
- j) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns for spiny dogfish.
- k) **Agree** to set deemed values for spiny dogfish at \$0.05/kg.
- l) **Note** that a carry forward of 10 % of ACE is proposed for spiny dogfish.

Swordfish

19 MFish recommends that you:

- a) **Agree** that the purpose of the Act is better achieved by setting a TAC for swordfish otherwise than in accordance with section 13(2) of the Act.
- b) **Agree** to set a TAC for swordfish pursuant to section 14 of the Act.
- c) **Agree** to set a TAC for swordfish of 919 tonnes and within this set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 20 tonnes;
 - iii) An allowance for other fishing-related mortality of 4 tonnes; and
 - iv) A TACC of 885 tonnes.
- d) **Agree** to set an annual deemed value for swordfish of \$4.25 per kg.
- e) **Agree** that differential deemed values apply.
- f) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

- g) **Agree** to introduce swordfish onto the Sixth Schedule with the following stated requirements for SWO 1:
 - i) Only swordfish that are smaller than 1.25 metre LJFL may be returned to the sea.
- 20 Only swordfish (less than 1.25 m LJFL) that are likely to survive and can be returned to the sea as soon as is practicable after being taken may be returned to the sea.

Yellowfin Tuna

- 21 MFish recommends that: you
 - a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for yellowfin tuna otherwise than in accordance with s13(2) of the 1996 Act.
 - b) **Agree** to set a TAC for yellowfin tuna pursuant to s 14 of the 1996 Act.
 - c) **Agree** to set a TAC for yellowfin tuna of 358 tonnes and within this set:
 - i) A customary allowance of 30 tonnes;
 - ii) A recreational allowance of 60 tonne;
 - iii) An allowance of 5 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 263 tonnes.
 - d) **Agree** to set a deemed value for yellowfin tuna of \$6.74 per kg.
 - e) **Agree** that differential deemed values apply.
 - f) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

Rose Grindley
for Chief Executive

Scott Williamson
for Chief Executive

Arthur Hore
for Chief Executive

APPROVED / NOT APPROVED / APPROVED AS AMENDED

Hon David Benson-Pope
Minister of Fisheries