Setting of Sustainability and Other Management Controls for Kahawai 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 kahawai stocks 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 this stock 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 year and units of measure for kahawai stocks 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 kahawai stocks to be introduced into the QMS on 1 October 2004

Species (code)	Quota Management Areas	Fishing year	Unit of measure
Kahawai	6 based on FMAs 1-4, 8, 10	1 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 kahawai stocks 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 kahawai stocks 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 kahawai stocks to be introduced into the QMS on 1 October 2004.

6 This paper is structured so that the **Initial Position** section is followed immediately by the **Final Advice** section.

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. This section is followed by another section from the IPP, titled Deemed Values and Overfishing Thresholds. 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 kahawai stocks 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 it 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, Mäori 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 Mäori 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 Bmsy 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. There 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, Mäori 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 Mäori above the level of recreational take	Catch level above the known recreational catch included
	No estimates but known to be of importance to Mäori	Catch level similar to known recreational catch included
	No estimates but known customary catch (and stock of no particular importance to Mäori)	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 were 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 Mäori;

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, Mäori 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 Mäori 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.

Mäori Customary Non-Commercial Allowance

74 There are no quantitative estimates of the size of Mäori 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 Mäori 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 Mäori 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 Minster 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

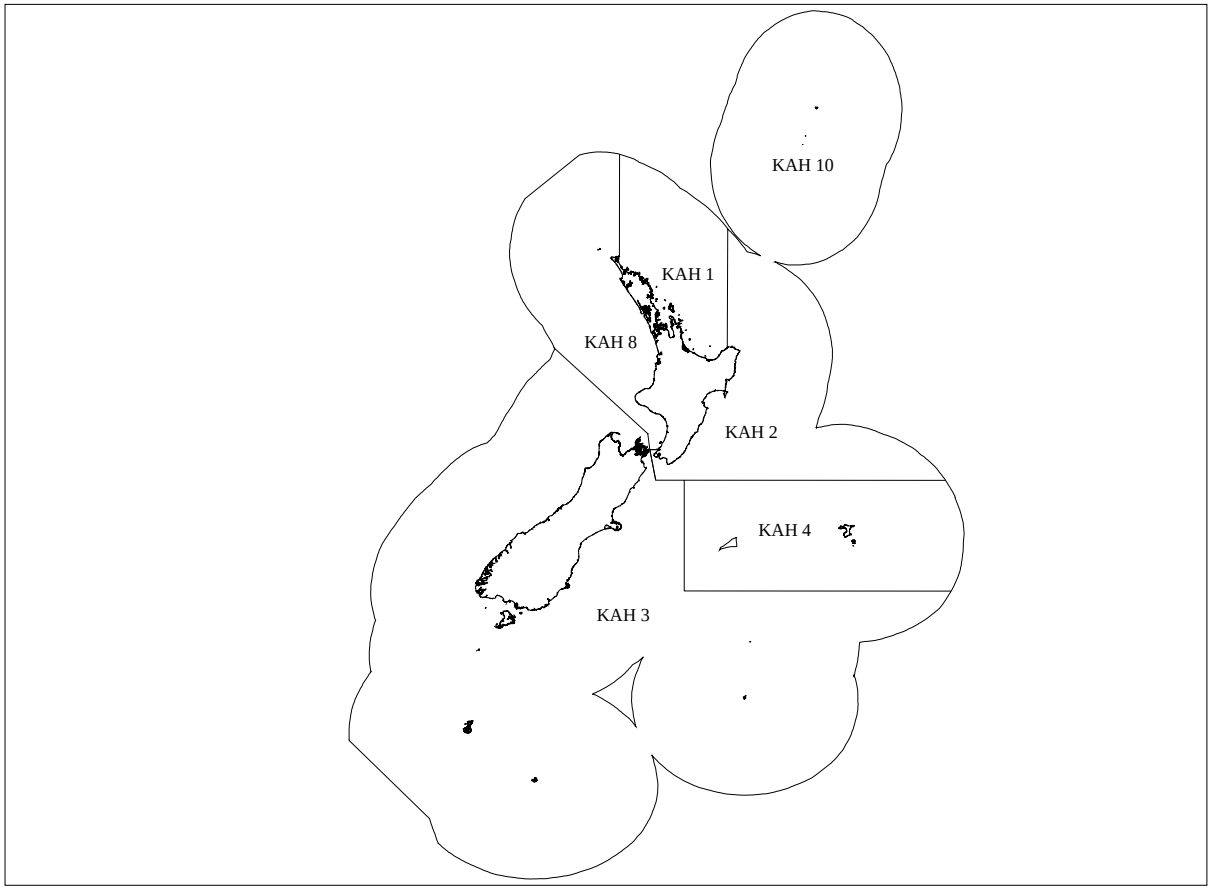
86 The intent of the quota management system is to provide a broad management framework that provides the opportunity to maximise efficient utilisation of fishing resources while ensuring sustainability. The introduction of a species into the QMS requires that a TAC and other management controls are 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.

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 QMAs 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 Mäori 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 Plenary[1].

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 tones) with 650 tonnes of this total set aside for Mäori. 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 Mäori, then current utilisation may be estimated on the basis of half the recreational catch. Kahawai is of considerable interest to Mäori 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 on 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 coincidently 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 Mäori 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.

Mäori customary allowance

39 The proposed customary allowances for each QMA are set out in Table1.

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 Mäori 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 Mäori, 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 Mäori. 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. Mäori have had an historic interest in kahawai and it is an important food source in some localities. MFish would welcome submissions, particularly from Mäori 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 agreements[2] and by an outcome of the set net review[3].

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 Mäori), 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 mätaitai 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 Mäori 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	QMA 1	2	3	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:

	Fishing Year								
Method	**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:

	Fishing year								
Method	**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

[a]Fishing 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.

	1991-1994		1996		1999-2000	
Year	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. Mäori 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 Mäori 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 (B_0) and biomass in 1996 (B_{1996}) 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 = pB_0 where p is determined from a method where the biomass does not go below 20% B_0 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 B_0, B_{MSY}/B_0, B_{1996}/B_0, 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 6 & 7		492	667 354
KAH 8	Central (West), Auckland (West)	8 & 9		634	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 predated 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 Mäori 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 Zealand[1]. It submits that kahawai have a unique role to play in terms of biodiversity and the interdependence of a broad

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

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 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 decades[2]. 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 disturbance[3]. 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 chicks[4].

22 In summary, the literature suggests that the potential for impacts on other aquatic life is more complex that 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.

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[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.

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 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 coincidently 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 $MCY_{base\ case}$ 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 $MCY_{sensitivity\ analysis}$ (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 $MCY_{sensitivity\ analysis}$ (8 200) down to approximately 7 600. For $MCY_{base\ case}$ the reduction using M=0.18 would be from 7 600 down to approximately 6 600[5].

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

[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.

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 1996[6], 1999–00[7] and 2000–01[8].

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 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

[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**.

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 Mäori 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 Mäori 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

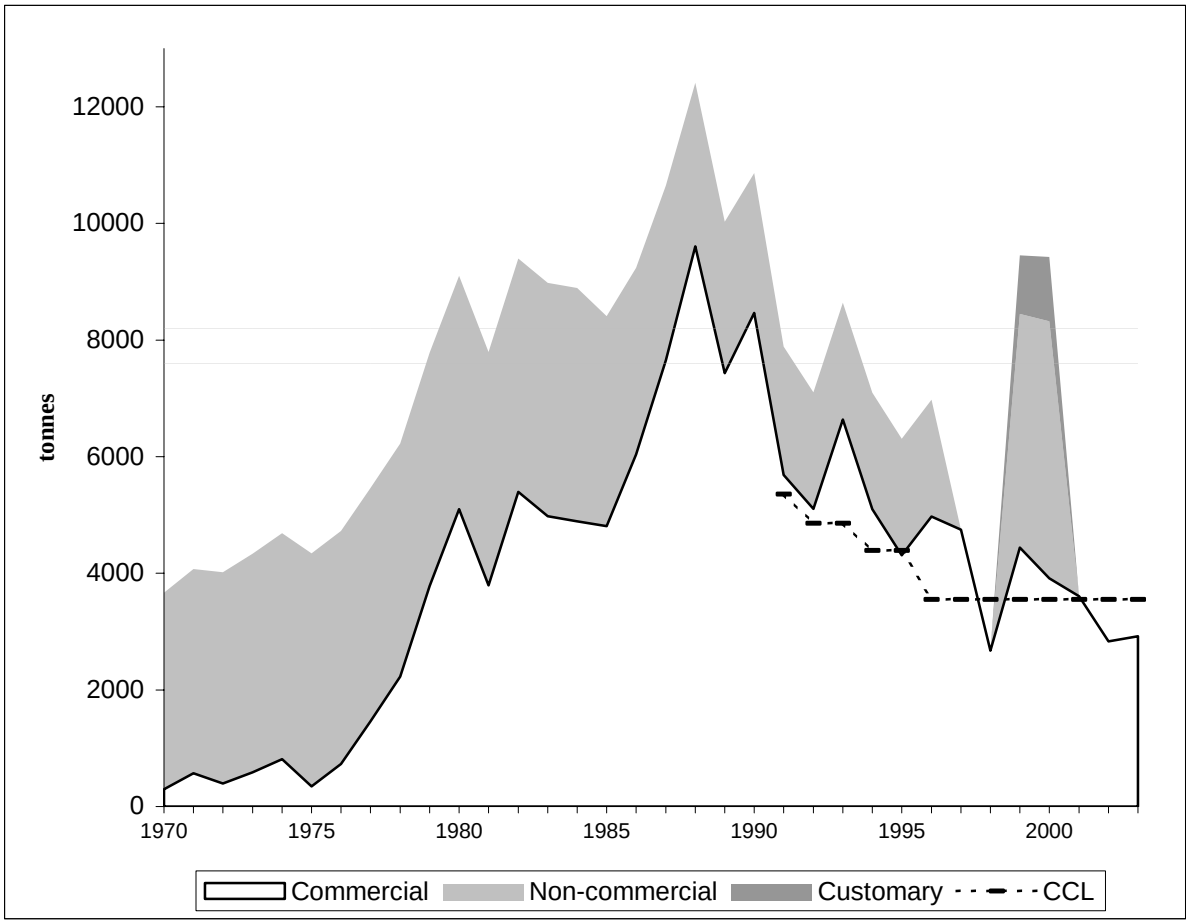
b) a similar voluntary agreement to cease fishing in Cloudy Bay and within one nautical mile of the coast north of Kaikoura. The latter area was an important part of the commercial fishery as kahawai schooled daily in this area as part of a diurnal migration between deep and shallow water, but were usually 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:

a) 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 utilisaton;

b) 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;

c) 8 200 tonnes on the basis of the $MCY_{sensitivity\ analysis}$ estimate (**Sanford)** apportioned between stocks on the basis of the distribution of catches and catch estimates;

d) 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)**;

e) 6 900 tonnes on the basis of a revised estimate of $MCY_{base\ case}$ (**Non-Commercial Fishers)** apportioned between stocks on the basis of the distribution of recreational catch estimates and the level of commercial bycatch; and

f) 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 there 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	510	960	18	1 210	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 Mäori 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 Mäori 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 Mäori 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.

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

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.

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 eight 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.

Mäori 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 Ngäti Kahungunu, Ngäti 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 Ngäti 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 takatä whenua in the exercise of customary non-commercial fishing rights. Te Rünanga o Ötäkou 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 20 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 whänau 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 Rünanga o Ötäkou 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) Sanford#	550	205	125	1	125	1	1 007
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 RFC*	2,000	750	550	4	400	3	3,707

\# 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 $MCY_{\text{sensitivity analysis}}$ (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 report[10]. 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 uncertainly 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 Ngäti Kahungunu, Ngäti 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 Mäori 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; and

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 advise 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

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 tonnes;

   ii) A recreational allowance of 510 tonnes;

   iii) An allowance for other fishing-related mortality of 20 tonnes; 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 tonnes; 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

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 tonne;

ii) A recreational allowance of 5 tonnes;

iii) An allowance for other fishing-related mortality of 0 tonnes; 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 tonne;

ii) A recreational allowance of 5 tonnes;

iii) An allowance for other fishing-related mortality of 0 tonnes; 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.

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	increased a lot
Percentage	88.1%	10.2%	1.5%	0.2%	0.0%

Size of kahawai have	increased	remained the same	decreased
Percentage	0.8%	17.3%	81.9%

Numbers of feeding schools are	much more frequent	more frequent	about the same number	less frequent	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 Waihau 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 doe 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; and

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; and

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 rate[11];

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; and

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

[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**.

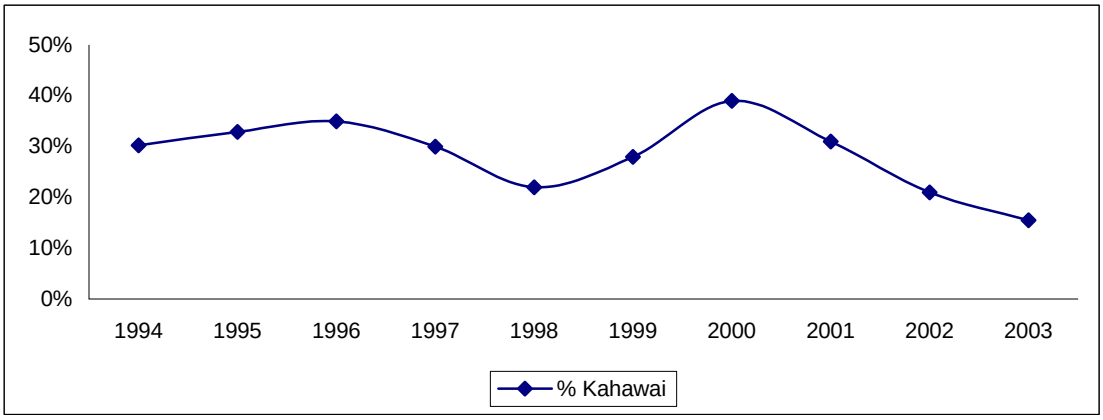
readership survey recording 47% of its respondents indicating that stocks had "declined significantly" and 32% that stocks had "declined a little". This suggests that not only has the total percentage of respondents perceiving stocks to have declined increased by 10% but that a greater percentage of 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 kahawai[12]. 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 areas[11].

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

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

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. 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 migration[13]. 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.

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

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 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.

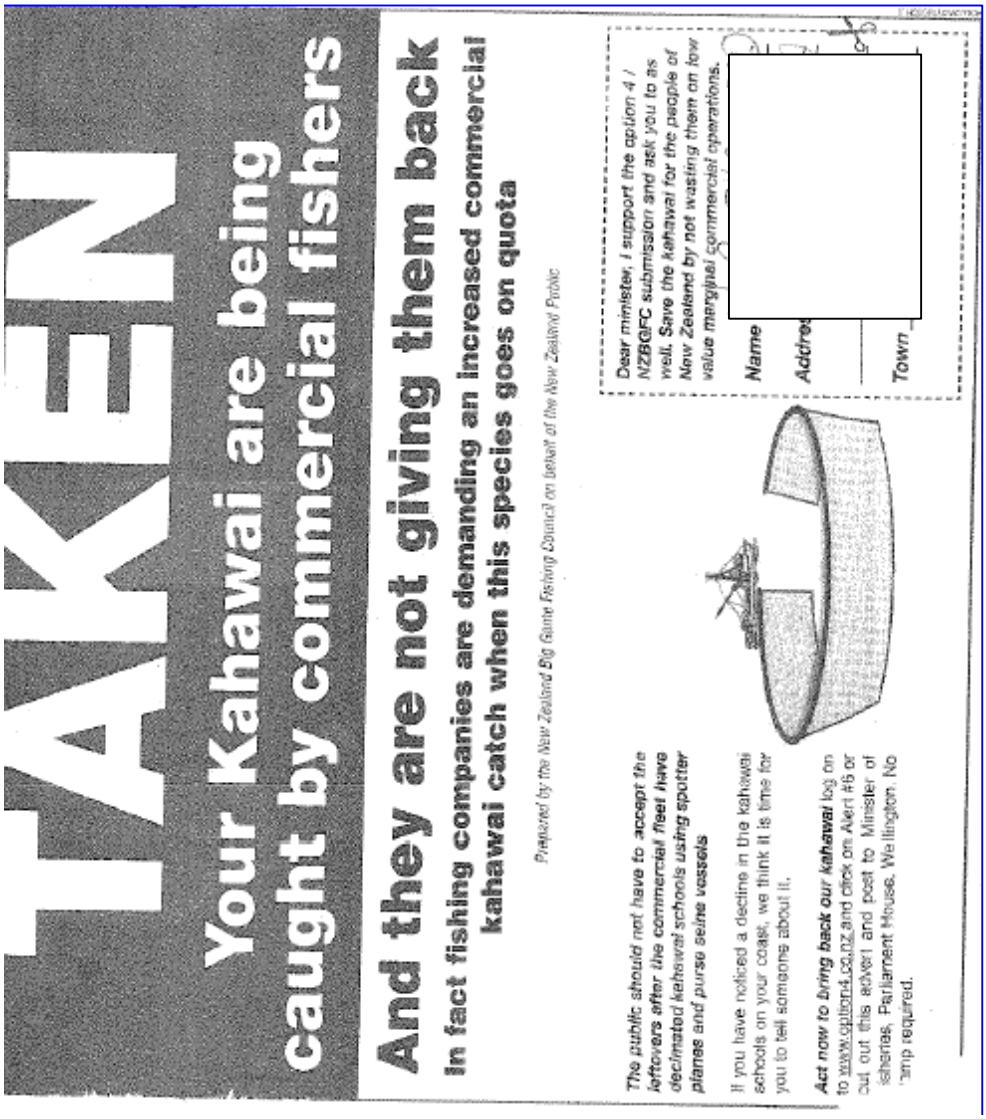
option4's position is clearly stated in our submission. Commercial fishers should be able to land kahawai caught as a genuine bycatch and have quota available to cover those landings. It is the industrial fishing method using spotter planes and purse seine vessels to target whole schools that has done 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!

ANNEX THREE



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