Ministry of
Fisheries
Te Tautiaki i nga tini a Tangaroa

FINAL ADVICE PAPER ALL KAHAWAI STOCKS (KAH 1, 2, 3, 4, 8 AND 10)

New Zealand Government

FINAL ADVICE PAPER

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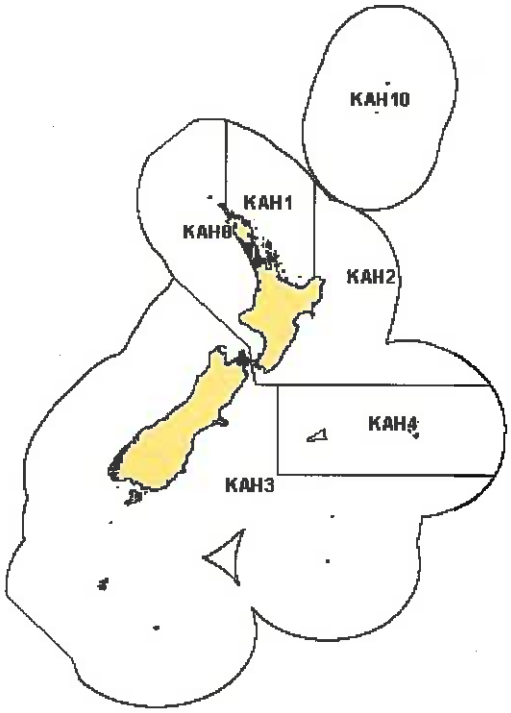
Figure 1: Quota Management Areas (QMA) for kahawai



Summary

1 The Ministry of Fisheries (MFish) is seeking your decision on sustainability measures and other management controls for kahawai stocks to apply from the 2010/11 fishing year beginning on 1 October 2010.

2 The following TAC, TACC and allowance options (in tonnes) are proposed for KAH 1:

Option	TAC	Customary allocation	Recreational allowance	Other sources of mortality	TACC
Option 1	2 000	200	900	40	860
Option 2	2 220	200	900	45	1 075
Option 3	2 885	200	900	60	1 725

3 All of these proposed options are consistent with your statutory obligations under the Fisheries Act 1996 (the Act) and the Hauraki Gulf Marine Park Act 2000 (the HGMPA).

4 As Minister, and after considering statutory obligations, you have discretion in determining the target biomass level for stocks (provided that it is at or above B_{MSY}) and hence the Total Allowable Catch (TAC) to achieve the target. You also have discretion on how to allocate the TAC among Maori customary fishing interests, recreational fishing interests, other sources of fishing-related mortality and the Total Allowable Commercial Catch (TACC).

5 The main characteristics of the options presented are:

- Option 1 seeks to increase the spawning stock biomass from current stock size (about 45% of the unfished stock size (B_0)) to about 60% B_0 by 2028. The key benefit from this option would be more kahawai in the water and, as a consequence, increased catch rates and increased benefit for non-commercial fishers. The key cost would be a 20% (215 tonne) reduction in commercial catch, which has and current annual port price value of $50,000 and export value of $230,000.

- Option 2 seeks to increase the spawning stock biomass from current stock size to about 52% B_0 by 2028. The key benefit from this option would be more kahawai in the water and, as a consequence, increased catch rates and increased benefit for non-commercial fishers, although to a lesser extent than under Option 1. There is no immediate cost to the commercial sector in terms of reduced catch but the sector may experience greater difficulty managing kahawai bycatch as stock size increases.

- Option 3 seeks to decrease spawning stock biomass to the biomass level that will produce the maximum sustainable yield (B_{MSY}) (ie, to 35% B_0) by 2028. The key benefit from this option would be increased commercial benefit from an increase in commercial allowable catch of 650 tonnes,. The key costs would be the likely reduction in catch rates which could adversely affect benefits to non-commercial fishers.

6 Option 1 most closely aligns with approaches supported by customary non-commercial and recreational fishing submitters as Option 1 delivers benefits to non-commercial fishers and recognises the importance of kahawai to their well being. In general, commercial stakeholders favoured Option 3 because it would maximise sustainable yield and therefore commercial benefits.

7 MFish considers that, based on available information and associated uncertainties, Option 2 best balances the need to provide for the utilisation of fisheries resources while ensuring sustainability because:

- There is a high level of uncertainty in the stock assessment information and in information on relative and net benefit; MFish therefore considers it appropriate to act cautiously when using this information to choose between options.

- Non-commercial fishers are already receiving increased benefit relative to the commercial sector from management of the stock above B_{MSY}. Stock assessment information indicates that, under option 2, the stock size will continue to increase in size slowly and therefore will likely increase non-commercial benefits incrementally over the medium-term. Available information on value suggests this may increase the overall benefit derived from the utilisation of KAH 1.

- Option 2 minimises short-term impacts on the commercial sector without undermining future management decisions to target a larger stock size than is proposed under Option 2;
- New stock assessment information and recreational harvest information is likely to become available in 2013 to inform TAC, TACC and allowance setting.

8 The following TAC, TACC and allowance options (in tonnes) are proposed for KAH 2, 3, 4, 8 and 10:

Option	TAC	Customary allocation	Recreational allowance	Other sources of mortality	TACC
KAH 2					
Option 1 (*status quo*)	1 530	185	610	30	705
Option 2	1 530	185	800	30	515
Option 3	1 725	185	800	35	705
KAH 3					
Option 1 (*status quo*)	935	115	390	20	410
Option 2	935	115	510	20	290
Option 2	1 075	115	510	22	410
KAH 4					
Option 1 (*status quo*)	14	1	4	0	9
KAH 8					
Option 1 (*status quo*)	1 040	115	385	20	520
Option 2	1 155	125	425	25	580
KAH 10					
Option 1 (*status quo*)	14	1	4	0	9

9 MFish considers all of the proposed options are consistent with your statutory obligations under the Fisheries Act 1996.

10 The status of these stocks in relation to B_{MSY} is not known and yield estimates are not available.

11 In general, non-commercial submitters expressed concern about the status of these stocks and sought reductions to TACs and TACCs to achieve larger biomass increases whereas commercial submitters considered the next stock assessment would likely confirm that these kahawai stocks were in a healthy state.

12 For KAH 2, 3, 4, 8, and 10, MFish recommends retaining the status quo TACs, allowances, and TACCs in order to achieve the current management objective of increasing biomass from 2004 and 2005 levels.

13 In respect of other management controls, MFish considered the need for other management controls on recreational fishing to constrain catches to the allowances. MFish's conclusion is that additional or amended controls will not be required for any stock until about 2014, at which time you should have updated assessment information to inform a review of kahawai stocks.

14 MFish also considered deemed values for kahawai stocks and recommends that you retain the existing deemed values.

Background

15 Kahawai (*Arripis trutta* and *Arripis xylabion*) were introduced into the Quota Management System (QMS) in 2004. Decisions on the management of kahawai stocks, particularly the KAH 1 stock, have been contentious, with legal challenges from both non-commercial and commercial fishers that have extended to the Supreme Court. Following the Supreme Court decision in May 2009, you requested a review of all kahawai stocks be undertaken in 2010.

Consultation

16 MFish released an Initial Position Paper (IPP) on sustainability measures and other management controls for all stocks of kahawai on 25 June 2010. The IPP was posted on the MFish website under the "consultations" section and tangata whenua and stakeholders were notified of the review. Supporting information documents, for example plenary reports, were also made available on the Kahawai Forum webpage. Tangata whenua and stakeholders were made aware of the availability of, and how to access, these documents. Written submissions were requested by 13 August 2010.

Submissions Received

17 MFish received 1065 submissions on the IPP from:

- Bowentown Boating and Sportfishing Club (BBSC)
- Bay of Islands Swordfish Club, Hokianga Accord, New Zealand Sport Fishing and option4 (Joint Submitters)
- Council of Outdoor Recreation Associations of New Zealand Inc (CORANZ)
- Environs Holdings Ltd on behalf of Te Uri o Hau Maori Trust Board (Environs)
- Kaikoura Boating Club
- Kiwi Party
- Marlborough Angling and Surfcasting Club Inc (MASC)
- Marlborough Recreational Fishers Association
- New Zealand Federation of Freshwater Anglers Inc (NZFFA)
- New Zealand Fishing Industry Guild (Guild)
- New Zealand Recreational Fishing Council (NZRFC)

- New Zealand Seafood Industry Council (SeaFIC)
- Ngati Kahungunu Iwi Inc (NKII)
- Pelco New Zealand Ltd (Pelco)
- Sanford Limited (Sanford)
- Tasman and Sounds Recreational Fishers' Association Inc (TASFISH)
- Tauranga Fish and Dive Club (TFDC)
- Te Kawanga o Kahungunu and some owners of Moeangiangi part 42N and the Paikea Fishing Club
- Te Ohu Kaimoana / Maori Fisheries Trust (TOKM)
- Zone 5 Clubs of the New Zealand Sport Fishing - collective submission on behalf of the Akitio Fishing Club, Hawkes Bay Sports Fishing Club, Gisborne Tatapouri Sports Fishing Club, Mahia Boating and Fishing Club, Ngawi Sports Fishing Club, Porangahau Fishing Club, Tangimoana Boating Club, Twin Harbours Fishing Club, Wairarapa Sports Fishing Club, Manganui-Manawatu Sea Fishing Club. (Zone 5 Clubs)
- The following 29 individuals: Adams M, Beaton T, Bukholt N, Bull S, Day N, Doubroff S, Harris T&P, Hartley B, Hodder S, Hume, L, MacLeod D N, Mathews B, McKendry R, McMillian R, Murray C, Nicholls A&B, Oliver B, Orman B, Orman T, Pietersma T, Railey S&W, Saunders P, Seymour T&E, Simpson S, Stonely M, Taylor, T, Veail S, Vellenoweth J, Wood P
- An additional 1,016 individual email submissions were received, via the New Zealand Sport Fishing Council and option4 websites, which encouraged fishers to comment on their fishing area, and to indicate a preferred management option. A breakdown of these submissions by the number of submissions received for each kahawai stock is provided in Table 1.

Table 1. Number of website submissions received by QMA reported fished

QMA	Number of emails received
KAH 1	748
KAH 2	87
KAH 3	49
KAH 4	2
KAH 8	129
NSS*	1

*NSS = No stock specified

18 Copies of all submissions are available in Appendix 1.

19 MFish has considered all of the submissions. This advice paper addresses, as far is possible, the key points from the submissions and the options now being presented reflect MFish's response to all of the information that it now has before it, particularly as a result of the consultation process.

Biological Characteristics of Kahawai

20 Two species of kahawai are present in New Zealand waters, kahawai (*Arripis trutta*) and northern kahawai (*Arripis xylabion*). Under the QMS, both species are managed together as a single stock within each quota management area (QMA).

21 Kahawai are pelagic schooling fish that are widely distributed around New Zealand (NZ). Northern kahawai occur in the northern part of the Exclusive Economic Zone (EEZ) and seasonally around Northland. Movement of kahawai around NZ is poorly understood, however regional differences in age structure and abundance are consistent with limited mixing between QMAs. Accordingly, any conclusions about the status of one stock should not be applied to any other stock.

22 Research data suggests kahawai grow rapidly, attaining a length of around 15 cm at the end of their first year, and maturing at 3–5 years and 35–40 cm, after which their growth rate slows. The maximum size recorded for kahawai is 79 cm (fork length) and the maximum age is 26 years. Northern kahawai grow bigger attaining a maximum length of about 94 cm.

23 Kahawai's biological characteristics make it a medium productivity species (with some low attributes) in terms of the MFish Harvest Strategy Guidelines[1] for categorising productivity levels in exploited fish species.

24 Hereafter, unless otherwise stated, the term kahawai, when used, refers collectively to *A. trutta* and *A. xylabion.*

Kahawai Fisheries

25 Kahawai stocks support important non-commercial customary Maori, recreational, and commercial fisheries:

i) Kahawai is a traditional food fish for Maori non-commercial customary fishers. Kahawai is identified as a taonga species in some areas and important for the practice of manaakitanga, or hospitality. Nets, baited hooks, and lures continue to be common fishing methods used by Maori customary fishers to harvest kahawai.

ii) Kahawai are sought after by recreational fishers who employ a range of shore and boat-based fishing methods to catch kahawai. Available research information indicates that kahawai is the third most preferred target species, but is often listed in the top two target species, by recreational fishers.[2] Set nets, baited hooks, trolled and cast lures continue to be common fishing methods used by recreational fishers to harvest kahawai. Kahawai has also become an increasingly popular target species for saltwater flyfishing.

[1] Operational Guidelines for New Zealand's Harvest Strategy Standard, Ministry of Fisheries – October 2008.
[2] Motivations and perceptions of seawater recreational fishers in New Zealand. Walshe, K, Ackroyd, J 2000.

iii) Commercial fishing for kahawai is long established. Historically, the commercial fishery used set nets and ring nets. In the mid 1970s, the establishment of a New Zealand domiciled coastal purse seine fleet led to a marked increase in commercial kahawai catch. Purse seine vessels now take the bulk of commercial catches (as target and as bycatch of targeting other pelagic species). Kahawai is still also targeted using set nets and ring nets and is taken as bycatch in commercial longline and trawl fisheries targeting other species.

26 The main fishing grounds for kahawai are in the North Island, in particular the waters of the Bay of Plenty in KAH 1.

TAC Setting for Kahawai Stocks

27 Total Allowable Catches (TACs) for kahawai stocks are set under s13 of the Fisheries Act 1996 (the Act). When setting or varying a TAC under s13, you are required to turn your mind to a range of matters.

Purpose

28 The purpose of the Act (s8) is to provide for the utilisation of fisheries resources while ensuring sustainability. In the context of the Act, utilisation means "conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic and cultural well being". Ensuring sustainability is defined as "maintaining 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".

29 Section 8 guides the exercise of your decision-making powers pursuant to the Act, including the setting or varying of TACs. All the TAC options proposed in this review provide for the utilisation of kahawai fish stocks while ensuring sustainability.

Total Allowable Catch

30 Section 13 of the Act specifies that you must maintain a fish stock at a target stock level at, or above, a level that can produce the maximum sustainable yield (MSY). The stock biomass level that can produce the MSY is termed B_{MSY}. MSY is defined, in relation to any fish stock, as being the greatest yield that can be achieved over time while maintaining the stock's productive capacity, and having regard to the population dynamics of the stock and any environmental factors that influence the stock.

31 You have the discretion to decide the appropriate target level for a stock's size, provided that it is at or above B_{MSY}. Some submitters have queried the ability to manage a stock above B_{MSY}. Our advice is that you can decide to set a TAC that allows a stock to move further above B_{MSY}, even when it is already at or above B_{MSY}, if you consider that this would best serve the statutory purpose of providing for utilisation whilst ensuring sustainability.

32 You can consider aspirations of the various fishing sectors in the context of utilisation when setting the TAC. In particular, in determining the way in which, and rate at which, a stock is altered to achieve a target stock level, you are required to have regard to such social, cultural, and economic factors as you consider relevant.

33 Target stock levels and social, cultural and economic factors are discussed in the context of each individual kahawai stock in later sections of this paper.

34 When setting a TAC under s13 you must have regard to the interdependence of stocks. Interdependence of stocks is where there is a direct trophic (ie, a stock is likely to be directly affected by the abundance of another stock) or symbiotic relationship between stocks.

35 Kahawai swim in schools of similar sized fish and often mix with those of other pelagic species. Kahawai circle and herd schools of prey when feeding and in doing so make available the prey species to other predatory species. Kahawai are also preyed upon by species such as marlin and tuna. Kahawai *(A. trutta)* availability as prey is a factor in the seasonal availability of these sought-after gamefish.

36 Several submissions from recreational interests expressed concerns about the effect any reduction in kahawai schools might have on interdependent stocks of predators such as marlin and tuna. Sanford submitted there is an absence of any substantive analysis in the IPP regarding interdependent stocks; accordingly, any reliance on interdependence of stocks to justify any preference for options is contrary to the information principles. MFish agrees there is insufficient information about the interdependencies between kahawai and other fish stocks to favour a particular option. When information is uncertain, a cautious approach may be the appropriate course of action.

Sustainability measures

37 When setting or varying a sustainability measure such as a TAC, you must take into account (a) any effects of fishing on any stock and the aquatic environment; (b) any existing controls under the Act that apply to the stock or area concerned; and, (c) the natural variability of the stock concerned. In this regard:

- MFish considers the proposed TAC options for kahawai stocks do not significantly affect any stock or the aquatic environment. Non-commercial fishing methods and the commercial purse-seine fishing method are not known to directly affect the aquatic environment adversely. Some kahawai are caught by bottom trawl methods, which do impact the benthic environment but most kahawai taken by bottom trawl are bycatch in other target fisheries, as the bottom trawl fleet does not generally target kahawai. Reporting of fish bycatch allows for monitoring of any stock taken when fishing for kahawai.
- Controls on fishing vary between QMAs. Existing controls are therefore discussed individually for each kahawai stock in later sections of this paper.
- Available information suggests kahawai are not characterised by a high degree of natural variability. In general, only fish stocks that have levels of biomass well below B_{MSY} are subject to greater risk of susceptibility to recruitment failure when subjected to unfavourable environmental conditions (such as climatic patterns, habitat modification, availability of prey or disease). All TAC options proposed seek to retain kahawai stock sizes at or above B_{MSY}.

38 You must also take into account (a) any conservation services or fisheries services; (b) any relevant fisheries plan approved under s11A; and (c) any decisions not to require conservation services or fisheries services. In this regard:

- MFish is not aware of any fisheries or conservation services - or any decisions not to require fisheries or conservation services - that would be affected by the TAC options proposed;
- At this time there is no relevant Fisheries Plan that has objectives that are relevant to TAC setting for kahawai stocks.

39 You must have regard to any provisions of the following that apply to the coastal marine area that you consider to be relevant: (a) any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991; (b) any management strategy or management plan under the Conservation Act 1987; and, (c) sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 (HGMPA). In this regard:

- MFish is not aware of any provisions in any policy statements, regional plans or draft regional plans developed under the Resource Management Act 1991 that are specifically relevant to TAC setting for kahawai stocks.
- MFish is not aware of anything in provisions of management strategies or plans for relevant Conservancies that are relevant to TAC setting for kahawai stocks.
- The Hauraki Gulf Marine Park lies within the KAH 1 stock boundaries and discussion about factors relevant to ss 7 and 8 of the HGMPA are discussed in the section on KAH 1.

Environmental principles

40 When making any decision under the Act, you must take into account the following environmental principles:

- associated or dependent species should be maintained above a level that ensures their long-term viability;
- biological diversity of the aquatic environment should be maintained; and
- habitat of particular significance for fisheries management should be protected.

41 Research suggests kahawai form important ecological relationships with some associated or dependent species, including with some seabirds, and possibly some marine mammals. There is conflicting information on whether kahawai fishing activities are detrimental or beneficial to the long-term viability of associated and dependent species, and benefit or detriment may in reality vary depending on the species. Robertson (1992) speculated reductions to the populations of species including kahawai might have allowed smaller pelagic species to increase in abundance, which may be contributing to the observed increase in the NZ gannet population during recent decades[3]. The Kaikoura Boating Club links a study showing the red-billed gull population in Kaikoura has declined 51% to the fishing down of the kahawai stock, which occurred over the same period, however this linkage is unverified.[4] International

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

[4] MFish notes the paper has not been provided to MFish (nor located by MFish at this time) and neither the paper nor the the linkage to kahawai fishing have not been subject to peer review by MFish science working groups.

research has concluded that only extreme food shortages cause significant adult bird mortality, but poor to moderate availability of food can reduce adult body weight, clutch size, breeding success, colony attendance and the growth rates of chicks[5]. Consequently, further information on the linkages between kahawai abundance and the abundance of associated and dependent species is required before a kahawai stock size that achieves the best outcomes for associated and dependent species can be identified.

42 Current information does not enable robust analysis of interactions between kahawai fishing and biological diversity (refer previous paragraph). Reporting of fish and protected species bycatch and observer surveys of protected species interactions allows for information to be collected to advance our knowledge of potential impacts.

43 No habitats of particular significance for fisheries management have been identified that would be affected by the TAC options proposed.

International obligations & Treaty of Waitangi

44 In setting or varying sustainability measures, you must act in a manner consistent with New Zealand's international obligations to fishing and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.

45 A wide range of international obligations relate to fishing, including use and sustainability of fish stocks and maintaining biodiversity. MFish considers that the proposed management options for all kahawai stocks are consistent with these international obligations.

46 MFish also considers that the proposed management options are consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.

Information principles

47 Section 10 of the Act requires you to take into account certain information principles, including that decisions should be based on the best available information, that any uncertainty in the available information should be considered, and caution should be applied when information is uncertain, unreliable, or inadequate, but the absence of, or uncertainty in, information should not be used as a reason for postponing or failing to set a TAC. The options presented in this paper are based upon the information principles as set out in s10. Uncertainties in the information are identified.

Setting of Non-Commercial Allowances and the TACC

48 Section 21 of the Act requires you to allow for:

a) Maori customary non-commercial fishing interests

b) recreational fishing interests

c) and other sources of fishing-related mortality

within the TAC when setting or varying the total allowable commercial catch (TACC).

[5] 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.

49 TACs should be fully allocated. The Act does not confer any priority for any interest over any other. The matter of how to allocate between sectors is ultimately up to your discretion.

50 When allowing for Maori customary non-commercial interests, you must take into account any mataitai reserves and any area closure or fishing method restriction made under s186A of the Act. When allowing for recreational interests, you must take into account any regulations made under s311 of the Act that prohibit or restrict fishing.

51 All the management options presented in this paper fully allocate the TAC. Allocation options and existing management controls, including mätaitai reserves, s186A restrictions and regulations under s311, are discussed individually for each kahawai stock in subsequent sections.

Review of KAH 1 Fishstock

Stock status information

52 The following information is available on the status of the KAH 1 fish stock:

- B_{MSY} for KAH 1 has been established using the MFish Harvest Strategy Standard Guidelines, which indicate the default analytical proxy for B_{MSY} for moderately productive species like kahawai should be no less than 35% of the unfished biomass (B_0). B_{MSY} for kahawai has therefore been set at 35% B_0.
- A stock assessment for KAH 1 was undertaken in 2007. The Fisheries Assessment Plenary[6] concluded it was likely that current spawning biomass of KAH 1 was above B_{MSY}, but could not be certain how far above B_{MSY}.
- MFish notes that the KAH 1 stock assessment was characterised by uncertainty as it lacked fishery-independent information on abundance, total annual catches were not well understood due to the considerable uncertainty in non-commercial catches, and information on some aspects of kahawai biology and behaviour is uncertain (eg, on natural mortality levels).
- The Northern Inshore Stock Assessment Working Group (NINSWG) concluded that it was unlikely that the KAH 1 stock would decline below B_{MSY} levels if the current level of removals is maintained.

53 To inform management options in this paper, MFish has used scenarios from the range evaluated in the stock assessment that include conservative, but reasonable, assumptions for natural mortality *M*, steepness of the stock-recruit relationship, *H,* and recreational catch. Based on the model parameterisation used, the assessment suggests that current biomass is about 45% B_0, and that biomass would change as discussed under the different TAC scenarios proposed. The assessment estimates of yield, current biomass and projected biomass levels are considered to be cautious given the uncertainties in the assessment. It should be noted, however, that alternative yield and biomass levels would be indicated by other scenarios from the assessment

[6] Report from the Fisheries Assessment Plenary, May 2007: stock assessments and yield estimates Compiled by Ministry of Fisheries Science Group May 2007. [The Plenary report provides annual updates of stock status and yield for all stocks as prepared by the relevant scientific fisheries assessment working groups.]

54 Some submitters expressed concern about the uncertainty in the stock assessment:

- Joint Submitters submitted that the assessment could be seriously flawed and should not be considered best available information. It noted that the experience and observations of hundreds of non-commercial fishers do not support that unfished biomass has only been reduced to about 50%. Those submitting through the option4 website were asked to compare the numbers of kahawai in their area currently to the number in the 1980s. About 37% indicated current stock size is half the size or larger than it was in the 1980s, and about 63% believe the stock size is less than half the size it was in the 1980s. Joint submitters also noted that the biological characteristics used in the stock assessment are for kahawai only and that the existence of northern kahawai is ignored;
- Some commercial submitters contended there was more evidence in support of a healthy stock. The Guild referred to increasing trends in commercial bycatch of kahawai as support for this view. Both Sanford and SeaFIC referred to a number of fishing magazine articles that suggest kahawai are plentiful and often found in large schools.

55 MFish considers the information on trends in fisher observations, commercial bycatch and CPUE trends, and magazine articles to be less reliable indicators of relative levels of biomass in KAH 1 than the stock assessment because:

- Fisher observations are vulnerable to cognitive biases, including: memory bias, which may either enhance or downgrade past situations; selectivity bias, whereby personal expectations may affect observations; and, outcome bias, where, if observations are collected in the context of future-focussed decision-making, the observations may be influenced by the outcome sought by the observer.
- Commercial bycatch trends and CPUE are affected by more than stock size; factors such as structure of the fishing fleet, weather and market demand for particular species can also affect these metrics.
- The content of recreational fishing magazines is influenced by the need to sell magazine subscriptions and advertising space. Accordingly, articles are written in a style that appeals to subscribers and to attract advertisers or sell their products. Further, articles tend to be written mostly by avid and experienced fishers with the skills necessary to ensure successful fishing trips.
- These anecdotal indications are somewhat contradictory and none, in isolation, is likely to be a good indicator of the status of the KAH 1 stock.

56 MFish acknowledges the KAH 1 stock assessment contains uncertainty. Stock assessment researchers and the MFish NINSWG investigated key uncertainties at the time of the assessment by using the alternative values for key parameters listed in Table 2 to examine sensitivity.[7]

Table 2. Axes of uncertainty and options chosen on grid.

Axis	Range
M (natural mortality)	0.12, 0.18, 0.24
H steepness of stock recruitment relationship	0.75, 1
Non-commercial catch	Constant 800, 1865t
Abundance indices	All, no set net, no recreational

57 The assessment results were largely insensitive to the abundance indices. The assumed steepness of the stock-recruitment relationship also had only a small influence on estimates of fishing mortality and yield. The assessment results were strongly influenced by the choice of value for natural mortality, *M*. The 2010 Plenary Report notes that the 0.12 and 0.24 are probably at the limit of plausible values for *M*. The model projections used a mid-range *M* of 0.18 and a stock recruitment steepness parameter, *H* of 0.75 at the recommendation of the MFish Chief Scientist. International studies recommend a *steepness* parameter of 0.73-0.76 when data for estimating the relationship between recruitment and spawner biomass are limited.

58 To address uncertainty in estimates of recreational catch, the stock assessment included an upper bound of 1865 tonnes and an arbitrary lower bound of 800 tonnes as constant recreational catch history. Assumed non-commercial catch history has little influence on the stock status predicted by the stock assessment. Assumed levels of removals do, however, influence the yield predicted by the assessment. At a meeting held 20 April 2010, the NINSWG considered new information on recreational catches and identified 800 tonnes as the most plausible recreational catch estimate used in the assessment.

59 In respect of northern kahawai, MFish acknowledges the 2007 stock assessment is based primarily on kahawai (*A. trutta*). *A. trutta* are predominant in commercial landings and, because of distributional characteristics, are likely also to be predominant in non-commercial landings.

60 Based on this analysis, MFish considers the best available information on stock status to inform TAC setting in KAH 1 at this time is the 2007 stock assessment, informed by information that has become available subsequently on recreational harvest levels.

Fishery information

KAH 1 Maori customary non-commercial fishery

61 Maori customary catch is that taken under r27A of the Fisheries (Amateur Fishing) Regulations 1986 (the Amateur Regulations) or under the Fisheries (Kaimoana Customary Fisheries) Regulations 1998 (the Kaimoana Regulations). A robust estimate of Maori customary catch currently taken in KAH 1 is not available at this time. Available records of customary catch taken under the Kaimoana Regulations provide the following quantities: 150 kg in 2005; 70 kg in 2006; 80 kg in 2007; 1021 kg in 2008; and, 974 kg in 2009.[8] These figures are likely to significantly underestimate customary

[7] *Assessment of the KAH 1 fishery for 2006* B Hartill New Zealand Fisheries Assessment Report 2009/24
[8] Some of these catches were reported in numbers of fish, and weights have been calculated assuming an

catch as reporting is only required in relation to customary permits granted under the Kaimoana Regulations. These regulations currently apply to approximately 15% of the coastline of KAH 1 and coverage does not include areas know to be popular for kahawai fishing such as the Motu river mouth. Customary fishing authorised by customary fishing permits issued under r27A of the Amateur Regulations is not reported. In addition, customary catch information in the areas is, at this time, uncertain due to variable reporting units, frequency and accuracy.

62 The 2007 stock assessment for KAH 1 did not incorporate an explicit catch history for customary catch, and modelled biomass projections and yield estimates do not consider the likely impact of customary harvesting in the past or in the future. In using the stock assessment outputs to inform this advice, MFish has assumed that the impact of Maori customary catches (and incidental fisheries-related mortality) has been relatively constant over time and so may be treated as an additional yield over and above any estimates generated from the stock assessment model. The allowance for Maori customary catch (and incidental fisheries-related mortality) has therefore been added to the yield generated by the model to determine the TAC. A consequence of this assumption is that any change to a proposed allowance for customary catch (and incidental fisheries-related mortality) is not available for allocation to the recreational allowance or the TACC.

63 Environs Holdings Ltd (submitting on behalf of Te Uri O Hau iwi) noted kahawai in KAH 1 is listed in their settlement as a 'taonga' (treasure) species and regarded with the highest importance. Joint Submitters stated that Maori have had an historic interest in kahawai and kahawai is an important food source in some localities, noting specifically "the Motu and other eastern Bay of Plenty river mouths, which for centuries had supported Nga Tai and Whanau-a-Apanui".

KAH 1 recreational fishery

64 Regional and national surveys are undertaken at irregular intervals to estimate recreational harvest of fish species as there is currently no requirement to report fish harvested under the Amateur Regulations. Recreational harvest estimates undertaken for KAH 1 are summarised in Table 3.

Table 3. Recreational harvest estimates for KAH 1.

Year	Estimate (t)	Range	CV (%)
Telephone/diary surveys			
1993-94	978	920-1035	-
1996	960	900-1020	6
2000	2195	916-2475	13
2001	2248	-	13
Aerial over-flight survey			
2004-05	530	-	9

average individual fish weight of 1 kg.

65 In 2006, the Pelagic Species Stock Assessment Working Group (PELWG) and the NINSWG considered the 2000 and 2001 recreational harvest estimates for KAH 1 to be possibly overestimated for those years and to be implausibly high if considered as a long-term average. The Groups considered the estimates were likely to represent the upper limit of the harvest that may have occurred in any year since the 1990s. The aerial over-flight estimate of 530 tonnes in 2004/05 was considered implausibly low as a long-term average.

66 The 2007 stock assessment used two estimates of recreation harvest: 800 tonnes and 1,865 tonnes. In 2010 the NINSWG reconsidered the harvest estimates used in the assessment after further work benchmarking the KAH 1 estimates against SNA 1 estimates was undertaken.[9] The NINSWG concluded the 800 tonnes estimate was more plausible than the 1865 tonnes estimate. It noted, however, that the 800 tonnes estimate might not be the best available estimate of the KAH 1 catch in 2004/05, given the aerial over-flight estimate of 530 tonnes for that year.

67 Submissions from recreational interests noted that the kahawai fisheries were valued as an important source of food, as an outdoor activity for families and as having potential for generating income from tourism-based fishing.

68 In 1999, MFish commissioned the South Australian Centre for Economic Studies (SACES) to look at non-commercial values associated with key recreational fisheries (including kahawai). SACES[10] assessed kahawai as the second most valuable of five key New Zealand recreational species.[11] The assessment used non-market estimation techniques (marginal willingness to pay (MWTP)) to indicate the social and economic benefits recreational fishers receive from the kahawai resource. The MWTP for kahawai was assessed at $3.50 per kg (adjusted for inflation to the 2010 value).

69 The methodology employed produced what remains the best available information on non-market values for the species covered by that survey. However, there is considerable uncertainty in this information arising from the assumptions used to generate the value measure. Also, the result represents a single point estimate of value at the time the study was undertaken (1999); values can change over time.

[9] Presentation to NINSWG April 20 2010, document # NINSWG-2010-18; Kahawai recreational harvest review by Bruce Hartill.

[10] Value of New Zealand Recreational Fishing REC9801 The South Australian Centre for Economic Studies 1999.

[11] MFish notes participation rates of recreational fishers as estimated by the 2000-01 telephone/diary survey reveals that KAH 1 was the second most targeted recreational stock in New Zealand, after snapper in SNA 1.

KAH 1 commercial fishery

70 Figure 2 shows the history of commercial landings of KAH 1 since 1979. A purse seine target kahawai fishery catch limit was introduced in 1989-90 and, after QMS introduction in October 2004, a TACC was set. These limits are shown in Figure 2 as a solid line. The initial TAC and TACC set in 2004 were reduced in 2005.

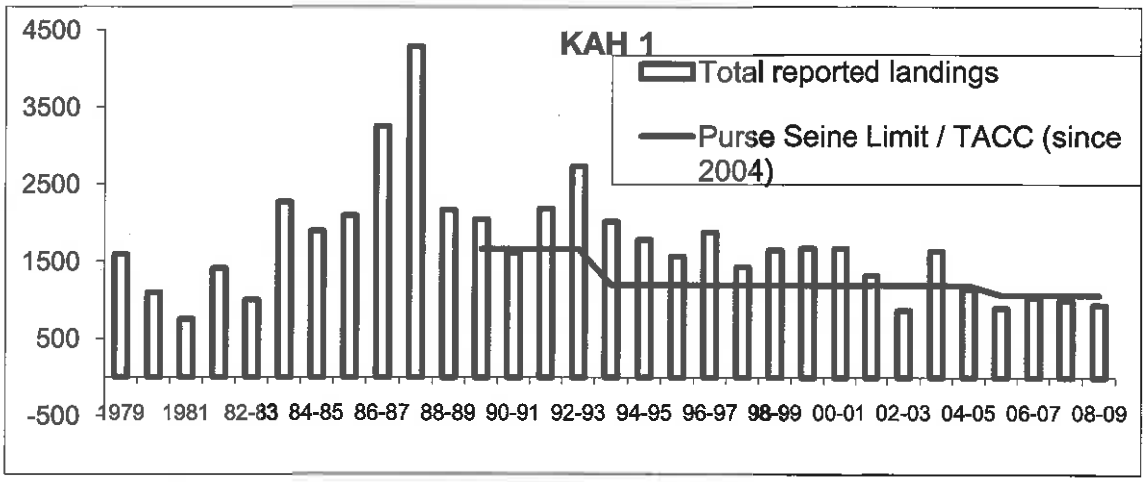


Figure 2. Total reported KAH 1 landings and catch limits

71 The kahawai purse seine fleet, which is based in Tauranga, preferentially targets skipjack tuna between December and May, with very little bycatch. When skipjack are not available (usually June through November) the fleet fishes for a mix of species including kahawai, jack mackerels, trevally and blue mackerel. These are caught 'on demand' as export orders are received to reduce product storage costs.[12]

72 Sanford and Pelco submitted that commercially-caught kahawai provides for people to obtain good quality seafood on a regular basis and at a reasonable price. Submitters noted that commercially-caught kahawai are sold into domestic and export markets, including into higher-value smoked fish markets, and also as bait in Australia.

73 Kahawai (all stocks) is the 36th most valuable QMS species to the commercial sector by quota value. Average quota value for the 2008-09 fishing year in KAH 1 was $2,930 per tonne. Average ACE value – the earnings quota owners receive when selling their ACE - for the 2008-09 fishing year in KAH 1 was $284 per tonne ($0.28 per kg). The port price (what fishers receive for their fish prior to costs being taken into account) for the 2008-09 fishing year in KAH 1 was $230 per tonne ($0.23 per kg). The 2009 average unit export value for kahawai was $1,070 per tonne.

[12] Report from the Fisheries Assessment Plenary, May 2010: stock assessments and yield estimates.

Management options for KAH 1

74 MFish proposes you consider the following options for KAH 1:

75 In short:

- **Option 1** reduces the TAC by 1,315 tonnes to 2,000 tonnes. The greatest portion of the decrease (1,100 tonnes) is the result of a technical adjustment (ie, does not result in any new constraints on catch) to non-commercial allowances to reflect new improved information on catch levels. The *effective change* that would result from choosing Option 1 would therefore be a reduction in allowable catch of approximately 215 tonnes. Option 1 achieves this reduction by reducing the TACC.
- **Option 2** reduces the TAC by 1,095 tonnes to 2,220 tonnes. The full amount of the decrease is the result of a technical adjustment to non-commercial allowances to reflect new improved information on catch levels. The *effective change* that would result from choosing Option 2 is therefore nil.
- **Option 3** reduces the TAC by 430 tonnes to 2,885 tonnes. The technical adjustment to non-commercial allowances to reflect new improved information on catch levels reduces non-commercial allowances by 1,080 tonnes. The *effective change* of choosing Option 3, therefore, would be an increase in allowable catch of approximately 650 tonnes. Option 3 allocates this increase in catch to the TACC.

Table 4. Proposed TAC, allowances and TACC options for KAH 1

Option	TAC	Customary allocation	Recreational allowance	Other sources of mortality	TACC
KAH 1					
Curent settings	3,315	495	1680	65	1,075
Option 1	2,000	200	900	40	860
Option 2	2,220	200	900	45	1,075
Option 3	2,885	200	900	60	1,725

KAH 1 TAC options

76 The TAC options are designed to achieve different stock target levels and are based on catch scenarios and biomass projections from the 2007 stock assessment. MFish considers the options provide a good representation of the range of options available to you when managing under s13 of the Act. You are free, however, to adopt an alternative TAC to those proposed.

77 No option to retain the current TAC is proposed. The current TAC was based on the best estimates of catch available at the time of QMS entry, including estimates of recreational catch now considered to be implausibly high as averages. The TACs now proposed incorporate new information on recreational catch estimates.

78 Option 2 is consistent with a 'status quo' option. Option 2 does not seek to change the current harvest levels of any sector group; it adjusts non-commercial allowances and the TAC only to reflect new information on recreational catch.

79 Sanford submitted that describing Option 2 as status quo was misleadingly because the option increased stock biomass over time. MFish notes the term 'status quo' is used only to refer to the fact that the change being made is technical in nature and would not result in any new constraints on catch for any sector.

80 Option 1 as conveyed in this paper is not the same as the Option 1 consulted on in the IPP, excepting in respect of the target stock level ($60\%B_0$). Option 1 in the IPP was unintentionally based on a yield curve estimate rather than model projections (which were used for Options 2 and 3), resulting in a TAC proposal that was inconsistent with the other two options and overly optimistic in terms of predicted yield.

81 MFish has revised Option 1 so that it is based on the model projections and therefore the same assumptions as the other options presented. The model projections indicate achieving the target stock level of $60\%B_0$ would require a TAC of 2,000 tonnes rather than the 2,190 tonnes proposed in the IPP.

Stock target level

82 All of the TAC options for KAH 1 ensure stock sustainability and are consistent with the s13 requirement to maintain a fish stock at a target stock level at, or above, B_{MSY}.

83 The 2007 stock assessment results suggest the current stock biomass level of KAH 1 is above the B_{MSY} of 35% B_0. the TAC options are designed to achieve different stock target levels and are based on estimates of yield from the stock assessment model parameterisation used for this analysis:

- **Option 1** would <u>increase</u> the spawning stock biomass further above B_{MSY} to approximately 60% B_0.
- **Option 2** would <u>increase</u> the spawning stock biomass further above B_{MSY} to approximately 52% B_0.
- **Option 3** would <u>decrease</u> spawning stock biomass to B_{MSY} (ie, to 35% B_o).

84 Figure 3 shows trajectories of biomass associated with the three proposed options as determined by the stock assessment model.

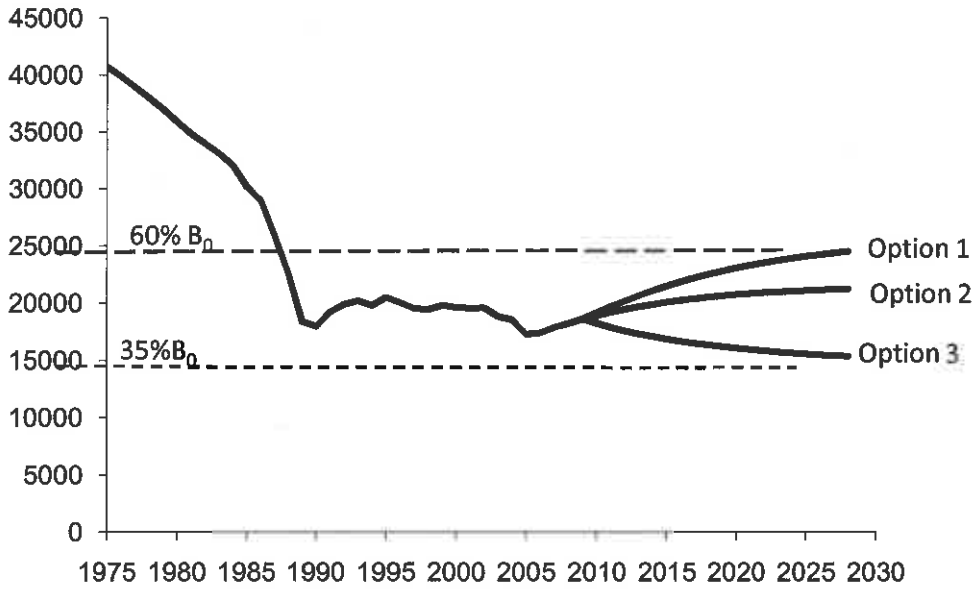


Figure 3. KAH 1 historical and projected biomass for the three TAC options based on the 800 tonne non-commercial catch history, an M of 0.18, and an H of 0.75. Vertical axis is spawning stock biomass (tonnes), horizontal axis is years.

85 There is no common view among submitters on a preferred target stock level:

- The NZRFC and TASFISH supported managing to the target stock level proposed by Option 1, noting that it was the best of the three options presented. The NZRFC requested a level of abundance be restored sufficient to allow amateur fishers to meet their social and economic needs and submitted that none of the options presented do that.
- Joint Submitters rejected a management target based on stock size relative to unfished biomass (B_0) because of uncertainty in stock parameters. They preferred an approach that set targets relative to existing conditions. Joint Submitters - and CORANZ, TASFISH, and Zone 5 Clubs – instead supported a TAC of 2,000 tonnes because this was more likely to lead to a target biomass that suited non-commercial fishing and environmental interests.
- Te Ohu Kaimoana, the Guild and two recreational submissions supported managing to the target stock size proposed by Option 2. The key reasons stated for supporting Option 2 was the need for better information to resolve uncertainties in the size of the recreational fishery. TOKM recommends the target stock size level be reassessed in terms of the MFish Harvest Strategy Standard once the large scale recreational harvest survey and new assessment have been completed.
- Sanford, SeaFIC and four individual recreational submitters supported Option 3. Sanford and SeaFIC considered that Option 3 was the only option consistent with the purpose of the Act (s 13) and the Harvest Strategy Standard.

- Pelco, while supporting Option 3, submitted a preference for moving the biomass to a level higher than 35% B_0. Pelco suggested 40% B_0 to provide greater certainty of maintaining the kahawai stock at B_{MSY}. Sanford also supported an alternative management strategy that manages the fishery at the current stock size (which is estimated to be 45% B_0).

Social, cultural and economic factors

86 The different target stock levels result in different social, cultural and economic outcomes. Social, cultural and economic costs and benefits of each option are outlined below:

- **Option 1** would increase stock biomass about 30% from the current level by 2028, but would require an immediate reduction in allowable catch of approximately 215 tonnes. The increased biomass would likely result in increased benefit to non-commercial fishers over the long term because the greater biomass is expected to support increased catch rates and result in kahawai being more available. Option 1 has an opportunity cost associated with foregone sustainable catch of about 865 tonnes, when compared with managing to B_{MSY} (Option 3). This foregone sustainable yield is most likely to represent an opportunity cost to the commercial sector, as commercial fishers have the fishing power to take greater yield if made available. Depending on allocation, the commercial sector may also have greater difficulty managing kahawai bycatch under this option due to increased catch rates.
- **Option 2** would increase biomass about 15% from the current level by 2028 while retaining the current yield. The increase in biomass provides for benefits to flow to non-commercial fishers, but not to the extent expected under Option 1. Option 2 is neutral in terms of immediate impacts on yield. However, an opportunity cost associated with foregone sustainable catch of about 650 tonnes, when compared with managing to B_{MSY}, remains. As with Option 1, this foregone sustainable yield is most likely to represent an opportunity cost to the commercial sector, as commercial fishers have the fishing power to take greater yield if made available. Depending on allocation, the commercial sector may also have greater difficulty managing kahawai bycatch under this option due to increased catch rates, but to a lesser extent than under Option 1.
- **Option 3** would decrease biomass about 20% from the current level by 2028 while increasing yield immediately and substantially. The decrease in biomass is likely to result in a decrease in benefit to recreational fishers because their catch rates and the availability of kahawai are expected to decline under this option. The increased yield compared to Option 1 or 2 would likely benefit the commercial sector the most because, depending on allocation decisions, as the commercial fishers have the fishing power to take the greater yield available, and this would enable revenue generation and assist with bycatch management.

87 Allocation decisions, as well as target stock level, have an impact on social, cultural and economic outcomes and therefore effects are discussed and compared further in the *Discussion of Options* section.

Way and rate of achieving the target stock level

88 All of the TAC options seek to achieve the associated target stock levels by 2028. The options are based on catch scenarios and biomass projections from the 2007 stock assessment.

89 You are free to adopt an alternative TAC to achieve a particular target stock level at a faster or slower rate or in stages. No stock assessment projections are available to indicate the effect of alternative TACs on the timeframe to achieve a target level, however, in general:

- For Option 1, a lower TAC to that proposed would result in the target stock level being achieved quicker and a higher TAC would achieve the target more slowly.
- For Option 2, a lower TAC to that proposed would result in the target stock level being achieved quicker and a higher TAC would achieve the target more slowly.
- For Option 3, a higher TAC to that proposed would result in the target stock level being achieved quicker and, if not then adjusted, in overfishing. A lower TAC would either result in the target not being achieved or being achieved more slowly.

90 In respect of the social, cultural and economic factors outlined above:

- The benefits associated with Option 1 (increased catch rates, fish sizes and potentially stock range) would occur incrementally and not be fully realised until 2028, but the cost (reductions in social, cultural and economic well being as a result of the reduction in catch) would occur immediately.
- The benefits and costs associated with Option 2 (increased catch rates, fish sizes and potentially stock range) would also occur incrementally and not be fully realised until 2028. There would be no immediate cultural, social or economic costs.
- The benefit associated with Option 3 (increased catch) would be realised immediately but the costs (decreased catch rates, fish sizes and potentially stock range) would occur incrementally and not be fully realised until 2028. Catch rates in some localised areas could decline soon after application of the proposed TAC, depending on the distribution of fishing effort.

Existing fishing controls

91 Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls for KAH 1 include the following:

- Kahawai is one of the species that is subject to the recreational fishing combined finfish daily bag limit of 20 fish in the Auckland and Kermadec Fishery Management Areas;
- A minimum net mesh size of 100 mm for set net and 85 mm for drag net applies in KAH 1 for both commercial and recreational fishers;
- Trawling is prohibited by regulation in large areas of the inshore zone within KAH 1. While these areas include prime habitat, kahawai are not actively targeted by trawlers;

- The recreational sector has previously identified conflicts between non-commercial fishing activities and commercial target fishing for kahawai, particularly by purse seiners and set netters. These concerns are currently mitigated by voluntary agreements[13] and by an outcome of a set net review undertaken in the early 1990s[14], which resulted in some areas within KAH 1 being closed to commercial set netting.

92 MFish does not consider that adopting any of the proposed options would affect the need for or effectiveness of, or require changes to, these existing controls.

Hauraki Gulf Marine Park

93 When setting or varying the TAC relating to stocks with boundaries intersecting with the Park, you are required to have regard to sections 7 and 8 of the HGMPA. Section 7 recognises the national significance of the Hauraki Gulf, including its capacity to provide for the relationship of tangata whenua and the social, economic, recreational and cultural well-being of people and communities. Section 8 sets out the objectives of the management of the Hauraki Gulf, which include the maintenance of the Gulf for social and economic well-being, and its contribution to the recreation and enjoyment, of the people and communities of the Gulf and New Zealand. MFish considers that all of the proposed TAC options provide for the above outcomes and are consistent with ss 7 and 8 of the HGMPA. As set out below, each TAC option has different costs and benefits for the respective sectors and therefore may shift the balance in terms of providing for social, economic, recreational, and cultural wellbeing as contemplated by the HGMPA.

Setting of non-commercial allowances and the TACC for KAH 1

94 Turning to the setting of non-commercial allowances and the TACC for KAH 1, MFish proposes the same non-commercial allowances across all three options, but different TACCs. You are, of course, free to adopt different allowances and TACCs to those proposed.

Allowance for Maori customary non-commercial interests

95 All options propose a Maori customary allowance of 200 tonnes for KAH 1.

96 Based on reported customary catch of KAH 1 in 2008 and 2009, Sanford submitted that a Maori customary allowance of ten tonnes would be more than sufficient for customary purposes. MFish acknowledges that extrapolating customary catch information from areas within KAH 1 requiring reporting of Maori customary catch to the whole of KAH 1 would provide an estimate in the range of five to ten tonnes.

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[13] There are voluntary purse seine closures for KAH 1 in place in Parengarenga Harbour, Rangaunu Bay, Doubtless Bay, Cavalli Island, The Bay of Islands, Rimariki Island to Bream Head, the inner Hauraki Gulf, the Bay of Plenty, Cape Runaway to East Cape. 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.

[14] An outcome of the set net review was that commercial set netting was prohibited by regulation (promulgated in 1993) from 26 locations.

97 However, the proportion of KAH 1 under the Kaimoana Regulations is small (~15%) and does not include areas known to be of high importance to Maori for kahawai harvesting such as such as the Motu River mouth in the Bay of Plenty]. In addition, customary catch information in the areas is, at this time, uncertain due to variable reporting units, frequency and accuracy. Due to the high level of uncertainty, it is proposed to take a cautious approach when adjusting the Maori customary non-commercial allowance. MFish notes taking a cautious approach to setting the Maori customary allowance does not affect the allowable catch available for allocation to other sectors. At this time, the impact of Maori customary catch (and also incidental fisheries-related mortality) is not included in the stock assessment and is assumed to have been relatively constant through time. The allowance is therefore added to the yield estimate generated by the stock assessment model to determine the TAC.

98 At the time of QMS introduction, MFish set the Maori customary allowance at 25% of the recreational allowance. MFish proposes retaining this proportionate allowance (to the nearest 100 tonnes) until better information is available on customary harvest levels. The proposed recreational allowance is 900 tonnes; therefore MFish proposes setting a customary allowance of 200 tonnes for all options.[15]

99 The current Maori customary allowance for KAH 1 is 495 tonnes. Although the proposed allowance of 200 tonnes is a reduction to the existing allowance, it does not reflect a change to current constraints on Maori customary fishing. Rather, it is a technical adjustment to the allowance to reflect information – and uncertainty in information - on customary harvest as described above.

100 Section 21(4) requires that any mataitai reserve or closures/restrictions under s 186A to facilitate customary Maori fishing be taken into account. There are two mātaitai reserves within KAH 1. One reserve at Mt Maunganui which includes part of the Tauranga Harbour, and one at Raukokere on the East Cape. Both these reserves are closed to commercial fishing but are not subject to any further restrictions specific to kahawai. The two additional s.186a closures in place at Umupuia and Ohiwa Harbour relate to cockles and mussels respectively and do not have any implications for your decision.

Allowance for recreational interests

101 All options propose a recreational allowance of 900 tonnes for KAH 1.

102 Sanford and Pelco both submitted the allowance should be set at a level lower than proposed, suggesting 500 tonnes and 800 tonnes respectively.

103 The NINSWG concluded that the 800 tonne recreational harvest estimate used in the assessment was more plausible than the 1,865 tonne estimate also used. However, the NINSWG noted that 800 tonnes may not be the best available estimate of the KAH 1 catch in 2004/05, given the aerial over-flight estimate of 530 tonnes for that year.

104 The NINSWG noted that using the relative proportions of KAH 1 to SNA 1 catch from the telephone/diary surveys (the proportions are considered reliable) and the estimate of SNA 1 recreational catch from the aerial over-flight survey of 2004-05 (considered reliable) produced an estimate of recreational catch of 892 tonnes in 2004-05.16

[15] 25% of 900 tonnes is 225 tonnes, which, rounded to the nearest hundred is 200 tonnes.
[16] *Assessment of the KAH 1 fishery for 2006* B Hartill New Zealand Fisheries Assessment Report 2009/24

105 MFish considers it appropriate to set the allowance at the level of this latter estimate (rounded to the nearest 100 tonnes) because:

- there is substantial uncertainty about estimates;
- the 892 tonne estimate is derived from proportions and estimates considered reliable;
- the 530 tonne estimate is likely to be low because kahawai is a popular target and catch of shore based fishers and aerial over flight methods do not capture shore-based harvest well.

106 Joint Submitters considered the allowance should be set at a higher level of 1,200 tonnes. Joint Submitters considered 1,200 tonnes to be sufficient to enable people to provide for their social wellbeing and not be based on current catch levels in a depleted fishery. MFish considers that an allowance of 900 tonnes provides for the social, economic and cultural well being of recreational fishers without going beyond what currently might reasonably be expected to be caught.

107 The current recreational allowance for KAH 1 is 1,680 tonnes. The proposed allowance of 900 tonnes is therefore a decrease. Although the proposed allowance is a reduction to the existing allowance, it does not reflect a change to current constraints on recreational fishing. Rather, it is a technical adjustment to the allowance to reflect the best estimate of the actual recreational harvest as described above.

Allowance for other sources of fishing-related mortality

108 MFish proposes retaining an arbitrary 2% of the combined non-commercial allowances and TACC as a basis for providing an allowance for all other sources of fishing relating mortality. No submissions were received on this topic.

Total Allowable Commercial Catch (TACC)

109 Proposed TACCs for KAH 1 are set out in Table 4. The different TACC options are a consequence of varying the TAC and only one TACC option is proposed for each TAC option.

110 Joint Submitters, CORANZ and many individual submissions considered that further reductions to commercial catch were required to increase the kahawai stock size, submitting that the TACC should be reduced to the level of the commercial bycatch. The basis for the request was the higher economic value of recreationally caught kahawai in comparison to commercially caught kahawai.

111 Commercial landings separated into the components of target and bycatch are provided in Figure 4. Reported levels of bycatch are variable from year to year and no trends are apparent from these data, which would make setting a TACC to cover bycatch only difficult. The result of a larger stock size on bycatch levels, and the ability of fishers to avoid kahawai, is unknown. Commercial submitters indicated managing bycatch of kahawai within ACE made available for that purpose was difficult was already difficult and any reductions to the TACC would make it more so.

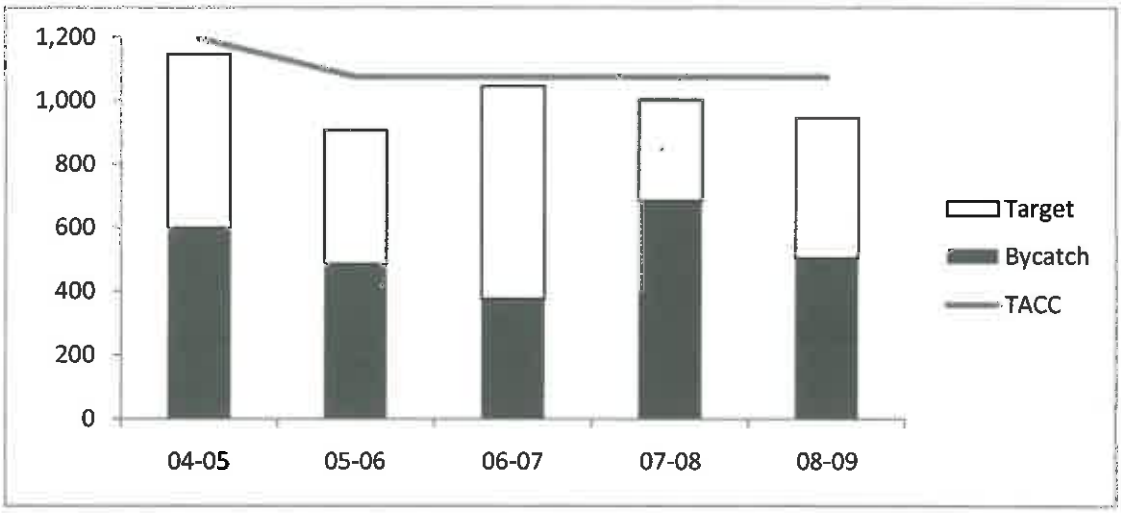

Figure 4. KAH 1 commercial landings separated into reported target and bycatch. Total landings are MHR data. Target landings were estimated by linking through the trip code, catch landing data (CLD), target species and prorating to CLD totals.

112 The options for varying TACCs in KAH 1 will have varying economic effects on the commercial sector. MFish has used the following indicators to estimate potential effects:

a) Port price: The port price reflects what fishers receive for their fish prior to costs being taken into account. The 2008-09 average port price was $230 per tonne for KAH 1.

b) Annual Catch Entitlement (ACE) price: The ACE value estimates the forgone annual earnings for quota owners associated with selling ACE. Average ACE for the 2008-09 fishing year in KAH 1 was $284 per tonne.

c) Export Earnings (assumes all catch would be exported): An important source of earnings from the kahawai fishery is derived from exports. The principal market is Australia (in the form of frozen whole fish). The 2009 average unit export price was $1,070 per tonne.

113 The assessment of the potential economic effects to the commercial sector associated with TACC options is summarised in Table 5.

Table 5: Potential immediate annual costs or benefits associated with changes to TACCs (based on port, ACE, and export prices above).

KAH 1	Option 1	Option 2	Option 3
TACC	860	1,075	1,725
Change from status quo	-215 tonnes	0	650 tonnes
Port price (NZ$)	-$49,450	0	$149,500
ACE price (NZ$)	-$61,060	0	$184,600
Export price (NZ$)	-$230,050	0	$695,500

114 Commercial fishers also derive benefit from the kahawai fishery that is not directly related to the value of the fish caught. The kahawai fishery allows fishing vessels to continue operating throughout the year, particularly when key target species are not in season. This means the costs associated with not fishing are avoided – these costs include berthing, and laying off and rehiring crew. These costs are not included in Table 4. MFish has no ability to assess such costs without gathering further information from operators. No such information was provided in submissions.

115 Sanford and SeaFIC stated that coastal purse seine fishing fundamentally depends on kahawai catches and any further catch reductions may jeopardise coastal pelagic fishing operations, including other purse seine target species such as blue (English) mackerel, jack mackerels and trevally. Sanford also considers that managing kahawai bycatch is a challenge at current TACCs when fishing for mixed species schools.

116 Table 6 below provides estimated purse seine catch from KAH 1 for the major species of jack mackerel (JMA), skipjack tuna (SKJ), trevally (TRE), English makerel (EMA), and kahawai (KAH) in 2007-08 and 2008-09.17 In both years, kahawai contributes less than 5% of the total purse seine catch and less than 4% of its value (based on port price).

Table 6. Purse seine catch in KAH 1 by species (tonnes)

	Species	JMA	SKJ	TRE	EMA	KAH
2008	Catch (tonnes)	10167	7065	125	4456	530
	% of total* purse seine catch	45%	32%	1%	20%	2%
	Port Price ($ per kg)	0.16	0.68	1.69	0.36	0.23
	% of total* purse seine value	19%	57%	3%	19%	2%
2009	Catch (tonnes)	9262	2774	285	1799	519
	% of total* purse seine catch	63%	19%	2%	12%	4%
	Port Price ($)	0.16	0.68	1.69	0.36	0.23
	% of total* purse seine value	32%	41%	10%	14%	3%

* Total as represented by the species included in the table – ie, JMA, SKJ, TRE, EMA and KAH.

Discussion of KAH 1 options

117 As previously noted, you have wide discretion, bounded by the specific provisions in the Act, as to the factors you consider in determining a management target for a fish stock and allocation of a TAC. MFish considers relevant factors include consideration of the costs and benefits to each sector associated with the options, the relative benefit of kahawai between sectors, and the net overall social, cultural and economic effect of the options. MFish notes that, when determining the weight to give information on relevant factors when making your decision, you should consider the uncertainty in the information.

[17] Calculated using estimated catch for statistical areas 1 to 9.

118 Table 7 indicates the changes associated with each proposed option in terms of yield, biomass and TAC, and the effects of the options for each sector.

119 Option 1 would increase overall biomass about 30% from current levels by 2028, but would require an immediate reduction in allowable catch of 215 tonnes. The increased biomass would likely result in increased benefit for non-commercial fishers (Maori customary and recreational) in the medium-term (10-20 years) because the higher biomass is expected to support increased catch rates and result in kahawai being more available to non-commercial fishers. This option would result in a reduction in benefit for the commercial sector through an immediate reduction to the TACC, a consequential reduction in revenue from the fishery, and possible associated effects on employment, vessel management, and processing capacity. Industry would also be likely to have greater difficulty managing kahawai bycatch under this option. Possible annual costs to the commercial sector are shown in Table 5.

120 MFish notes that commercial sector catches have been reduced previously, by about 450 tonnes in 2004 (on introduction into the QMS) and by 120 tonnes in 2005, to support stock biomass increases in KAH 1.

Table 7. Relative benefits of proposed TAC options

Option	Target biomass (%B_0)	Biomass (change from current by 2028)	TAC (tonnes)	Yield	Stock characteristics by 2028	Effects on non-commercial sectors	Effects on commercial sector
Option 1	~60% B_0	+30%	2000	Reduced ~215 t	Highest biomass; possible range expansion	Higher catch rates in time & associated increase in well being; fish more available and available in more places	Reduced catch & associated economic returns; likely difficulty managing bycatch
Option 2	~52% B_0	+15%	2220	Same	Increased biomass; possible range expansion	Higher catch rates in time & associated increase in well being; fish more available and potentially available in more places	Potential future difficulty managing bycatch
Option 3	~35% B_0	-20%	2885	Increased ~ 650 t	Decreased biomass; possible range contraction	Catch and catch rates likely to decline over time with associated decrease in well being	Higher catches & associated increased economic returns

121 Option 2 would increase biomass about 15% from the current level by 2028 while retaining the current yield. The increased biomass would likely result in increased benefit for non-commercial fishers in the medium term because their catch rates and the availability of kahawai are expected to increase under this option, but not to the extent expected under Option 1. Option 2 is neutral in terms of immediate impacts on the commercial sector as no change is proposed to the current allowable catch. As biomass increases, the commercial sector benefit may decline because of increased difficulty managing kahawai bycatch.

122 Option 3 would decrease biomass about 20% from the current level by 2028 while increasing yield substantially. The decrease in biomass would likely result in a decrease in benefit to recreational fishers because their catch rates and the availability of kahawai are expected to decline under this option. This option would result in immediate increases in commercial sector benefit through an increase to the TACC, a consequential increase in revenue from the fishery, and possible associated effects on employment, vessel management, and processing capacity.

123 Where there is information available that indicates substantial differences in value of a fishery between sectors, you could choose to determine which sector(s) value the fishery the most and enable that sector to maximise benefit from utilisation, thereby maximising overall benefit from harvest of the stock overall. Such an approach is consistent with the desired strategy for fisheries management outlined in Fisheries 2030. The policy preference expressed in Fisheries 2030 is to have "New Zealanders maximising benefits from the use of fisheries within environmental limits". Supporting this strategy is the outcome – "Fisheries resources are used in a manner that provides the greatest overall economic, social, and cultural benefit".

124 Quantitative value comparison between sectors is difficult and uncertain. Valuation of the commercial sector is relatively straight forward. Quota and ACE can be freely traded and as such generate market values which can be used to form part of an assessment of commercial value of a fishery. Non-commercial rights are not defined to the same degree and not transferable. There is no market valuation and no direct way to compare values. However, there are a number of techniques available to ascribe value in the absence of a market. These techniques are well tested internationally. But there remains debate about their accuracy and the ability to compare with market values.

125 MFish notes the SACES study indicates there is marked difference in the value of kahawai between sectors, with the fishery being more valuable to the recreational sector. MFish considers that, despite the acknowledged uncertainty in available information about the value of the kahawai fishery, the methodology employed produced what remains the best available information on non-market values for kahawai.

126 In 2010 Economic Research Associates (ERA) were commissioned to apply a simple bio-economic model using KAH 1 as a case study.[18] The model simulated how the overall fishery value is affected by key variables, in particular the way the non-commercial catch rate varies with increasing stock biomass, the relative value of commercial and non-commercial catch and the way the non-commercial value varies with increasing stock biomass. Subject to sustainability constraints, the model sought to identify the circumstances where overall value from the fishery was maximised.

[18] Cutting the Cake in a Shared Fishery with a Minimally Managed Non Commercial Sector Report for the NZ Ministry of Fisheries April 2010, Economic Research Associates.

127 For the case where the unit value of non-commercial catch is held constant, scenarios close to increasing the stock size to 60%B_0 (ie, Option 1) yielded the greatest combined value of commercial and non-commercial catch and is preferred when the non-commercial value is based on the SACEs valuations. When the unit value of non-commercial catch is reduced by an order of magnitude from the SACEs value, management at MSY (Option 3) is preferred. MFish notes there is considerable uncertainty in this information, including:

a) the results are driven by the relative values of the non-commercial catch (which is uncertain) compared to commercial catch (valued by ACE)

b) the model is simplistic in its assumptions, including in taking account of how marginal values change with stock size

c) the assumption that recreational catch rate is a linear function of stock size

d) fishery data used in the analysis is over 10 years old.

128 You may decide that managing the fishery above B_{MSY} to benefit the recreational sector will increase the overall benefit from utilisation of the KAH 1 fishery. MFish recommends caution if applying this approach however, as the uncertainty in the available information on relative values and net benefit is considerable.

129 Submissions from both commercial and recreational interests were not supportive of a value-based management approach because of the high level of uncertainty in information and implications for management of existing shares within TACs.

130 Sanford does not believe that the concept of "maximising benefit" is consistent with the purpose statement of the Fisheries Act. MFish considers that the concept of maximising benefit is consistent with the purpose of the Fisheries Act. Under the Act, 'utilisation' is defined as 'conserving, using or enhancing, and developing fisheries resources to enable people to provide for their social and cultural wellbeing'. While the Act does not use the word maximise, it is within your discretion to choose to maximise wellbeing (or benefits) on a case by case basis. In general, MFish considers it is logical and consistent with our strategic direction to create management framework(s) that enable people to maximise their wellbeing from use of fisheries resources within the bounds of ensuring sustainability. Aiming to maximise benefit from utilisation of a resource ensures that the portion of the resource that is harvested is put to the best/most efficient use. Whether or not this approach is appropriate will depend on the specific characteristics of the fishery.

131 Sanford also submitted that proposals to manage KAH 1 substantially above BMSY represent a reallocation of the resource from the commercial to recreational sector and would irreparably damage the integrity of the QMS. MFish notes the Act provides you with discretion to manage at a level at or above B_{MSY} and to allocate the TAC, and that this does not amount to reallocation; you are simply exercising your right under the Act to put in place the most appropriate sustainability measure that you believe is required in the circumstances. In this instance, all of the options canvassed in this paper fit within what can be achieved under the Act, including ss 13 and 21.

132 MFish notes that certainty for the commercial sector is important and helps create the incentives inherent in the rights-based management system. From a policy perspective decisions that could affect that certainty, including TAC and allocation decisions, would be best made within a policy framework that provides stakeholders advance knowledge of the circumstances in which the government would make such decisions. This policy perspective does not fetter your discretion, however.

133 Overall the option that you choose will depend on your desired outcomes for the fishery. MFish considers that, based on available information and associated uncertainties, Option 2 best balances the need to provide for the utilisation of fisheries resources while ensuring sustainability because:

- There is a high level of uncertainty in the current stock assessment information and in current information on non-market values; MFish therefore considers it appropriate to act cautiously when using this information to choose between options.
- Non-commercial fishers are already receiving increased benefit relative to the commercial sector from management of the stock above B_{MSY}. Stock assessment information indicates that, under option 2, the stock size will continue to increase in size slowly and therefore will likely increase non-commercial benefits incrementally over the medium-term. Available information on value suggests this may increase the overall benefit derived from the utilisation of KAH 1.
- Option 2 minimises short-term impacts on the commercial sector without undermining future management decisions to target a larger stock size than is proposed under Option 2;
- New stock assessment information and recreational harvest information is likely to become available in 2013 to inform TAC, TACC and allowance setting.

Review of KAH 2 Fishstock

Stock status information

134 The 2010 Plenary Report states the following about stock status for KAH 2:

- the status of KAH 2 relative to B_{MSY} is unknown; and
- it is not known if the current catches, allowances or TACCs are sustainable.

135 Some submitters submitted anecdotal information on stock status:

- People submitting through the option4 website were asked to compare the numbers of kahawai in their area currently to the number in the 1980s. For KAH 2, 41% indicated current stock size is half the size or larger than it was in the 1980s, and 59% believe the stock size is less than half the size it was in the 1980s.
- W.T. Taylor submitted that kahawai are the main source of food during spring and summer for locals in the area of the Wairoa Hard in Hawkes Bay, and that this area has experienced a dramatic decline in numbers of the last twenty years.

- Some commercial submitters contended there was evidence in support of a healthy stock. The Guild referred to increasing trends in commercial bycatch of kahawai as support for this view. Both Sanford and SeaFIC referred to a number of fishing magazine articles that suggest kahawai are plentiful and often found in large schools.

136 The information provided by submitters is somewhat contradictory and, as previously noted, trends in fisher observations, commercial bycatch and CPUE trends, and magazine articles are not, on their own, considered to be reliable indicators of relative levels of biomass (refer para 55).

Fishery information

KAH 2 Maori customary non-commercial fishery

137 A robust estimate of Maori customary catch currently taken in KAH 2 is not available at this time. Available records of customary catch taken under the Kaimoana Regulations provide the following quantities: 0 kg in 2005; 25 kg in 2006; 200 kg in 2007; 15 kg in 2008; and, 35 kg in 2009.[19] These figures are likely to underestimate customary catch as many iwi and hapu in KAH 2 still issue customary fishing permits under r27A of the Amateur Regulations, which does not require reporting of customary permits issued or catch taken. In addition, customary catch information reported under the Kaimoana Regulations is, at this time, uncertain due to variable reporting units, frequency and accuracy.

KAH 2 recreational fishery

138 Recreational harvest surveys undertaken for KAH 2 are summarised in Table 3.

Table 8. Recreational harvest estimates for KAH 2.

Year	Estimate (t)	Range	CV (%)
Telephone/diary survey			
1992-93	298	245-350	-
1996	217	190-240	9
2000	2,937	769-5,105	74
2001	799		20

KAH 2 commercial fishery

139 Figure 5 shows the history of commercial landings of KAH 2 since 1979. A purse seine target kahawai fishery catch limit was introduced in 1989-90 and, after QMS introduction in October 2004, a TACC was set. These limits are shown in Figure 5 as a solid line. The initial TAC and TACC set in 2004 were reduced in 2005.

140 Landings of kahawai reported from KAH 2 are predominately taken when purse seine target fishing for kahawai.

[19] Some of these catches were reported in numbers of fish, and weights have been calculated assuming an average individual fish weight of 1 kg.

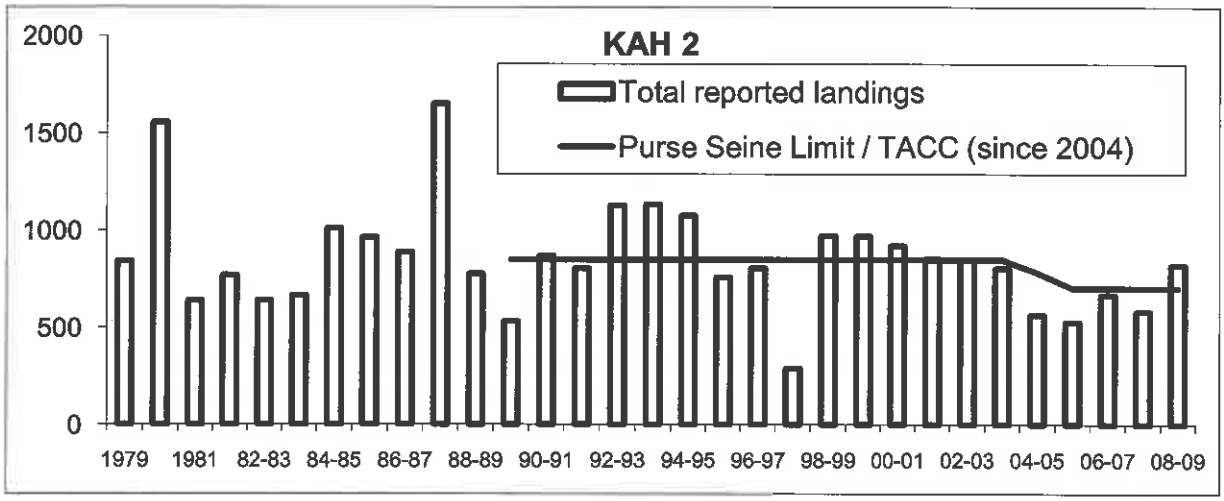

Figure 5: Historical landings, Purse seine catch limits and TACC (tonnes) for KAH 2.

Management options for KAH 2

141 MFish proposes you consider the following options for KAH 2:

Table 9. Proposed TAC, Allowance and TACC options for KAH 2 (tonnes).

KAH 2 Options	TAC	Customary Allowance	Recreational Allowance	Fishing related mortality	TACC
Option 1 (Status quo)	1,530	185	610	30	705
Option 2	1,530	185	800	30	515
Option 3	1,725	185	800	35	705

142 In short:

- **Option 1** - retains the existing TAC, allowances and TACC for KAH 2;
- **Option 2** – retains the existing TAC, increases the recreational allowance to reflect best available survey information on recreational catch and reduces the TACC a commensurate amount; and
- **Option 3** - increases the TAC to 1,725 tonnes to reflect a change to the recreational allowance based on the most recent (2001) recreational harvest estimate.

143 Option 3 is new and was not included in the IPP.

KAH 2 TAC options

144 In regard to TAC setting, MFish proposes either:

- retaining the existing TAC for KAH 2 **(Options 1 & 2)**; or
- increasing the TAC to 1,725 tonnes to reflect a change to the recreational allowance based on the best available recreational harvest estimate **(Option 3)**.

145 Current stock size is unknown for KAH 2 and no target stock level has been specified for the stock. When kahawai was introduced into the QMS in 2004, the KAH 2 TAC was set using averaged commercial landings from the period 1998-2003, and estimates of recreational and Maori customary catch based on recreational harvest survey information. The TAC, TACC and allowances decisions reflected decisions already made for the fishery (principally purse seine catch limits) and each sector's reliance on the kahawai fishery at that time, but included reductions in catch (excepting Customary Maori) of 15% to ensure the biomass was maintained and, preferably, increased. KAH 2 was reviewed in 2005, and the TAC, allowances and TACC were reduced by 10% to provide greater certainty that the biomass would increase. The reduction to the recreational allowance was not accompanied by a tool to further constrain recreational catches, as catches were considered to be within the new allowance set.

146 MFish notes that, although the KAH 2 stock status is unknown, the management objective of growing stock size is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, B_{MSY}.

147 Joint Submitters and 84 of the email submissions supported an alternative TAC of 1,340 tonnes. They submitted that further reductions to commercial catch are required for rebuilding the KAH 2 fishery, and based the alternative TAC on reducing commercial catch to bycatch levels only. Other submissions on KAH 2 supported retaining the existing TAC of 1,530 tonnes. MFish notes there is insufficient information to support a need for a further TAC reduction at this time. A national stock assessment for kahawai is expected to be completed in 2013 and should provide new information for reviewing the KAH 2 catch limits. MFish notes also that management at the level of commercial bycatch would involve a significant reduction to the TACC based on limited and highly uncertain information on stock status and relative stock values.

148 MFish notes that despite being larger, the TAC under Option 3 would not result in a slower rebuild to the stock. The TAC proposed under Option 3 reflects a technical adjustment to the recreational allowance only.

149 Only Option 2 would have an immediate impact on social, cultural and economic factors through the proposed reduction in commercial catch. MFish notes that if stock size increases as sought under all options, non-commercial fishers may incrementally receive benefits from increasing catch rates and availability of kahawai and commercial fishers may experience incremental costs from increased difficulty managing bycatch.

150 Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls for KAH 2 include the following:

- Kahawai is one of the species that is subject to the recreational fishing combined finfish daily bag limit of 20 fish in the Central Fishery Management Areas;
- A minimum net mesh size of 100 mm for set net and 85 mm for drag net applies in KAH 2 for both commercial and non-commercial fishers;
- Trawling is prohibited by fisheries regulation in some areas of the inshore zone within KAH 2. While these areas include prime habitat, kahawai being fast and powerful swimmers are able to avoid trawl nets and therefore are not actively targeted by trawlers;

- The recreational sector has previously identified conflicts between non-commercial fishing activities and commercial target fishing for kahawai, particularly by purse seiners and set netters. These concerns are currently mitigated by voluntary agreements.

151 MFish does not consider that adopting any of the proposed options would affect the need for or effectiveness of, or require changes to, these existing controls.

Setting of non-commercial allowances and the TACC for KAH 2

152 Turning to the setting of non-commercial allowances and the TACC for KAH 8, MFish proposes the same Maori customary allowance, but different options for allowances for recreational and other sources of mortality and TACCs. You are, however, free to adopt different allowances and TACCs to those proposed.

Allowance for Maori customary non-commercial interests

153 MFish proposes retaining the existing Maori customary allowance of 185 tonnes for KAH 2.

154 Sanford submitted that a Maori customary allowance of 10 tonnes would be more than sufficient for customary purposes. Information on customary catch is, at this time, highly uncertain due to non-reporting in some areas and variable reporting frequency and accuracy in others. Due to the high level of uncertainty, it is proposed to apply caution when considering adjusting the Maori customary non-commercial allowance. MFish notes any change to the allowance, if made, would represent a technical adjustment to reflect new information on customary harvest levels and would not make any additional catch available for allocation to other sectors.

155 NKII submitted that kahawai is an iconic taonga species to tāngata whenua in Kahungunu and an important source of food. NKII interpreted the Maori customary allowance allocation as a right to a share or proportion of the resource, rather than an indication of current use and submitted that customary demand could exceed the current allowance of 185 tonnes if the capacity and capability to use the resource was more readily available to tangata whenua. NKII recommended an increase in the Maori customary allowance to 280 tonnes to support tāngata whenua to manage the fishery sustainably by managing or shelving their share of the allocation accordingly and noted its intent to undertake further work to determine the actual needs of tangata whenua. MFish proposes retaining this existing allowance until better information is available on customary harvest levels.

156 Section 21(4) requires that any mataitai reserve or closures/restrictions under s 186A to facilitate customary Maori fishing be taken into account. There are 3 mātaitai reserves within KAH 2 boundaries. These are the Moremore Marine Reserves (a) and (b), Napier; and the Raukokere Marine Reserve, East Cape. MFish notes these reserves are small and do not have implications for your decisions.

Allowance for recreational interests

157 Option 1 proposes retaining the status quo recreational allowance of 610 tonnes for KAH 2 and reflects a cautious approach to change given the absence of recent, new information about the level of recreational harvest. MFish notes that catches were considered to be within this allowance when it was set in 2005.

158 Options 2 and 3 propose a higher recreational allowance of 800 tonnes based on the single point estimate of recreational catch from the 2001 survey, which was 799 tonnes. The 2001 survey constitutes the best available information on recreational harvest levels in KAH 2. However, the Recreational Technical Working Group recommends that harvest estimates from all the diary surveys should be used only with the following qualifications: a) they may be very inaccurate; b) the 1996 and earlier surveys contain a methodological error; and, c) the 2000 and 2001 harvest estimates are implausibly high for many important fisheries. In respect of KAH 2, the Plenary notes that recreational catch varies from year to year, and the 2000 recreational harvest estimate is implausibly high

159 Sanford submits that the 2001 estimate is implausibly high. MFish notes that new information on recreational harvest in likely to become available in 2012-13 as a result of a large-scale multi-species recreational marine fishing survey (LSMS) due to start in 2011.

160 MFish recommends retaining the status quo recreational allowance (Option 1). Information is highly uncertain and therefore MFish considers a cautious approach to adjusting the allowance is warranted.

Allowance for other sources of fishing-related mortality

161 MFish proposes retaining an arbitrary 2% of the TAC as a basis for providing an allowance for all other sources of fishing relating mortality. No submissions were received on this topic.

Total Allowable Commercial Catch (TACC)

162 Options 1 and 3 propose retaining the existing TACC. Option 2 proposes reducing the TACC to 515 tonnes so as to retain the existing TAC while adjusting the recreational allowance to reflect best available survey information on recreational harvest.

163 MFish recommends retaining the existing TACC. The adjustment to the recreational allowance, if adopted, would be technical – that is, it would not result in any increase in recreational catch – and therefore a decrease in commercial catch would not be required to retain the current situation in terms of stock rebuild and rate of the stock. A reduction to the TACC would only be required if you considered a faster rebuild or a larger target stock size was required. MFish notes there is insufficient information to support a need for further catch reductions at this time.

Discussion of KAH 2 options

164 Current stock status relative to B_{MSY} is unknown for KAH 2. The current TAC and associated management objective of growing stock size, is considered not to be inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, B_{MSY}.

165 Available information on the stock and current non-commercial allowances is limited and highly uncertain. MFish therefore recommends caution when using this information to choose between TAC, allowances and TACC options.

166 MFish recommends you retain the existing TAC, allowances and TACC (Option 1); MFish considers the survey information on recreational allowances is not sufficiently robust to warrant changing the existing settings.

167 If you do wish to adjust the recreational allowance to reflect the 2001 recreational harvest estimate, MFish recommends that you adopt Option 3 and increase the TAC, the recreational allowance and the allowance for other sources of fishing mortality. This is because Option 3 appropriately reflects the fact that the adjustment is based on available survey information on recreational harvest and would not result in any additional catch that might impact on the current management objective to rebuild the stock.

Review of KAH 3 Fishstock

Stock status information

168 The 2010 Plenary Report states the following about stock status for KAH 3:

- the status of KAH 2 relative to B_{MSY} is unknown; and
- it is not known if the current catches, allowances or TACCs are sustainable.

169 Some submitters submitted anecdotal information on stock status:

- People submitting through the option4 website were asked to compare the numbers of kahawai in their area currently to the number in the 1980s. For KAH 3, 23% indicated current stock size is half the size or larger than it was in the 1980s, and 77% believe the stock size is less than half the size it was in the 1980s.
- Some commercial submitters contended there was evidence in support of a healthy stock. The Guild referred to increasing trends in commercial bycatch of kahawai as support for this view. Both Sanford and SeaFIC referred to a number of fishing magazine articles that suggest kahawai are plentiful and often found in large schools.

170 The information provided by submitters is somewhat contradictory and, as previously noted, trends in fisher observations, commercial bycatch and CPUE trends, and magazine articles are not, on their own, considered to be reliable indicators of relative levels of biomass.

Fishery information

KAH 3 Maori customary non-commercial fishery

171 A robust estimate of Maori customary catch currently taken in KAH 3 is not available at this time. Available records of customary catch taken under the Fisheries (South Island Customary Fishing) Regulations 1999 (the Customary Regulations) record 67 kilograms total since 1999 with no catch of kahawai reported since 2001. Notwithstanding the fact that Ngai Tahu has rohe moana across a large proportion of the coastline, these figures are still likely to underestimate customary catch, particularly due to factors like variable reporting units, and accuracy.

KAH 3 recreational fishery

172 Recreational harvest estimates undertaken for KAH 3 are summarised in Table 10. MFish notes certain qualifications are recommended in the use of these estimates:

- Current QMAs for KAH stocks do not align with the strata used in the historical harvest estimate surveys (specifically in KAH 3 and KAH 8);
- Recreational catches are likely to be variable between years;
- The 2000 and 2001 estimates for KAH stocks are possibly overestimated.

Table 10. Recreational harvest estimates for KAH 3.

Year	Estimate (t)	Range	CV (%)
Tel/diary survey			
1991-92	210	160-260	
1996	137	125-145	7
2000	667	564-771	16
2001	570	-	18

KAH 3 commercial fishery

173 Figure 6 shows the history of commercial landings of KAH 3 since 1979. A purse seine target kahawai fishery catch limit was introduced in 1989-90 and, after QMS introduction in October 2004, a TACC was set. These limits are shown in Figure 6 as a solid line. The initial TAC and TACC set in 2004 were reduced in 2005.

174 Historically, KAH 3 supported the largest kahawai fishery in NZ. The closing of a Nelson cannery and the consequential shift outside the region of the only two purse seine vessels domiciled in the South Island led to a reduction of kahawai catches in KAH 3 prior to the introduction of the stock into the QMS.

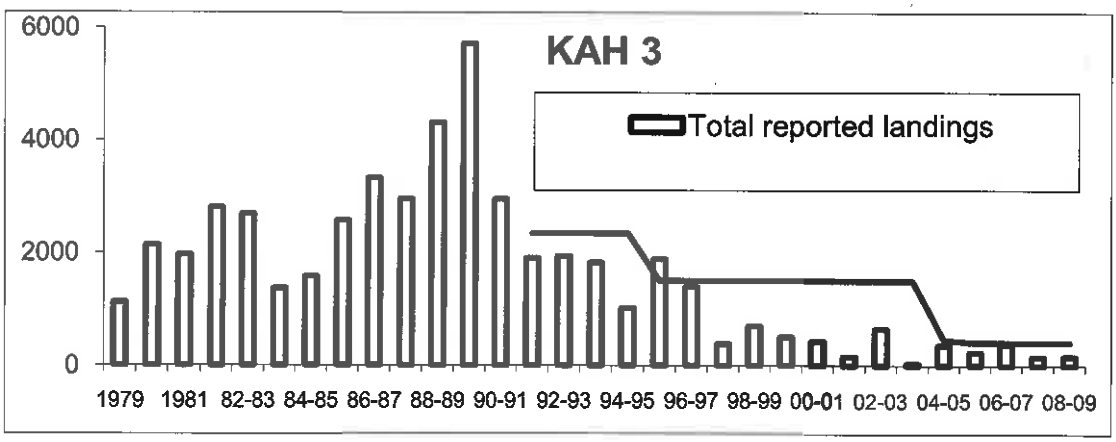

Figure 6: Historical landings, Purse seine catch limits and TACC (tonnes) for KAH 3.

Management options for KAH 3

175 MFish proposes the following options for KAH 3:

Table 11. Proposed TAC, Allowances and TACC options for KAH 3 (tonnes).

Option	TAC	Customary Allowance	Recreational Allowance	Fishing related mortality	TACC
KAH 3					
Option 1 *Status quo*	935	115	390	20	410
Option 2	935	115	510	20	290
Option 3	1077	115	510	22	410

176 In short:

- **Option 1** - retains the existing TAC, allowances and TACC for KAH 3; or
- **Option 2** – retains the existing TAC, increases the recreational allowance to reflect best available survey information on recreational catch and reduces the TACC by a commensurate amount;
- **Option 3** - increases the TAC to 1,077 tonnes to reflect a change to the recreational allowance based on the most recent recreational harvest estimate.

177 Option 3 is new and was not included in the IPP.

KAH 3 TAC options

178 In regard to TAC setting, MFish proposes either:

- Retaining the existing TAC of 935 tonnes for KAH 3 **(Options 1 & 2)**; or
- increasing the TAC to 1,077 tonnes to reflect a change to the recreational allowance based on the best available recreational harvest estimate **(Option 3)**.

179 Current stock size is unknown for KAH 3 and no target stock level has been specified for the stock. When kahawai was introduced into the QMS in 2004, the KAH 3 TAC was set using averaged commercial landings from the period 1998-03, and estimates of recreational and Maori customary catch based on recreational harvest survey information. The TAC, TACC and allowances decisions reflected decisions already made for the fishery (principally purse seine catch limits)and each sector's reliance on the kahawai fishery at that time, but included reductions in catch (excepting customary Maori) of 15% to ensure the biomass was maintained and, preferably, increased. KAH 3 was reviewed in 2005, and the TAC, allowances and TACC were reduced by 10% to provide greater certainty that the biomass would increase. The reduction to the recreational allowance was not accompanied by a tool to further constrain recreational catches, as catches were considered to be within the new allowance set.

180 MFish notes that, although the KAH 3 stock status is unknown, the management objective of growing stock size is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, B_{MSY}.

181 Submissions generally supported the status quo TAC of 935 tonnes, apart from Joint Submitters and 84 individual email website submission that supported further reductions to the TAC (to 815 tonnes). The Joint Submitters proposal is based on reducing commercial catch to a bycatch level only. MFish notes there is insufficient information to support a need for a further TAC reduction at this time. A national stock assessment for kahawai is expected to be completed in 2013 and should provide new information for reviewing the KAH 3 catch limits. MFish notes also that management at the level of commercial bycatch would involve a significant reductions to the TACC based on very limited and highly uncertain information on stock status and relative stock values.

182 The NZRFC submits that KAH 3 is performing at a very different level from other QMAs and TAC options do not address this issue. The Kaikoura Boating Club submits the KAH 3 fishery is "commercially extinct" with over 10,000 tonnes taken from the Kaikoura coast between 1982 and 2001 but very little since. MFish notes that the performance of the commercial fishery in KAH 3 is related to factors such as structure of the fishing fleet, market demand for particular species, and the implementation of voluntary arrangements. The fishery was influenced by the closure of a cannery that reduced market demand for kahawai taken from South Island waters and the loss of the Nelson domiciled purse seine vessels. Since 1992/93 purse seine vessels were restricted from fishing off Kaikoura on a voluntary basis, an area once heavily fished. Current catch limits reflect this reduced fishery performance in KAH 3 as it occurred prior to introduction into the QMS.

183 MFish notes that despite being larger, the TAC under Option 3 would not result in a slower rebuild to the stock. The TAC proposed under Option 3 reflects a technical adjustment to the recreational allowance only and would not result in more catch being taken.

184 Only Option 2 would have an immediate impact on social, cultural and economic factors through the proposed reduction in commercial catch. MFish notes that if stock size increases as sought under all of the options, non-commercial fishers may incrementally receive benefits from increasing catch rates and availability of kahawai and commercial fishers may experience incremental costs from increased difficulty managing bycatch.

185 Apart from the existing TAC, allowances and TACC, other important existing fisheries management controls for KAH 3 include the following:

- Kahawai is subject to daily bag limit of 15 kahawai in the Southern Region Fishery Management Areas;
- A minimum net mesh size of 90 mm for set net applies in KAH 3 for both commercial and non-commercial fishers;
- The recreational sector has previously identified conflicts between non-commercial fishing activities and commercial target fishing for kahawai, particularly by purse seiners. These concerns are currently mitigated by voluntary agreements.

186 MFish does not consider that adopting any of the proposed options would affect the need for or effectiveness of, or require changes to, these existing controls.

Setting of non-commercial allowances and the TACC for KAH 3

187 Turning to the setting of non-commercial allowances and the TACC for KAH 3, MFish proposes the same Maori customary allowance, but different option for allowances for recreational and other sources of mortality and TACCs. You are, of course, free to adopt different allowances and TACCs to those proposed.

Allowance for Maori customary non-commercial interests

188 MFish proposes retaining the existing Maori customary allowance of 115 tonnes for KAH 3.

189 Sanford submitted that a Maori customary allowance of 10 tonnes would be more than sufficient for customary purposes. Information on customary catch is, at this time, uncertain; consequently it is proposed to take a cautious approach when adjusting the Maori customary non-commercial allowance. MFish notes any change to the allowance would represent a technical adjustment to reflect new information and would not make any additional catch available for allocation to other sectors.

190 Section 21(4) requires that any mataitai reserve or closures/restrictions under s 186A to facilitate customary Maori fishing be taken into account. There are 6 mätaitai reserves within KAH 3. These reserves are located at Lyttleton Harbour; Koukourarata (Port Levy), Banks Peninsula; Paterson Inlet, Stewart Island; Mataura River, Southland. MFish considers that the location and extent of these reserves do not have implications for your decisions.

Allowance for recreational interests

191 Option 1 proposes retaining the status quo recreational allowance of 390 tonnes for KAH 3 and reflects a cautious approach to change given the lack of recent information about the level of recreational harvest. MFish notes that catches were considered to be within this allowance when it was set in 2005.

192 Options 2 and 3 propose a higher recreational allowance of 510 tonnes based on the single point estimate of recreational catch from the 2001 survey. MFish notes the KAH 3 estimate provided by the survey was 570 tonnes, however, 60 tonnes was subtracted to account for boundary differences post QMS introduction.

193 The 2001 survey constitutes the best available information on recreational harvest levels in KAH 3. However, the Recreational Technical Working Group recommends that harvest estimates from all the diary surveys should be used only with the following qualifications: a) they may be very inaccurate; b) the 1996 and earlier surveys contain a methodological error; and, c) the 2000 and 2001 harvest estimates are implausibly high for many important fisheries.

194 Sanford submits that the 2001 estimate is implausibly high. MFish notes that new information on recreational harvest in likely to become available in 2012-13 as a result of a large-scale multi-species recreational marine fishing survey (LSMS) due to start in 2011.

195 MFish recommends retaining the status quo recreational allowance (Option 1). Information is highly uncertain and therefore MFish considers a cautious approach to adjusting the allowance is warranted.

Allowance for other sources of fishing-related mortality

196 MFish proposes retaining an arbitrary 2% of the TAC as a basis for providing an allowance for all other sources of fishing relating mortality. No submissions were received on this topic.

Total Allowable Commercial Catch (TACC)

197 Proposed TACCs for KAH 3 are set out in Table 11. Options 1 and 3 propose retaining the existing TACC for KAH 3 of 410 tonnes. Option 2 proposes reducing the TACC to 290 tonnes so as to retain the existing TAC while adjusting the recreational allowance to reflect best available survey information on recreational harvest.

198 MFish recommends retaining the existing TACC. The adjustment to the recreational allowance, if adopted, would be technical – that is, it would not result in any increase in recreational catch – and therefore a decrease in commercial catch would not be required to retain the current situation in terms of stock rebuild and rate of rebuild. A reduction to the TACC would only be required if you considered a faster rebuild or a larger target stock size was required. MFish notes there is insufficient information to support a need for further catch reductions at this time.

Discussion of KAH 3 options

199 Current stock status relative to B_{MSY} is unknown for KAH 3. The current TAC and associated management objective of growing stock size, is considered not to be inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, B_{MSY}.

200 Available information on the stock and current non-commercial allowances is limited and highly uncertain. MFish therefore recommends caution when using this information to choose between TAC, allowances and TACC options.

201 MFish recommends you retain the existing TAC, allowances and TACC (Option 1); MFish considers the survey information on recreational allowances is not sufficiently robust to warrant changing the existing settings.

202 If you do wish to adjust the recreational allowance to reflect the 2001 recreational harvest estimate, MFish recommends that you adopt Option 3 and increase the TAC, and the recreational allowance and the allowance for other sources of fishing mortality. This is because Option 3 appropriately reflects the fact that the adjustment reflects available survey information on recreational harvest and would not result in any additional catch that might impact the current management objective to rebuild the stock.

Review of KAH 8 Fishstock

Stock status information

203 The 2010 Plenary Report states the following about stock status for KAH 8:

- the status of KAH 8 relative to B_{MSY} is unknown; and
- it is not known if the current catches, allowances or TACCs are sustainable.

204 Some submitters submitted anecdotal information on stock status:

- People submitting through the option4 website were asked to compare the numbers of kahawai in their area currently to the number in the 1980s. For KAH 8, about 49% indicated current stock size is half the size or larger than it was in the 1980s, and about 51% believe the stock size is less than half the size it was in the 1980s.
- Some commercial submitters contended there was evidence in support of a healthy stock. The Guild referred to increasing trends in commercial bycatch of kahawai as support for this view. Both Sanford and SeaFIC referred to a number of fishing magazine articles that suggest kahawai are plentiful and often found in large schools.

205 The information provided by submitters is somewhat contradictory and, as previously noted, trends in fisher observations, commercial bycatch and CPUE trends, and magazine articles are not, on their own, considered to be reliable indicators of relative levels of biomass.

Fishery information

KAH 8 Maori customary non-commercial fishery

206 A robust estimate of Maori customary catch currently taken in KAH 8 is not available at this time. Available records of customary catch taken under the Kaimoana Regulations provide the following quantities: 30 kg in 2007; 40 kg in 2008; and, 0 kg in 2009.[20] These figures are likely to significantly underestimate customary catch as many iwi and hapu in KAH 8 still issue customary fishing permits under r27A of the Amateur Regulations, which does not require reporting of customary permits issued or catch taken. In addition, customary catch information reported under the Kaimoana Regulations is, at this time, uncertain due to variable reporting units, frequency and accuracy.

[20] Some of these catches were reported in numbers of fish, and weights have been calculated assuming an average individual fish weight of 1 kg.

KAH 8 recreational fishery

207 Recreational harvest estimates undertaken for FMA 9 (a major component of KAH 8) are summarised in Table 12.

Table 12. Recreational harvest estimates for FMA 9.

Year	Estimate (t)	Range	CV (%)
Telephone/diary survey			
1993-94	340	285-395	
1996	204	195-225	9
2000	441	354-527	20
2001	609	-	24

208 MFish notes certain qualifications are recommended in the use of these estimates:

- Current QMAs for KAH stocks do not align with the strata used in the historical harvest estimate surveys (specifically in KAH 3 and KAH 8);
- Recreational catches are likely to be variable between years;
- The 2000 and 2001 estimates for KAH stocks are possibly overestimated.

KAH 8 commercial fishery

209 Figure 7 shows the history of commercial landings of KAH 8 since 1979. At QMS introduction in October 2004, a TACC of 580 tonnes was set. The initial TAC and TACC set in 2004 were reduced to 1,040 and 520 tonnes respectively in 2005.

210 In contrast to the primarily purse seine commercial fisheries in KAH 1, 2 and 3, kahawai is mostly taken as bycatch in trawl fisheries in KAH 8.

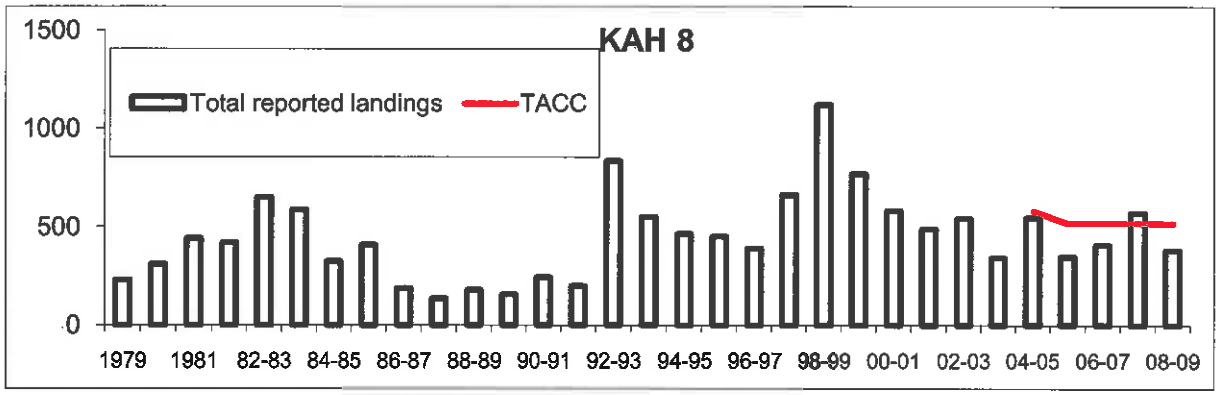

Figure 7: Historical landings and TACC (tonnes) for KAH 8.

Management options for KAH 8

211 MFish proposes the following management options for KAH 8:

Table 13. Proposed TACs, Allowances and TACC options for KAH 8 (tonnes).

Option	TAC	Customary Allowance	Recreational Allowance	Fishing related mortality	TACC
KAH 8					
Option 1 *Status quo*	1,040	115	385	20	520
Option 2	1,155	125	425	25	580

212 Option 1 proposes to retain the existing TAC, allowances and TACC, and therefore the existing management objective to increase biomass levels from current levels.

213 Option 2 increases the TAC, allowances and TACC to the levels set in 2004. This option reflects the consensus view of stakeholders in 2005 that the stock was at a comparatively higher biomass than other kahawai fishstocks and that a smaller degree of biomass increase was required.

214 Option 2 is new and was not included in the IPP.

215 MFish notes it is unclear, based on submissions on the IPP, whether the 2005 consensus view in respect of Option 2 still exists.

KAH 8 TAC options

216 In regard to TAC setting, MFish proposes either:

- retaining the current TAC (Option 1); or.
- increasing the TAC from 1,040 to 1,155 tonnes (Option 2).

217 Current stock size is unknown for KAH 8 and no target stock level has been specified. When kahawai was introduced into the QMS in 2004, the KAH 8 TAC was set on the basis of averaged commercial landings from the period 1998-2003, the recreational diary estimates for 2000 and an assessment of customary catch based on 25% of the recreational estimate. This period of catches reflected policy decisions already made for the fishery (principally the fishing permit moratorium) and each sector's reliance on the kahawai fishery at that time, but with reductions in catch (excepting customary Maori catch) of 15% to ensure the biomass was maintained and preferably to provide for an increase in biomass. KAH 8 was reviewed in 2005, and the TAC, allowances and the TACC were reduced by 10% to provide greater certainty that the biomass would increase. The reduction to the recreational allowance was not accompanied by a tool to further constrain recreational catches, as catches were considered to be within the new allowance set.

218 MFish notes that, although the KAH 8 stock status is unknown, the management objective of growing stock size, which is associated with the existing TAC is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, B_{MSY}.

219 In regards to the way and rate of rebuild, MFish notes that Option 2 would likely result in a slower rebuild of the KAH 8 stock that Option 1.

220 Apart from the existing TAC, allowances and TACC, other important existing fisheries management controls for KAH 8 include the following:

- Kahawai is subject to the combined daily bag limit of 20 finfish in the Central and North Region Fishery Management Areas;
- A minimum net mesh size of 90 mm for set net applies and 85mm for drag nets in KAH 8 for both commercial and non-commercial fishers;

221 MFish does not consider that adopting any of the proposed options would affect the need for or effectiveness of, or require changes to, these existing controls.

Setting of non-commercial allowances and the TACC for KAH 8

222 Turning to the setting of non-commercial allowances and the TACC for KAH 8, MFish proposes the same Maori customary allowance, but different options for allowances for recreational and other sources of mortality and TACCs. You are, of course, free to adopt different allowances and TACCs to those proposed.

Allowance for Maori customary non-commercial interests

223 MFish proposes retaining the existing Maori customary allowance of 115 tonnes for KAH 8.

224 Sanford submits that a Maori customary allowance of 10 tonnes "would be more than sufficient for customary purposes". MFish suggests caution when adjusting the allowance for Maori customary purposes as available information on customary harvest is highly uncertain. MFish notes any change to the allowance would represent a technical adjustment only to reflect new information and, if made, would not make any additional catch available for allocation to other sectors.

225 Section 21(4) requires that any mataitai reserve or closures/restrictions under s 186A to facilitate customary Maori fishing be taken into account. There is one mätaitai reserve within KAH 8. This reserve is located at Aotea Harbour. MFish considers the reserve has no implications for your decision.

Allowance for recreational interests

226 Option 1 retains the *status quo* recreational allowance of 385 tonnes for KAH 8 and reflects a cautious approach to change given the absence of new information about the level of current recreational catch.

227 Option 2 sets a higher recreational allowance of 425 tonnes based on a single point estimate (2000 survey) of recreational catch. The 2000 survey contains a very high level of uncertainty but this estimate constitutes the best available information.

228 Sanford submits that the 2000 estimate is implausibly high. MFish acknowledges that the estimates are highly uncertain. MFish notes that new information on recreational harvest in likely to become available in 2012-13 as a result of a large-scale multi-species recreational marine fishing survey (LSMS) due to start in 2011.

229 MFish recommends retaining the status quo recreational allowance (Option 1). It is unclear whether consensus still exists regarding comparative stock status in KAH 8 and available information on recreational harvest is highly uncertain. MFish therefore considers a cautious approach to adjusting the allowance is warranted.

Allowance for other sources of fishing-related mortality

230 MFish proposes retaining an arbitrary 2% of the TAC as a basis for providing an allowance for all other sources of fishing relating mortality. No submissions were received on this topic.

Total Allowable Commercial Catch (TACC)

231 Proposed TACCs for KAH 2 are set out in Table 13. Option 1 retains the existing TACC of 520 tonnes whereas Option 2 increases the TACC to 580 tonnes.

232 The current TACC is set at a lower level than that which would allow for historical levels of bycatch of kahawai in KAH 8. Because of the greater risk of economic impacts to Industry of a TACC reduction in this fishstock than for other fishstocks, in the IPP MFish proposed the status quo (Option 1) only for KAH 8. MFish noted that there was consensus among stakeholders for retaining the status quo in 2005. In particular recreational fishers at that time:

- expressed satisfaction with their catch rates.
- do not believe they have been disadvantaged by any low historical biomass of the fishery in this area.
- recognise the need for providing for commercial bycatch in KAH 8.

233 Sanford submits that while the IPP correctly stated the position in 2005, it failed to explain that the status quo that the parties agreed in 2005 was not the current TACC (520t), but rather the TACC before the 2005 10% reduction occurred (580t). MFish accepts Sanford's point. Despite the consensus in 2005 the previous Minister did reduce the KAH 8 TACC by 10%.

234 MFish considers that you should therefore have the opportunity to consider raising the TACC by 60 tonnes in KAH 8 on the basis that it restores catch limits to historical levels of bycatch, reduces economic impacts to Industry, and reduces potential wastage. This proposal had the agreement of all sector stakeholder representatives in 2005. This option has been included as Option 2.

Discussion of KAH 8 options

235 Current stock status relative to B_{MSY} is unknown for KAH 8. The current TAC and associated management objective of growing stock size, is considered not to be inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, B_{MSY}.

236 Option 1 proposes that you retain the status quo TAC that was set in 2005. No new information on stock status is available to inform an alternative TAC at this time.

237 Option 2 proposes that you set the TAC to the level it was set at in 2004, which is 1,155 tonnes (ie, before the 10% reduction to the TAC, allowances and TACC made in 2005). In 2005 there was a consensus view among stakeholders tht the 10% reduction was not required because of the different nature of the KAH 8 fishery in comparison to other kahawai stocks.

238 MFish recommends that you retain the status quo TAC, allowances and TACC at this time (Option 1) because:

- It is unclear from submissions whether there is still stakeholder agreement around the status of the fishery or the management approach set out in Option 2;
- Available information on stock status and non-commercial allowances is limited and highly uncertain;
- New stock assessment information should be available to better inform management options in 2013.

Review of KAH 4 and KAH 10 Fishstocks

Stock status information

239 The 2010 Plenary Report states the following about stock status for KAH 4 and KAH 10:

- The status of KAH 4 and KAH 10 relative to B_{MSY} are unknown.
- It is not known if the current catches, allowances or TACCs in KAH 4 and KAH 10 are sustainable

240 Joint Submitters noted that the experience and observations of hundreds of non-commercial fishers do not support that unfished biomass has only been reduced to about 50%. Those submitting through the option4 website were asked to compare the numbers of kahawai in their area currently to the number in the 1980s. In KAH 4 both submissions believe there is about 70% less biomass than in the 1980s. None of the submissions related to KAH 10.

241 MFish notes that neither KAH 4 or KAH 10 have been subject to much fishing.

Fishery information

242 No estimate of Maori customary catch taken in KAH 4 or 10 is available. No records of catch for either fishstock have been logged on the customary database.

243 Similarly no estimates of recreational catch are listed for KAH 4 or KAH 10 from any recreational fishing survey.

244 Reported commercial catch records are scant and reported in the table 14 below.

Table 14 Reported commercial catch landings.

Year	KAH 4 (kilograms)	KAH 10 (kilograms)
2001-02	0	0
2002-03	0	0
2003-04	0	0
2004-05	146	0
2005-06	0	0
2006-07	2	0
2007-08	0	0
2008-09	0	0

Management options for KAH 4 and KAH 10

245 For KAH 4 and KAH 10 TACs and allowances are based on nominal values. No new information is available to inform a change from the status quo therefore MFish recommends existing TACs, TACCs and allowances be retained.

Table 15 Proposed TAC, Allowances and TACC options for KAH 4 and 10 (tonnes).

Fish stock	TAC	Customary Allowance	Recreational Allowance	Fishing related mortality	TACC
KAH 4					
Status quo	14	1	4	0	9
KAH 10					
Status quo	14	1	4	0	9

Other Management Measures – all KAH stocks

Review of management measures to control recreational landings

246 The introduction of a minimum legal size (MLS) for kahawai is a possible option to constrain recreational landings. Some information available indicates kahawai is landed at a variety of sizes, with small kahawai popular as bait. However, without a better understanding of size selectivity and fisher behaviour it is difficult to assess how effective a MLS would be to control landings in recreational fisheries.

247 Recreational daily bag limits for kahawai are based on a mixed bag of species with a limit of 20 per person per day (an exception is the Southern Fishery Management Areas in which an individual species daily limit of 15 kahawai applies). Within the mixed bag limit, if kahawai is the only species taken, then up to 20 may be taken per person per day. If any reduction in the recreational catch of kahawai is to be contemplated, MFish's preferred option would be to reduce daily bag limits.

KAH 1

248 The proposal for varying the recreational allowance in KAH 1 is based on the most plausible estimates of the current levels of catch. Accordingly there is no reason to consider other management measures at this time. If the stock size is allowed to increase from current levels, then with increased availability, non-commercial catches are also likely to increase. Accordingly, adopting this TAC option will require consideration of additional management measures (such as reducing bag limits) in the future to ensure target stock size is achieved. The stock assessment projections suggest additional constraints on recreational fishing may be required around 2014.

Other KAH stocks

249 There is considerable uncertainty about estimates of recreational catch. Anecdotal evidence from the recreational sector suggests that, in the short term, recreational catches are within the allowances that are currently set for these stocks even if no change is made to daily bag limits. MFish has no information to confirm or refute this.

250 Should you choose to retain the status quo allowances for other kahawai stocks, MFish considers that a reduction in the daily bag limit would not be required. While these allowances were originally set based on a theoretical 15% reduction in the recreational catch, the information used at the time (the 1999/2000 recreational diary harvest estimate) had uncertainties and potential for overestimation.

251 SeaFIC submits that the lack of apparent intent to implement any meaningful controls on recreational catches through bag limits is disturbing. They consider that the 'allowance' for recreational fishing has no real effect in terms of limiting catch. TOKM submits that reductions in TACCs in 2005 were not matched by a proportional reduction in bag limits. Sanford submits that the failure to propose reduced bag limits in these areas constitutes a failure to follow the direction of the Court and a settlement reached with commercial fishers.

252 MFish does not agree with the commercial sector comments that the recreational sector is unconstrained, and that management tools have been ineffective. With regard to management, bag limits are imposed on the recreational sector, although there effect is difficult to determine from available data.

Deemed values

253 MFish recommends retaining the existing interim and annual deemed values for all kahawai stocks.

254 Under the 1996 Act, overfishing is controlled in the first instance by the application of graduated administrative disincentives (interim and deemed values). This deemed value framework provides an incentive for fishers to acquire sufficient ACE to balance against catch. The current deemed values set for kahawai are shown in Table 16. Standard ramping provisions apply to all kahawai stocks.

Table 16: Deemed values for kahawai:

Fishstock	Interim Deemed Value ($/kg)	Annual Deemed Value ($/kg)
KAH 1	0.33	0.66
KAH 2	0.31	0.61
KAH 3	0.31	0.61
KAH 4	0.31	0.61
KAH 8	0.31	0.61
KAH 10	0.33	0.66

255 MFish has a Deemed Value Standard that sets out a process and criteria for managing the setting, reviewing and amendment of deemed value rates, including the need to review deemed values after changes to the TACC. After reviewing the relevant information, MFish considers that the criteria for reviewing the deemed values for kahawai stocks are not triggered at this time. MFish proposes continuing to monitor the use of the deemed value provision for kahawai stocks against this standard and if and when necessary review the deemed value rates as part of a future sustainability round. Accordingly MFish proposes no change is required to the current deemed values for kahawai.

256 Under s 75(1) of the Act, you are required to set interim and annual deemed value rates for each quota management stock. Section 75(2A) requires you, when setting deemed value rates, to take into account the need to provide an incentive for every commercial fisher to acquire and hold sufficient annual catch entitlement (ACE) in respect of each fishing year that is not less than the total catch of that stock taken by the commercial fisher.

257 MFish's general policy is to set deemed values for a fishstock between the ACE price and port price. This approach creates an economic incentive for fishers to act appropriately and balance any overcatch against ACE, if ACE is available. Alternatively, if ACE is not available, this approach creates an economic incentive to land and record any overcaught fish rather than discard them at sea.

258 Joint submitters submit that deemed value rates for kahawai are not constraining commercial catch to limits set in 2005. MFish notes that the contention that TACCs for KAH 1, 2, 3 4 and 10 do not constrain reported commercial landings is not supported by data. MFish is monitoring KAH 8, and will continue to monitor the effectiveness of the deemed values for all kahawai stocks.

259 Sanford supported the retention of the current deemed value for kahawai.

260 MFish considers that no changes are required to the deemed values for any stocks of kahawai.

Inclusion of all kahawai stocks on the 6th Schedule

261 Pelco has requested in the past that kahawai be included on the Sixth Schedule of the Fisheries Act to reduce the socio-economic impact of constraining TACCs and provide fishers with some flexibility to control catch. In the IPP MFish suggested this proposal would require further consideration of survivability of purse seine caught kahawai and proposed to defer further consideration until such time as this matter might be considered as part of the National Inshore Fisheries Plan for Finfish and subject to operational priorities.

262 SeaFIC submits that the issue be considered as part of the Joint MFish Industry Working Group on discards. Sanford submits that it does not support the proposal because to do so would allow fish that are unlikely to survive to be released. Accordingly, MFish does not intend to progress this proposal further in the absence of support from a major quota holder.

Recommendations

Kahawai 1 (KAH 1)

263 In relation to the KAH 1 fishery, MFish recommends that, for the fishing year commencing on 1 October 2010, you:

EITHER

Agree to Option 1 and pursuant to section 13(2) of the Act, to decrease the TAC to 2,000 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Decrease the customary allowance to 200 tonnes;

ii) Decrease the recreational allowance to 900 tonnes;

iii) Decrease the allowance for other sources of fishing-related mortality to 40 tonnes;

iv) Decrease the TACC to 860 tonnes.

OR

Agree to Option 2 **(MFish preferred option)** and pursuant to section 13(2) of the Act, to decrease the TAC to 2,220 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Decrease the customary allowance to 200 tonnes;

ii) Decrease the recreational allowance to 900 tonnes;

iii) Decrease the allowance for other sources of fishing-related mortality to 45 tonnes;

iv) Retain the TACC of 1,075 tonnes.

OR

Agree to Option 3 and pursuant to section 13(2) of the Act, to decrease the TAC of 2,885 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Decrease the customary allowance to 200 tonnes;

ii) Decrease the recreational allowance to 900 tonnes;

iii) Decrease the allowance for other sources of fishing-related mortality to 60 tonnes;

iv) Increase the TACC to 1,725 tonnes.

Kahawai 2 (KAH 2)

264 In relation to the KAH 2 fishery, MFish recommends that, for the fishing year commencing on 1 October 2010, you:

EITHER

Agree to Option 1 **(MFish preferred option)** and pursuant to section 13(2A) of the Act, to retain the TAC of 1,530 tonnes and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 185 tonnes;

ii) Retain the recreational allowance of 610 tonnes;

iii) Retain the allowance for other sources of fishing-related mortality of 30 tonnes;

iv) Retain the TACC of 705 tonnes.

OR

Agree to Option 2 and pursuant to section 13(2A) of the Act, to retain the TAC of 1,530 tonnes and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 185 tonnes;

ii) Increase the recreational allowance to 800 tonnes;

iii) Retain the allowance for other sources of fishing-related mortality at 30 tonnes;

iv) Decrease the TACC to 515 tonnes.

OR

Agree to Option 3 and pursuant to section 13(2A) of the Act, to increase the TAC to 1,725 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 185 tonnes;

ii) Increase the recreational allowance to 800 tonnes;

iii) Increase the allowance for other sources of fishing-related mortality to 35 tonnes;

iv) Retain the TACC of 705 tonnes.

Kahawai 3 (KAH 3)

265 In relation to the KAH 3 fishery, MFish recommends that, for the fishing year commencing on 1 October 2010, you:

EITHER

Agree to Option 1 **(MFish preferred option)** and pursuant to section 13(2A) of the Act, to retain the TAC of 935 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 115 tonnes;

ii) Retain the recreational allowance of 390 tonnes;

iii) Retain the allowance for other sources of fishing-related mortality of 20 tonnes;

iv) Retain the TACC of 410 tonnes.

OR

Agree to Option 2 and pursuant to section 13(2A) of the Act, to retain the TAC of 935 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 115 tonnes;

ii) Increase the recreational allowance to 510 tonnes;

iii) Retain the allowance for other sources of fishing-related mortality of 20 tonnes;

iv) Decrease the TACC to 290 tonnes.

OR

Agree to Option 3 and pursuant to section 13(2A) of the Act, to increase the TAC to 1,075 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 115 tonnes;

ii) Increase the recreational allowance to 510 tonnes;

iii) Increase the allowance for other sources of fishing-related mortality to 22 tonnes;

iv) Retain the TACC of 410 tonnes.

Kahawai 4 (KAH 4)

266 In relation to the KAH 4 fishery, MFish recommends that, for the fishing year commencing on 1 October 2010, you:

Agree to Option 1 **(MFish preferred option)** and pursuant to section 13(2A) of **the** Act, to retain the TAC of 14 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 1 tonnes;

ii) Retain the recreational allowance of 4 tonnes;

iii) Retain the allowance for other sources of fishing-related mortality of 0 tonnes;

iv) Retain the TACC of 9 tonnes.

Kahawai 8 (KAH 8)

267 In relation to the KAH 8 fishery, MFish recommends that, for the fishing year commencing on 1 October 2010, you:

EITHER

Agree to Option 1 **(MFish preferred option)** and pursuant to section 13(2A) of the Act, to retain the TAC of 1,040 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 115 tonnes;

ii) Retain the recreational allowance of 385 tonnes;

iii) Retain the allowance for other sources of fishing-related mortality of 20 tonnes;

iv) Retain the TACC of 520 tonnes.

OR

Agree to Option 2 and pursuant to section 13(2A) of the Act, to increase the TAC to 1,155 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Increase the customary allowance to 125 tonnes;

ii) Increase the recreational allowance of 425 tonnes;

iii) Increase the allowance for other sources of fishing-related mortality of 25 tonnes;

iv) Increase the TACC of 580 tonnes.

Kahawai 10 (KAH 10)

268 In relation to the KAH 10 fishery, MFish recommends that, for the fishing year commencing on 1 October 2010, you:

Agree to Option 1 **(MFish preferred option)** and pursuant to section 13(2A) of the Act, to retain the TAC of 14 tonnes, and within this, pursuant to section 21 of the Act: Yes / No

i) Retain the customary allowance of 1 tonnes;

ii) Retain the recreational allowance of 4 tonnes;

iii) Retain the allowance for other sources of fishing-related mortality of 0 tonnes;

iv) Retain the TACC of 9 tonnes.

Leigh Mitchell
for Chief Executive

AGREED / ~~AGREED AS AMENDED / NOT AGREED~~

Hon Phil Heatley
Minister of Fisheries and Aquaculture

23 / 09 / 2010