

**In the High Court of New Zealand
Auckland Registry**

CIV2005-404-4495

Under Part I of the Judicature Amendment Act 1972

In the matter of an application for review

between

**The New Zealand Recreational Fishing Council Inc, and New Zealand Big
Game Fishing Council Inc**

Plaintiffs

and

Minister of Fisheries

First Respondent

and

The Chief Executive of the Ministry of Fisheries

Second Respondent

and

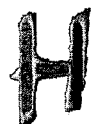
**Sanford Limited, Sealord Group Limited, and Pelagic & Tuna New Zealand
Limited**

Third Respondent

**Affidavit of Jonathan Clive Holdsworth in Support of Application for
Review**

Sworn this 26th day of August 2005

**Next Event Date:
Judicial Officer:**



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I, **Jonathan Clive Holdsworth**, of Whangarei, fisheries consultant and scientist, swear:

1. Qualifications and Experience

- 1.1 I am a fisheries consultant and scientist with 19 years experience in marine research and fisheries management in New Zealand.
- 1.2 I hold a Bachelor of Science in Zoology (1980) from the University of Auckland.
- 1.3 I was employed by MAF (later MAF Fisheries and the Ministry of Fisheries) as a fisheries science technician and subsequently as a fisheries policy analyst based in Whangarei, between 1986 and 1997. I was involved in a wide range of marine research projects including surveys of recreational fishers, tagging programmes for snapper, hapuku, kingfish and marlin, resource surveys for cockles, pipi and toheroa, multi species trawl surveys and an investigation of the survival rate of snapper caught and released by recreational fishers. I also provided fisheries management advice on a range of issues such as management of the commercial cockle fishery, resolving conflict between recreational and commercial drag net fishers and reviews of the Billfish Memorandum of Understanding between commercial and recreational fishers. In 1995 the Ministry of Fisheries was split from MAF and all fisheries research projects were offered to research providers via tender.
- 1.4 In 1997 I established Blue Water Marine Research Ltd to provide research and consultancy services on marine resource management.
- 1.5 Ministry of Fisheries research projects are reviewed by joint stakeholder and Ministry working groups and I have been an active member for the last six years of:
- a. The Pelagic Fisheries Assessment Working Group comprising the Ministry and stakeholders. This group proposes and reviews research into pelagic species, including kahawai.
 - b. The Recreational Research Planning Working Group comprising the Ministry and stakeholders. This group proposes and reviews research into recreational fisheries with a focus on harvest estimation.



- c. The Snapper Fisheries Assessment Working Group, which focuses on snapper stock assessment.
- 1.6 I have belonged to the Whangarei Deep Sea Anglers Club which is an affiliate member of the applicant the New Zealand Big Game Fishing Council for 15 years.
- 1.7 I have been a member of the New Zealand Recreational Fishing Council, an applicant in this proceeding, from 1999 to the present.
- 1.8 I have provided advice on scientific and fisheries management issues, through my company Blue Water Marine Research Ltd, to the applicant the New Zealand Big Game Fishing Council on fisheries matters for the last six years.
- 1.9 I have also provided fisheries research services through Blue Water Marine Research Ltd to NIWA, Kingett Mitchell Ltd, Pacific Coasts Research Institute, the Northland Scallop Company and the New Zealand Marine Research Foundation. I have been a contract research provider to the Ministry of Fisheries for the last five years. This work has primarily been in relation to the cooperative gamefish tagging programme, characterising the commercial and recreational striped marlin fishery, investigating methods for collecting data from recreational fishers and sampling recreational snapper catch in east Northland, Hauraki Gulf and the Bay of Plenty.
- 1.10 I have read the code of conduct for expert witnesses in Schedule 4 of the High Court Rules and agree to abide by it.

Part A – Introductory Matters

2. Outline

- 2.1 The purpose of my affidavit is to evaluate the Minister's 2004 decisions to set TACs, TACCs and "allow for" non-commercial interests in relation to kahawai stocks.
- 2.2 This affidavit contains the following sections:

Part A – Introductory Matters;

- i. Outline;
- ii. Terminology;
- iii. Summary;

- iv. Kahawai biology and fishery characteristics;
- v. Overview of the legislation;

Part B – The Minister's 2004 Decision to Set TACs and TACCs for Kahawai;

Part C – Initial Position Paper – July 2005;

Part D – Concluding Observations;

Part E – Appendix – Sustainability Information;

3. Terminology

3.1 In this, I use the following terms:

- a. "the Act" means the Fisheries Act 1996;
- b. " B_{MSY} " means the biomass level of fish stock that will produce maximum sustainable yield;
- c. "catch history" means estimates of past catch measured in tonnes;
- d. "the Commission" means the Treaty of Waitangi Fisheries Commission – Te Ohu Kai Moana;
- e. "CCL" means commercial catch limit;
- f. "FAP" means the Ministry's Final Advice Paper dated 29 June 2004;
- g. "IPP" means the Ministry's Initial Position Paper dated 12 January 2004;
- h. "the Ministry" means the Ministry of Fisheries (also known as MAF, MAF Fish or MFish);
- i. "the Minister" means the Minister of Fisheries;
- j. "MCY" means maximum constant yield, a form of MSY;
- k. "MSY" means maximum sustainable yield;
- l. "NIWA" means the National Institute of Water and Atmospheric Research;
- m. "RTWG" means the Recreational Technical Working Group;
- n. "QMA" means quota management area;

- o. "TAC" means total allowable catch;
- p. "TACC" means total allowable commercial catch;
- q. Unless the context otherwise indicates "the Minister's 2004 decision" means the Minister of Fisheries' 5 July 2004 decisions as communicated to stakeholders by letter dated 10 August 2004.

4. Summary

- 4.1 In the Minister's 2004 decision, the Minister was required to set initial TACs so as to move the kahawai stocks to a level at or above that which can produce maximum sustainable yield (MSY) in each kahawai quota management area (QMA). This was an initial sustainability and allocation decision to bring the species into the quota management system.
- 4.2 The mechanism for achieving this is to set a total allowable catch (TAC) for each of six fisheries management stocks under section 13 of the Fisheries Act 1996. The requisite information on current stock size and target stock size for each QMA was not available for the Minister to set TACs that would maintain kahawai stocks at or above a level that can produce MSY with any certainty. This information was not available because there has been insufficient stock assessment research on kahawai. The Minister acknowledged that the absence of this information meant setting TACs to achieve target stock levels in each QMA became a theoretical or academic exercise.
- 4.3 This meant that the Minister's 2004 decision was heavily discretionary. The Minister relied on Ministry advice to ensure sustainability. This included the results of simulation modelling in 1996 and 1997. The simulation of modelling gave a range of estimates of MSY and assumed (for simplicity) a single national stock for kahawai. The Minister used some of the results of this simulation modelling as a reference point for TAC setting, although he notes that the modelling is dated and the inputs into the assessment are increasingly regarded as being unreliable.
- 4.4 In the absence of a reliable stock assessment, current utilisation, based on recent catch history levels (more certain for commercial catch, but uncertain estimates in the case of the non-commercial catch), became

the effective method by which the Minister set TACs, and then allocated for non-commercial allowances and TACCs for each QMA.

- 4.5 In my opinion, this approach is problematic, and cannot reasonably ensure sustainability within each QMA for the following reasons:
- a. Basing the TACs on a national estimate of maximum sustainable yield that is divided up according to catch history for each QMA necessarily results in TACs being highest in QMAs where fishing pressure has been highest in the past.
 - b. This approach meant that the Minister's 2004 decision to base the TACs for each QMA on catch history has resulted in close to half (48%) of the overall TAC being allocated to the smallest QMA by size, which is KAH 1, covering an area from North Cape in Northland to Cape Runaway in the Bay of Plenty.
 - c. The approach of equating catch history with ensuring sustainable stock levels has, I believe, resulted in the Minister not having adequate or proper regard to available information concerning regional depletion within each QMA. This issue is most acute within KAH 1, where in setting the stock levels for KAH 1 the Minister had a duty to consider the sustainability concerns in the Hauraki Gulf. The Hauraki Gulf is one of the one of the most important recreational fishing areas in the country. I set out in the Appendix to this affidavit at paragraph 23 under the heading "Information on sustainability of the KAH 1 stock" known sustainability concerns for kahawai in the Hauraki Gulf. Research data and other information on fish size, and catch rates in the Hauraki Gulf suggests that kahawai stock levels within the Hauraki Gulf have been low for some time.
 - d. There was a reliance upon the Ministry's preferred policy position towards basing TACs on catch history without weight being given to other information, such as recreational catch rate information. While kahawai is an important component of non-commercial catch, recent catch rates (that is, catch per hour or per trip) have been low in KAH 1.
- 4.6 In addition to recent catch history being used to set TACs in each QMA, effectively the same "catch history" approach was taken in the Minister's other decisions to set the total allowable commercial catch (TACCs) in

each QMA, and also to allow for the non-commercial interests (both recreational and customary Maori).

- 4.7 In advising the Minister, the Ministry recognised that a higher kahawai biomass was beneficial to non-commercial interests. A higher biomass means more fish are available and the average fish size will be larger. However the Ministry's advice to the Minister focused on the *quantity* of non-commercial catch and not how the *quality* of fishing has changed due to a lower kahawai biomass. The quality of the recreational kahawai fishery is demonstrably poor in some areas. Recreational kahawai catch rates have remained low in recent years in spite of catch limits on the commercial purse seine method that commenced in 1991.
- 4.8 The selection of the *best available information* should be central to the Ministry's advice to the Minister when evaluating non-commercial fishing interests. Catch rate information is a reasonable measure of the state of a non-commercial fishery, as non-commercial fishers commonly measure a fishery on the basis of how readily fish can be caught, and fish size not the size of the collective "allowance" for their sector. Available information about non-commercial catch rate shows that it is low in many key regions.
- 4.9 The error of equating current reliance with non-commercial interests solely on the basis of sector catch history is illustrated, in the Hauraki Gulf, where the low levels of abundance mean that kahawai are hard to catch, require lengthy fishing effort and generate kahawai catches that are often disappointingly small in number and size.
- 4.10 The Minister has reduced the tonnage allowances for recreational fishers in all the main QMAs by an arbitrary 15%. Unlike commercial catches, there is no annual estimate of recreational landings and even the periodic recreational harvest survey estimates (4 years apart) have significant uncertainty. The only way that the Minister could effectively achieve a 15% reduction in recreational catch with any degree of certainty is by altering the existing amateur fishing regulations which specify bag limits (20 per person per day, along with several other species) and size limits (currently no size limit). The Minister suggests in his 2004 decision that a reduction in the daily bag limit per person is the most likely means of achieving this. However at present half of the fishers targeting kahawai catch none and catch rates per trip are low, on average. What this means is that very drastic cuts to recreational bag

limits would have been required to achieve a 15% reduction in recreational catch.

- 4.11 In fact, no recreational bag limit reductions have been applied by the Minister. However had the Ministry drawn the attention of the Minister to this available information on recreational catch rates, a clearer picture of the poor recreational catches and the potential impact of a 15% reduction would have been apparent. The Minister could have taken a more discriminating approach to allowing for non-commercial interests based on a more complete picture of the fishery and how the current problems arose.
- 4.12 The way in which "catch history" became the effective decision making tool for each key decision (for TACs, TACCs and for non-commercial "allowances") carries with it a danger that administrative ease and convenience of using catch history estimates to allocate the TAC between fishing sectors has been unduly influential in kahawai management decisions.
- 4.13 It is my opinion that it would have been both reasonable and proper for the Minister to have taken a more discriminating approach to setting TACs (rather than basing the TAC for each QMA solely on catch history).
- 4.14 Information of this type was available, at least for some of the QMAs. It could have been used to supplement estimates of current catch and estimates of national yield to enable the Minister to assess the sustainability of kahawai stocks in each QMA. In the situation where there is no stock assessment, and the fishery is a major non-commercial fishery, in my opinion it is reasonable to expect the Minister to consider a wider range of information as "best available" rather than being solely reliant on sector catch history information when evaluating:
- the sustainability of kahawai catch in each QMA;
 - the nature and extent of non-commercial interests, and
 - when allocating the fishery between fishing sectors.

5. **Kahawai biology and fishery characteristics**

- 5.1 The following is an overview of kahawai biology and fishery characteristics. The Ministry (the Ministry of Fisheries) discussed

"Species Information" on kahawai in Annex 2 between paragraphs 78 - 130 of the initial position paper (IPP) 2004.

- 5.2 There are two species of kahawai found in New Zealand: *Arripis trutta* is the most common and occurs throughout the coastal waters of New Zealand, primarily in the North Island and the upper South Island. The other, *Arripis xylabion*, known as auriri to Maori, is generally larger and can be caught during spring and summer in coastal Northland and is known from the Kermedec, Lord Howe and Norfolk Islands. Little is known of the life history of auriri. As far as is known auriri are not a large component of landed catch. The Minister has combined these two species for management purposes.
- 5.3 Kahawai are a pelagic school fish living a large part of their lives from mid-water to the surface. They are an inshore species occasionally seen over moderate depths but generally they are encountered in waters shallower than 50m. The 50m contour scribes a very narrow band around most of New Zealand – about 10 km wide in the Bay of Plenty but down to just a few kilometres wide on most of the east Northland and Wairarapa coasts.
- 5.4 Kahawai are an important link in the coastal food chain. They feed on a wide size range of prey, from planktonic krill to anchovy, pilchards and jack mackerels. By driving these prey species to the surface they make them available for many species of shallow diving sea bird. Kahawai in turn fall prey to larger predators, such as kingfish, sharks and dolphins. A significant reduction in the abundance of kahawai may reduce the availability of food for associated and dependant species.
- 5.5 Important factors in determining the potential yield of a species to human fishers are growth rate, age at maturity, and natural mortality. Kahawai growth rate is relatively slow for a pelagic species, with fish reaching about 15 cm at the end of the first year and 35 cm in four years. Most of the recreational and commercial catch is of fish 6 years and older. They become sexually mature at 4 or 5 years old and reach a maximum age of about 26 years. These biological characteristics are important when modelling the productivity of the stocks for fisheries management purposes.
- 5.6 Kahawai behaviour is important when considering their availability to recreational and some commercial fishing methods. Mature (adult) kahawai form visible schools when feeding on the surface. This

schooling activity often attracts flocks of birds including white-fronted terns (known as the kahawai bird), whose darting and diving feeding flight can be seen at a distance. Other fish species such as snapper and kingfish can be drawn to these schools, making them even more attractive to fishers.

- 5.7 Trolling small lures around these schools is a common technique for catching kahawai that was well known to early Maori who made very effective wooden lures inlaid with paua shell.
- 5.8 There was a time (as recently as 1980's) when there would be a kahawai school around most shallow reefs and headlands, they would come into bays and estuaries where they could be caught from shore. Historically, some of the largest shore based fisheries were located at river mouths. Kahawai at river mouths was a resource extensively utilised by Maori, both in modern and traditional times. Most notable amongst these is the fishery located at the Motu River mouth, in the Bay of Plenty.
- 5.9 Since the 1970s, the main commercial target fishery for kahawai has involved purse seine vessels, assisted by aerial spotter planes. The purse seine method involves running out a long net, with floats on the top and weights on the bottom, to encircle a school of fish. Once the circle is complete the bottom is drawn together or "pursed" using a wire cable hauled through steel rings. If some fish start to escape, before the purse is complete, then the whole school will follow. If the school remains near the surface the whole school is caught. Most of the net is hauled back on to the deck leaving a pocket of net to hold the fish alongside the boat. The fish are then scooped out of the purse seine and put into the hold with a large dip net. Some of the worlds largest fisheries for pelagic species (such as sardines, anchovy and skipjack tuna) use the purse seine method.
- 5.10 Kahawai have also been taken as by-catch of commercial methods such as trawl and longline fisheries targeting snapper and setnet fisheries targeting mullet.
- 5.11 Much of what is known about the movement of kahawai comes from tagging studies conducted in the 1980s and early 1990s. These tagging studies show that although a few kahawai moved considerable distances most were recaptured close to their release points.

- 5.12 In 1991, 9606 kahawai were tagged from purse seine vessels in the Bay of Plenty and in Tasman Bay. By 1997 there had been 780 recaptures reported. Of the fish tagged in the Bay of Plenty 96% of recaptures were made within 100 nautical miles of their release point. The Tasman Bay fish showed even less movement with 99% of recaptures within 50 nautical miles of where they were released. Most recaptures were made within 3 years of release.¹
- 5.13 Kahawai tagged off east Northland in the 1980s were mainly recaptured in Northland, Hauraki Gulf and Bay of Plenty. It seems likely that there is some mixing between these areas and some adult fish may move southward.
- 5.14 The National Institute of Water and Atmospheric Research ("NIWA") has sampled recreational kahawai catch in these three regions (Northland, Hauraki Gulf, Bay of Plenty) annually since the 2000–01 fishing year for the Ministry. These samples have shown that there are juvenile kahawai in the Hauraki Gulf but few adults. However, in the Bay of Plenty recreational fishers catch mainly adult kahawai and few juveniles.²
- 5.15 Stock assessment requires information on relative abundance from fishery data and the biological characteristics of the fish.
- 5.16 Often catch per unit effort (CPUE) information is analysed for trends that could be used as an index of the relative abundance of a stock. Tracking the changes over time is critical to effective stock assessment.
- 5.17 The danger of using commercial CPUE from the purse-seine fishery as a stock abundance index is that the assumed relationship between CPUE and abundance is confounded by the ability of purse-seine vessels, using spotter planes and catching whole schools, to maintain consistent catch rates until a stock is reduced to low biomass levels. This has been described in scientific literature as hyperstability in a fishery and results from the tendency of these schooling species to be visible at the surface and vulnerable to fishers, even when abundance (or the number of remaining schools) is low.³ It follows that commercial

¹ Griggs, L., Bradford, E. Jones, B. Drummond, K. (1998) Growth and Movement of Tagged kahawai in New Zealand waters.

² Hartill, B. *et al.* (2002) Length and Age Composition of Recreational Landings of Kahawai in KAH 1 in 2000-01 and 2001-02.

³ Hilborn, R. & Walters, C.J. (1992) Quantitative Fisheries Stock Assessment. Choice, Dynamics and Uncertainty, Chapman and Hall, New York, at page 570.

catches, using modern purse-seine fishing methods are able to be maintained at high levels over a period of years as the stock is fished down.

- 5.18 The recreational kahawai catch is substantial, although the annual harvest is not accurately known. Further research in this area is planned or underway. The Ministry currently fund a project in KAH 1 (called KAH2003/01) to continue the collect information on the length and age of kahawai in the recreational catch and catch rates from fishers returning to boat ramps. The purpose of these boat ramp surveys is to obtain a representative sample of the kahawai population to help monitor the kahawai stock in this QMA.
- 5.19 The Ministry have also contracted NIWA to characterise the commercial and non-commercial fishery in New Zealand by assembling and summarising all available information (KAH2004/01). The Ministry did not commission this work earlier so that it was available prior to the introduction of Kahawai to the QMS.
- 5.20 The Ministry intend to invite tenders for three more kahawai projects in 2005. The first is a continuation of the stock monitoring of the recreational catch in KAH 1 and the second will monitor the commercial catch. These projects are based around sampling catch for age, length and catch rate information. The third project is a new kahawai stock assessment which may be available late in 2007.

6. Overview of the Fisheries Legislation

- 6.1 The following is intended to be a general overview of the legislation as it relates to:
- a. setting total allowable catches (TACs);
 - b. "allowing for" non-commercial interests and setting total allowable commercial catches (TACCs);
- under the Fisheries Act 1996 (the Act).
- 6.2 I set out this general overview to provide context to my analysis of the Minister's 2004 decision which follows.
- 6.3 The following discussion relates to the relevant provisions of the Fisheries Act 1996 as they were in force at the time of the Minister's 2004 decision (prior to 1 October 2004).

- 6.4 When a new species is introduced to the quota management system, the Minister is required to set total allowable catches (TACs) for each quota management area (QMA) under section 13 of the Act.
- 6.5 Total allowable catches (TACs) are intended to ensure the sustainability of fish stocks and are required to be set for each quota management area (QMA). Quota management areas (QMAs) are geographical areas defined by the Minister within which fish stocks are managed. The quota management areas for kahawai are KAH 1, KAH 2, KAH 3, KAH 4, KAH 8, KAH 10. These areas are depicted in Figure 3 on page 10 of the Minister's decision letter regarding stocks to be introduced into the Quota Management System on 1 October 2004.⁴
- 6.6 In fisheries management, a TAC is termed an output control, as it sets a direct limit on the total catch that can be taken out of the stock. Input controls indirectly limit catches by controlling fishing inputs to the fishery such as limiting the number of boats allowed to fish, when and where fishing is allowed, or the fishing methods used. As well as the requirement to set TACs, the Minister also had the discretion to implement other sustainability measures including input controls such as area restrictions, fish size or fishing method restrictions (see section 11(3) of the Act).
- 6.7 Once an initial TAC was set for each QMA, the Minister was required to set total allowable commercial catches (TACCs) for each QMA. This includes the ability to set the TACC at zero. In setting or varying each TACC, the Minister was required to "allow for" non-commercial fishing interests: Section 21 of the Act reads (in part):

"the Minister shall have regard to the total allowable catch for that stock and shall allow for –

- (a) *The following non-commercial fishing interests in that stock, namely –*
 - (i) *Maori customary non-commercial fishing interests; and*
 - (ii) *Recreational interests; and*
- (b) *All other mortality to that stock caused by fishing."*

⁴ Minister's decision letter regarding stocks to be introduced into the Quota Management System on 1 October 2004, dated 6 November 2003, at page 10. The quota management areas for kahawai are formally defined in the Fisheries (Declaration of New Stocks Subject to the Quota Management System) Notice (No 2) 2003.

- 6.8 Recreational and Maori customary fishers take their "allowances" within the constraints of daily bag limits, method restrictions and minimum legal sizes as set out in Regulations.
- 6.9 TACCs are distributed to eligible commercial fishers as individual transferable quota (ITQ). The first step in the allocation of ITQ to commercial fishers is the calculation of "provisional catch history". Commercial fishers are made eligible for provisional catch history by prescribed eligibility criteria. The main criterion is whether a commercial fisher held a fishing permit under section 63 of the Fisheries Act 1983 during either the 1990/91 or the 1991/92 fishing years.
- 6.10 Provisional catch history is calculated for each eligible commercial fisher in proportion to their catch history for their qualifying years, namely within the 1990/91 and 1991/92 fishing years.
- 6.11 Catch history are estimates of past catch measured in tonnes. For example, catch history for commercial fishers for the 1990/91 fishing year would be estimates of individual fishers' total catch in tonnes from 1 October 1990 to 30 September 1991.
- 6.12 Once provisional catch history is calculated and notified, the next step is to allocate commercial fishers with quota. The available TACC, which is a tonnage limit, is equated into 100,000,000 equivalent quota shares for each quota management area.
- 6.13 For new species introduced to the QMS in 2004, the Crown had to provide 20% of the TACC (20,000,000 shares) from each stock to the Treaty of Waitangi Fisheries Commission (the Commission) under section 44 of the Act. This was allocated to Maori commercial fishing interests as part of the settlement of fisheries claims set out in the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.
- 6.14 For kahawai, the compulsory 20% reduction for Maori necessitated a reduction in the quota issued to commercial fishers compared to their recent catch history. Special rules concerning the allocation of quota to commercial fishers applied to kahawai because it was listed in Schedule 4 to the Act.
- 6.15 If the provisional catch history for any QMA equated to more than 80,000,000 quota shares (80% of the TACC), the Chief Executive of the Ministry was required to allocate quota to commercial fishers under sections 50A – 50G. Section 50G required the Crown to pay

compensation to commercial fishers for the compulsory acquisition of 20% of the TACC for the Commission. For kahawai, compensation was required to be paid out to commercial fishers in relation to KAH 1, KAH 2 and KAH 3.

- 6.16 Ultimately, eligible commercial fishers received ITQ out of the residual 80% of the TACCs for each QMA in proportion to their catch history during their qualifying years.

Part B – The Minister's 2004 Decision to Set TACs

7. The Minister's 2004 decision

- 7.1 On 5 July 2004, the Minister made a decision to set initial total allowable catches (TACs) for kahawai for each quota management area (QMA) in relation to kahawai's introduction to the quota management system (QMS). I exhibit an extract from the Ministry of Fisheries' (the Ministry) combined FAP on all fish species to be introduced into the QMS on 1 October 2004 on which the Minister marked his decision in relation to kahawai on pages 535-536. I note that the Minister strictly followed the options provided by the Ministry in relation to all fish species [JH 1]. The Minister announced his decision by letter to stateholders dated 10 August 2004 [JH 2].
- 7.2 The Ministry advised the Minister in the lead up to the Minister's 2004 decision in an initial position paper (2004 IPP) dated 12 January 2004 and a final advice paper (2004 FAP) dated 29 June 2004. The 2004 IPP gave the Ministry's initial policy position and invited submissions from interested parties. The 2004 FAP considered the submissions received and gave the Ministry's final advice. The Final Advice Paper (2004 FAP) contained the Ministry's advice on the Minister's statutory obligations and policy guidelines, the initial position paper, and the Ministry's final advice. [JH 3].
- 7.3 The following is the relevant passage from the letter to stakeholders dated 10 August 2004 [JH 2].

"Setting TACs

5. *While a stock assessment indicated that by 1996 the biomass of kahawai had declined to around 50% of its original level it is unknown whether stocks are currently above or below the biomass that will support the maximum sustainable yield (Bmsy). In the absence of any information for determining a specific stock size as a target level or for gauging the required change in catch*

levels necessary to achieve any particular target level the matter of a target stock size is largely academic.

6. *Nevertheless, uncertainty in the status of current biomass is an important factor that I have taken into account in my consideration of TAC options identified in the MFish advice and in stakeholder submissions. The uncertainty in information needs to be considered as does the recreational (and some customary) submissions suggesting that the stocks have declined below acceptable levels. However, I am required to make decisions on TACs despite the uncertainty in current stock status. Having regard to the importance of the stock to all sectors, and therefore the socio-economic benefits associated with harvesting, I wish to take management steps that will at least maintain, if not improve, current biomass.*
7. *I have carefully considered the available information for setting TACs. There is a 1996 stock assessment for kahawai, historical commercial catch information and estimates of current use for all sector groups available.*
8. *I have noted that the 1996 stock assessment provides estimates of annual national yield ranging between 5100-14 200 tonnes. However, I note there is some agreement in submissions and the MFish advice for considering that the best available interpretation of annual yields from the 1996 stock assessment is either 6900, 7600 or 8200 tonnes. Some commercial and recreational submissions supported basing TAC decisions on these yields but differed on the level that should be chosen. The stock assessment is dated (1996) and the inputs into the assessment are increasingly regarded as being unreliable. Although relevant as a reference point for TAC setting, I have noted that there is considerable uncertainty associated with the 1996 stock assessment.*
9. *The alternative basis for setting TACs is to base them directly on the current use of the kahawai fishery (or a proportion of that use). This method has the advantage of reflecting public policy and other decisions already made for the fishery and the current reliance on the fishery by each sector. These considerations are reflected in the current management arrangements for the fishery and current catch. I have noted that some industry submissions supported adopting this option.*
10. *Kahawai is one of the fish species most frequently caught by recreational fishers. The best information on the level of the recreational catch is the diary harvest survey. The 1996 and 1999-00 recreational diary harvest surveys differed considerably. Technical experts have recently reviewed the available estimates of recreational catch. Based on new advice, the MFish considers that the most recent diary harvest surveys provide the best available information on current recreational catch levels. The 1999-00 (and 2000-01 rollover) recreational harvest survey indicated the kahawai catch level was substantially higher than the 1996 survey had indicated.*

11. *Kahawai supports important Maori customary fisheries, but the size of the catch is unknown and can only be estimated by assuming a proportion of the recreational catch.*
12. *The commercial catch declined after peaking in 1987-88, when purse seining was largely unconstrained. Catches during the past five years were relatively stable, compared with the previous ten year period.*
13. *Some submissions disputed the estimates of current utilisation provided in the IPP and suggested alternative data and/or time periods of data that should be used to calculate the TAC options. I have considered the MFish advice and the submissions relating to this issue. I have accepted the MFish rationale for the revised estimates of commercial average landings, revised estimates of recreational utilisation and of the customary utilisation and their use as a basis for the TAC options proposed. I am not so concerned about the basis for the TAC calculation but rather whether the overall TAC for each stock is sustainable.*
14. *I have examined two options for setting TACs, one based on current utilisation, the other based on a 15% reduction of both commercial and recreational utilisation.*
15. *In reaching a decision on which TAC option should apply in each kahawai management area I have carefully considered the Ministry FAP and the issues raised in submissions including:*
 - *the uncertainty in information on the status of kahawai stocks;*
 - *the agreement of sector groups for managing kahawai stocks above Bmsy;*
 - *my desire to at least maintain and hopefully improve current biomass;*
 - *the absence of any new stock assessment until at least 2006; and the*
 - *socio-economic information including the potential impacts and benefits to all sectors.*
16. *I am concerned about the state of kahawai stocks given that the combined estimates of recreational catch, customary catch, fishing-related mortality and reported commercial landings exceeds the best available yield estimates, based on the 1996 stock assessment. I note that these 1996 yield estimates are outdated and uncertain. However, they remain as a reference point of sustainable yield for kahawai.*
17. *I am also aware of the widespread perception of recreational fishers that there is a marked decline in the amount and size of kahawai available. While I recognise that anecdotal information is uncertain I consider these perceptions to be important given the size of the recreational fishery.*
18. *I am obliged by legislation to ensure that the overall TAC for each kahawai stock is sustainable. While accepting that the information on landings is uncertain, I consider that the available*



data suggests that there is a risk attached to the status of some kahawai stocks, in particular KAH 1, KAH 2, KAH 3 and KAH 8.

19. *Accordingly, I am not satisfied that setting TACs based on current utilisation in KAH 1, KAH 2, KAH 3 and KAH 8 appropriately mitigates the risk that abundance may have declined over time and further decline is possible at levels based on current catches. I consider that the TACs for these stocks should at least maintain and preferably provide for an increase in the kahawai biomass. I have therefore decided to set a TAC for kahawai in KAH 1, KAH 2 and KAH 8 that is 15% below revised estimates of current utilisation. TACs in other areas are to be based on conservatively derived, nominal values. TACs for all stocks are outlined in Table 1.*
20. *I am aware of and acknowledge the reduction in current use required to fit within TACs I have decided and note that these will have socio-economic impacts. However, given the clear importance of kahawai to all sectors I consider that ensuring sustainability of key stocks is of considerable importance. I would also expect to keep TACs under review as new information becomes available for the fishery.*

8. **Setting TACs under section 13 – the decision for making framework**

- 8.1 The Minister was required to set TACs for each quota management area under section 13 of the Act.
- 8.2 The term "sustainability measure" is defined in the interpretation section and refers to measures under Part 3 for the purpose of ensuring sustainability. This term is itself referred to in s.8 in the context of the purpose of the Act being "to provide for the utilisation of fisheries resources while ensuring sustainability". I refer to the meaning in s.8(2):

"s.8(2) In this Act –

"Ensuring sustainability" means—

- (a) *Maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and*
- (b) *Avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment:..."*

- 8.3 The setting of TACs is a "sustainability measure" designed to limit annual fishing mortality so that stocks are fished at sustainable levels. Under section 13, TACs are required to be set so that the stock in each QMA is maintained at or above a biomass level that can produce maximum sustainable yield. Section 13 reads (in part):

"... the Minister shall, by notice in the Gazette, set in respect of the quota management area relating to each quota management stock a total allowable catch for that stock, and that total

allowable catch shall continue to apply in each fishing year for that stock unless varied under this section...

(2) *The Minister shall set a total allowable catch that—*

(a) ***Maintains the stock at or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks;***
[Emphasis added]

8.4 Maximum sustainable yield (MSY) is the theoretical maximum fishing mortality that can be sustained by a stock. It is usually calculated as an annual harvest in tonnes. The 1996 Act defines "maximum sustainable yield" as:

"...the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the population dynamics of the stock and any environmental factors that influence the stock."

8.5 The biomass of a stock that will produce maximum sustainable yield (MSY) is known as B_{MSY} . The Minister is required to set TACs that will maintain stock levels in each QMA at or above B_{MSY} .

8.6 In theory, the Minister would be expected to decide upon target biomass levels *at or above* B_{MSY} for each QMA, and to set TACs that move the biomass in each QMA towards those target levels.

8.7 In most fisheries, MSY is produced when a stock is fished down to about 20% of the unfished stock size (the biomass of an unfished stock is known as its virgin biomass). This is because the population structure of a stock changes in the first years of large scale fishing. Large old fish that are numerous in an unfished stock are removed and replaced by faster growing young fish. As more space and resources become available for juveniles and fast growing young fish, the annual increase in biomass contributed by growth and recruitment increases. It may seem a little counterintuitive but a fish stock produces a higher annual sustainable yield as the stock is fished down. If fished hard enough the stock will reach the biomass that will support MSY (B_{MSY}) which is generally around 20% of the biomass of the unfished stock (virgin biomass).

8.8 A stock becomes "over fished" when the stock is depleted by fishing to a point where it can not maintain its reproductive potential (recruitment over fishing) or when the fishery catches mainly young fish before they have a chance to grow (growth over fishing).

- 8.9 The general principles of the Act also apply to TAC setting, particularly the stated purpose of the Act in section 8. The Ministry summarised these principles at paragraph 30 of the introduction to the FAP:

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

9. The information used to set TACs

The requisite information under section 13

- 9.1 The Minister is heavily reliant on the Ministry to provide certain scientific information in order to set appropriate TACs to achieve target biomass levels at or above B_{MSY} .
- 9.2 In order to set TACs at or above B_{MSY} , as set out in section 13, the Minister ideally needs:
- a. An estimate of current stock size (biomass) for each quota management area;
 - b. An estimate of a stock level that can produce MSY for each quota management area (B_{MSY});
 - c. Estimates of the TACs that would move the biomass of kahawai stock in each QMA towards target biomass levels;
 - d. The time period over which the estimates of the TACs would rebuild or reduce the biomass of each quota management stock towards target levels;
- 9.3 For many species, this information can be generated from modern stock assessment models. For example a stock assessment may determine that a 25% rebuild is required to shift the current stock size to the target biomass *at or above* B_{MSY} . The Minister would then decide on the TAC that would rebuild the fishery over a period of time based on projections derived from the stock assessment model.

The absence of the necessary information on kahawai

- 9.4 For kahawai the Ministry could not provide the Minister with the information needed to set TACs to achieve target biomass levels at or above B_{MSY} with any real certainty.

- 9.5 The Ministry provided advice based on two reports on kahawai “stock assessment” titled “*Preliminary Simulation Modelling of Kahawai Stocks*”⁵ and “*Update of kahawai simulation model for the 1997 assessment and sensitivity analysis*”.⁶ The estimates derived from this modelling are highly sensitive to some of the assumptions made about kahawai biology and catch. Normally, stock assessments are fitted to an index of the change in stock size over time (an index of relative abundance). Unfortunately no agreed index of kahawai stock size was available. The 1996 “stock assessment” is more accurately described as a simulation model that provides a range of possible estimates of MSY for all kahawai quota management areas combined. That is, combined overall estimates of MSY at a national level. It does not provide detailed information for each kahawai QMA, namely KAH 1, KAH 2, KAH 3, KAH 4, KAH 8, KAH 10.
- 9.6 The author of the simulation model reports relied on by the Ministry, Dr Elizabeth Bradford, did not necessarily believe that kahawai formed a single national stock. Dr Bradford explained that the 1996 simulation model treated kahawai as one stock:

*“Because of the difficulty in estimating immigration and emigration from the kahawai fishstocks as they are defined”*⁵

- 9.7 The Minister decided in 2003 to introduce kahawai to the QMS and to manage the species as six separate stocks by adopting six QMAs. MFish advice at the time was that separate QMAs were needed because of the fishery characteristics and the need to manage for multiple sector interactions. The 1996 “stock assessment” was a first look at modeling the population based on existing general biological knowledge of kahawai and an estimated catch history. It produced national harvest estimates that were considered “ball park” by Dr Bradford. It also started the process of looking at what new information could be collected in the future. Eventually a project to monitor the kahawai stock by measuring and aging fish caught by recreational fishers was started in 1999.

⁵ Bradford, E. (1996) Preliminary Simulation Modelling of kahawai Stocks.

⁶ Bradford, E. (1997) Update of kahawai Simulation Model for the 1997 Assessment and Sensitivity Analysis.

- 9.8 In the 2004 FAP, the Ministry acknowledged the lack of information to set TACs to achieve target stock levels at or above B_{MSY} saying (at paragraph 38):

"In this case the MFish is not able to provide quantitative estimates for any stock and management above B_{MSY} becomes a largely theoretical exercise. In the absence of this information the MFish considers that a target level for kahawai stocks is not a crucial issue to determine at this time. Rather, you should consider the socio-economic benefits at various stock sizes in relation to the TAC options proposed for consideration."

- 9.9 The Minister gave a similar acknowledgment at the beginning of his stakeholder letter by saying (in paragraph 5):

"...it is unknown whether stocks are currently above or below the biomass that will support the maximum sustainable yield (B_{msy}). In the absence of any information for determining a specific stock size as a target level or for gauging the required change in catch levels necessary to achieve any particular target level the matter of a target stock size is largely academic."

Setting TACs in the absence of the necessary information

- 9.10 Pursuant to the Act's information principles (contained in section 10), the Minister must set TACs despite the absence of the information needed to set TACs at or above B_{MSY} . Section 10 reads:

"10. Information principles—

All persons exercising or performing functions, duties, or powers under this Act, in relation to the utilisation of fisheries resources or ensuring sustainability, shall take into account the following information principles:

- (a) Decisions should be based on the best available information:*
- (b) Decision makers should consider any uncertainty in the information available in any case:*
- (c) **Decision makers should be cautious when information is uncertain, unreliable, or inadequate:***
- (d) The absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of this Act."*

[Emphasis added]

- 9.11 The Minister could not use the absence of the scientific information ideally needed to set TACs to achieve target biomass levels at or above B_{MSY} as a reason for failing to set TACs to achieve the purpose of the Act. However, in this circumstance the decision-maker is required to be

cautious, and take into account basing decisions on the best available information.

- 9.12 At paragraph 6 of the decision, the Minister acknowledged the need to set TACs despite uncertainty in the current stock status:

"I am required to make decisions on TACs despite the uncertainty in current stock status"

- 9.13 The Minister was required to use the "best available information". The definition of "information" in the Act reads:

"Information" includes—

- (a) Scientific, customary Maori, social, or economic information; and*
- (b) Any analysis of any such information."*

- 9.14 The "best available information" is defined in the Act as:

"Best available information" means the best information that, in the particular circumstances, is available without unreasonable cost, effort, or time"

- 9.15 TACs are described as a "sustainability measure" under Part 3 of the Act and are intended to limit catches in each QMA to ensure sustainable levels of fishing. "Ensuring sustainability" is part of the purpose of the Act, as is "utilisation". The purpose of the Act is stated in section 8, it is:

8. Purpose

*"(1) The purpose of this Act is to provide for the **utilisation** of fisheries resources **while ensuring sustainability**.*

(2) In this Act—

"Ensuring sustainability" means—

- (a) Maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and*
- (b) Avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment:*

"Utilisation" means conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing." [Emphasis added]

- 9.16 It is my opinion that in the absence of the information needed to set TACs to maintain kahawai stock levels at or above B_{MSY} , the Minister was required to carry out an evaluation of the sustainability of kahawai catch in each QMA. Various information was available to the Minister and the Ministry (without unreasonable cost, effort or time) that would have allowed the Minister to better determine whether catch levels in each QMA were sustainable. I refer to this information, in relation to KAH 1, KAH 2, KAH 3 and KAH 8 specifically in the Appendix to this affidavit at paragraph 23 below.

9.17 In my view the Minister needed to consider the existing management of kahawai in each QMA and whether those measures were effective. This is fundamental baseline information when considering any initial fisheries management decision under the QMS. There are a number of reports produced by or for the Ministry that describe the trends in commercial catch, changes in recreational catch rate and changes in kahawai size over time. Recreational fishers in many QMAs had been complaining of serious reductions in the size and availability of kahawai since the 1980s. While this information from recreational fisheries had not been collected as part of scientific research into the fishery, it is information suggesting that there were real sustainability issues that needed to be addressed. Some QMAs have been the subject of strong and regular expressions of concern by recreational fishers, especially in KAH 1, 2, and 3.

10. **The information presented to the Minister by the Ministry**

10.1 In the absence of the information needed to set TACs under section 13, three main sources of information for TAC setting were presented to the Minister in the IPP and the FAP. They were:

- a. The 1996 "stock assessment";
- b. Historical commercial catch limits;
- c. Estimates of current "utilisation" (based on catch history).

10.2 In addition, social, cultural and economic factors and "*Other Sources of Information*" were also the subject of advice by the Ministry in an Appendix to the 2004 FAP.

10.3 As I explain below, the Ministry had an express policy preference for using catch history as the basis for setting TACs. In my view the Ministry's consideration of the available information was directed towards an outcome which reflected this policy preference to the exclusion of other available information showing the poor state of the non-commercial fishery.

10.4 The following is my analysis of the Ministry's advice on the information presented to the Minister, namely the:

- 1996 "stock assessment";
- Commercial catch limits;

- Social economic and cultural matters; and
- Other sources of information – submissions to the IPP.

The 1996 "stock assessment"

10.5 In the 2004 IPP, the 1996 kahawai "stock assessment" was discussed first (at paragraphs 10 – 12). The Ministry stated that (at paragraph 10):

"Estimates of virgin and 1996 biomasses, and an estimate of maximum constant yield (MCY) for a single nationwide kahawai stock are available."

- 10.6 The Ministry note that the 1996 "stock assessment" was based on the assumption of a single nationwide kahawai stock but do not advise the Minister about the basis for that assumption, and the limitations and risks it carries in translating this information into each QMA.
- 10.7 As stated earlier, when the Ministry refer to the 1996 "stock assessment", this is referring to the 'Preliminary Simulation Modelling of Kahawai Stocks'.⁷ a draft report by Dr Elizabeth Bradford in 1996 and a follow up report 'Update of Kahawai Simulation Model for the 1997 Assessment and Sensitivity Analysis'.⁸ Neither of those reports purport to be a complete stock assessment of kahawai.
- 10.8 The maximum constant yield (MCY, a specific measure of MSY) figures used by the Ministry in the 2004 IPP and 2004 FAP come from the 1997 report. This produced MCY estimates that range from 4,100 tonnes to 14,600 tonnes. There was no index of kahawai abundance to base a stock assessment on. The simulation model is based on an assumed upper bound on total mortality which is highly uncertain. If the upper bound chosen had been higher or lower the estimates of MCY would correspondingly have been higher or lower.
- 10.9 The lack of certainty in the Bradford simulation modelling was acknowledged in the Ministry's advice to the Minister. At paragraph 12, the 2004 IPP said:

"There is uncertainty about the level of current biomass levels and the applicability, for setting current yields, of using the 1996 stock assessment. This is because the assessment is not only uncertain but also some seven years out of date."

⁷ Bradford, E. (1996) Preliminary Simulation Modelling of kahawai Stocks.

⁸ Bradford, E. (1997) Update of kahawai Simulation Model for the 1997 Assessment and Sensitivity Analysis.

- 10.10 The Ministry re-emphasised the uncertainty in the Bradford simulation modelling at paragraph 61 of the 2004 FAP, saying:

"As noted in this paper and in the IPP, there is considerable uncertainty regarding the historic stock assessment, which is now six years out of date."

- 10.11 The Minister accepted that the Bradford simulation modelling was uncertain and out of date. The Minister says at paragraph 8 of his stakeholder letter:

"The stock assessment is dated (1996) and the inputs into the assessment are increasingly regarded as being unreliable. Although relevant as a reference point for TAC setting, I have noted that there is considerable uncertainty associated with the 1996 stock assessment."

- 10.12 The Minister stated that he considered the estimates from the Bradford simulation modelling as a reference point for the maximum sustainable yield for combined TACs (see paragraph 16 of the Minister's stakeholder letter).

- 10.13 It is unclear to me how the national estimates of sustainable yield influenced the decisions in each QMA. Even if the assessment had been more certain, it would not have helped determine the MSY or TACs for each QMA unless there was clear evidence that kahawai formed a single national stock, with free mixing and relatively uniform distribution between QMAs. As stated previously, in my view, the results of tagging studies (sections 5.11 to 5.13 above) together with evidence of kahawai depletion in some regions do not support the assumption of a single national stock for the purposes of fisheries management.

- 10.14 The Minister's decision assumes a single national stock. In my opinion, one of the consequences of assuming a single national stock, and setting TAC's on an assumed national basis, is that addressing the sustainability of kahawai in each regional stock or individual QMA has, in effect been discounted. I elaborate on this at paragraph 15 below.

Social, cultural and economic factors

- 10.15 The 2004 IPP and the 2004 FAP also referred to social, cultural and economic factors as being relevant to TAC setting. In the context of setting the TAC for particular QMAs section 21(3) provides that "the Minister shall have regard to such social, cultural and economic factors as he or she considers relevant". These factors are also relevant to

issues of "utilisation" and "ensuring sustainability" in section 8(2) where there is also reference to the "reasonably foreseeable needs of future generations".

10.16 Annex 2 of the 2004 IPP (at paragraphs 126 – 130) discussed an economic survey which estimated the value of kahawai to recreational fishers and annual expenditure on five key species. The South Australian Centre for Economic Studies estimated the annual recurrent expenditure of recreational fishers targeting kahawai to be \$152 million.⁹ The authors (and the Ministry) recommend caution when using these estimates as they are based on a number of assumptions about the targeting of kahawai by fishers, that the boat ramp survey was a representative sample, and the total number of active recreational fishers in New Zealand.

10.17 The 2004 FAP included an evaluation of the economic impacts of various suggested TACCs on commercial fishers (at paragraphs 246-274).

10.18 However neither the 2004 FAP or the 2004 IPP discussed the social, cultural and economic impacts of suggested TACs, TACCs or allowances on non-commercial fishers. The 2004 IPP did note (at paragraph 21) that:

"Recreational interests are most likely to be served by stocks maintained above B_{MSY} ..."

10.19 Paragraph 15 of the Minister's stakeholder letter stated that the Minister had considered the Ministry's FAP carefully and the issues raised in submissions including:

"socio-economic information including the potential impacts and benefits to all sectors."

10.20 There is also a brief reference to "socio-economic "impacts" in paragraph 21 of the decision. But this related particularly to the potential of catch reductions on commercial operations. However, no evaluation of the social, cultural and economic factors relevant to non-commercial fishers is apparent to me in the Minister's 2004 decision. For instance, at no point does the Ministry advise the Minister on how a 15% reduction in the recreational allowance might affect daily bag limits and the

⁹ South Australian Centre for Economic Studies (1999) Value of New Zealand Recreational Fishing.

consequential impact on non-commercial fishers who fish for sustenance. Although raised in submissions, at no point does the Minister consider the social and cultural value of having visible surface schools of kahawai as a regular feature of our seascape.

Other Sources of Information – Submissions to the 2004 IPP

10.21 The Minister records that there were “*sixty-eight written submissions, 1790 emails and 1668 form petitions received to the IPP*” (paragraph 2, Minister’s decision). The 2004 FAP discussed some of these submissions to the 2004 IPP (under the heading “*Other Sources of Information*” at paragraphs 65 -71 and in more detail in Annex 1 at paragraphs 329-358 of the FAP).

10.22 The Ministry stated that the “*Other Sources of Information*” were not definitive. At paragraph 68, the 2004 FAP said:

“None of the other sources of information presented in Appendix 1 is definitive with regard to determining recent trends in the stock and the current state of the kahawai biomass.”

10.23 As I discuss in more detail below, in my opinion the “*Other Sources of Information*” included scientific information and other valid information that could have been used to assist the Minister to understand the current status (size) of kahawai stocks and whether TACs proposed in each QMA would ensure sustainability, particularly in KAH 1.

10.24 The Minister’s 2004 decision itself did not discuss any of the other information submitted to the 2004 IPP, except in noting that (at paragraph 17):

“...the widespread perception of recreational fishers that there is a marked decline in the amount and size of kahawai available.”

10.25 In response to submissions to the 2004 IPP, the Ministry identify the large peak in commercial fishing from the late 1980s to 1991 or thereabouts. The Ministry note the strong concern “in a considerable volume of submissions”, but reject claims by the non-commercial fishers that the fishery has been “depleted” by the effects of commercial fishing (see paragraph 118 2004 FAP).

10.26 As I set out below at paragraph 15, in my opinion, the Ministry’s evaluation of this does not properly take into account the information of catch rates and sustainability concerns within each individual QMA. Again the assumption of a single national stock fails to consider the

regional differences in stock levels that are reflected by regional concerns about kahawai abundance within each QMA. The Ministry's rejection of the large number of submissions to the 2004 IPP that kahawai catch rates have declined significantly appears to be based on a limited comparison drawn from recreational surveys which only started in 1991 (see paragraph 349 2004 FAP). This fails to consider the effect on the quality of recreational fishing caused by large purse seine catches prior to that time.

10.27 A number of submissions (eg. section 5.6 of submission from Non-commercial Fishers) stated that by 1991 the recreational fishery was in a very poor state - so poor that the Minister at the time imposed catch limits on purse seine as an interim measure to try and halt the decline (refer also to the affidavit of Kim Walshe). In my opinion, what the survey data referred to by the Ministry (see paragraph 349 2004 FAP actually shows is that the recreational fishery in many areas has not improved since 1991, even under a regime of declining commercial catch limits which remained in place until kahawai were introduced into the QMS.

11. **Current catch - the Ministry's policy preference**

11.1 Predominantly, the 2004 IPP and the 2004 FAP focussed on the purported advantages of basing TACs solely on combined estimates of current catch, which the Ministry sometimes referred to as current "*utilisation*" or current "*use*".

11.2 Throughout the 2004 IPP and the 2004 FAP, the Ministry uses the terms current "*utilisation*" and current "*use*" to describe estimates of current catch.

11.3 At paragraph 16 of the 2004 IPP, the Ministry stated their policy preference for basing the TACs on current catch, saying:

"In the absence of a stock assessment, MFish preferred policy is to use current utilisation as a basis for determining [the] TACs..."

11.4 The 2004 FAP discussed various ways of estimating current catch at length (in paragraphs 72 -108), which resulted in revised estimates of current catch. From the 2004 IPP to the 2004 FAP, the overall estimate of current catch for all sectors combined increased by 15% because of revised estimates of commercial and recreational catches.

- 11.5 Later in the 2004 FAP, the Ministry repeated its policy preference and provided the Minister with its two preferred TAC options, both of which base proposed TACs on current catch. The 2004 FAP repeated at both paragraphs 152 and 319:

"The MFish preferred TAC options are to either base combined TACs on current utilisation or an arbitrary 15% reduction in recreational and commercial use of key kahawai stocks (KAH 1, KAH 2; KAH 3 and KAH 8)."

- 11.6 The Ministry determined that the revised level of current national catch was 8757 tonnes according to the best available information at the time of the FAP. With an arbitrary 15% reduction to recreational allowance and commercial TACC, this equated to an overall TAC of 7612 tonnes (see Table 12 above paragraph 325 of the FAP). This was almost the same as the estimate of overall *current* catch of 7626 tonnes given in the 2004 IPP (see paragraphs 19 and 25-30 of the IPP).

- 11.7 In the conclusion section of the 2004 FAP, the Ministry summarised its position to the Minister by saying (at paragraphs 310 – 312):

310. *For the purposes of setting TACs two approaches are available:*

- a. *Using estimates of yield from the 1996 stock assessment model; and*
- b. *Using estimates of current use of the fishery (or a proportion of that use).*

311. *... MFish considers that the stock assessment information is too uncertain and dated for using as a basis for setting TACs.*

312. ***The alternative is to base TACs directly on current utilisation of the fishery.*** [Emphasis added]

- 11.8 Both options proposed by the Ministry in the 2004 FAP based TACs for each QMA on estimates of current catch.

12. **Current catch estimates are based on Catch History**

- 12.1 The estimates of current catch proposed by the Ministry were based on catch history data for both the commercial and recreational sectors of the fishery.

- 12.2 The estimate of current catch for the commercial sector was based on catch history information for each quota management area for the five year period from 1997/98 – 2002/03 (see paragraph 75 of the 2004 FAP). Revision of the commercial catch figures in the 2004 FAP increased the overall estimate of commercial current catch in the 2004 FAP by 7% compared to the IPP.

- 12.3 Recreational current catch in the 2004 FAP was based on catch history estimates from the national recreational harvest survey conducted in 1999/00 and a follow up survey carried out in 2000/01 (see paragraph 97 of the 2004 FAP). In the 2004 IPP the average of the 1996 and 1999/00 national recreational harvest survey estimates was used. The Ministry state that the more recent survey estimates constitute the best available information, although they may be high for some important fish stocks. For KAH 2 and KAH 3 the results of the follow on survey in 2000/01 were used as they were lower than 1999/00. The result was the estimated current recreational catch increased substantially from 2780 tonnes in the 2004 IPP to 4015 tonnes in the 2004 FAP (an increase of 44%).
- 12.4 The customary Maori current catch was estimated in the 2004 FAP at 25% of estimates of recreational current catch (see paragraph 107 of the 2004 FAP). In the IPP, the customary current catch had earlier been estimated at 50% of recreational current catch. The result of this decision is that the estimate of current catch for the Maori customary fishery ended up significantly lower than would have otherwise been the case.
- 12.5 The revision of current catch estimates in the 2004 FAP resulted in the overall combined sector estimates of current catch increasing from 7626 tonnes to 8757 tonnes (an increase of 15% from the 2004 IPP). However, if the Ministry had not reduced its estimate of the customary Maori catch as noted above, the combined sector estimates of current catch would have been over 9200 tonnes (an increase of more than 20% from the estimate in the 2004 IPP).
- 13. The Minister's 2004 decision to set TACs based on current catch – arbitrary 15% reduction of current catch**
- 13.1 The topic of setting TACs is discussed in the 2004 FAP commencing at para 123. The following extract from para 152 of the 2004 FAP is instructive:
- 152. The MFish preferred TAC options are to either base combined TACs on current utilisation or an arbitrary 15% reduction in recreational and commercial use of key kahawai stocks (KAH 1, KAH 2, KAH 3 and KAH 8)...*
- 13.2 In the absence of the information needed to set TACs under section 13, the Minister's 2004 decision cited the three main sources of information

presented as available by the Ministry in the IPP and the FAP. At paragraph 7 of his stakeholder letter, the Minister said the following information was available:

- a. A "1996 stock assessment for kahawai";
- b. "Historical commercial catch information"; and
- c. "Estimates of current use for all sector groups".

13.3 The only options considered by the Minister were the two options preferred by the Ministry's advice in para 152 of the 2004 FAP. This is apparent at paragraph 14 of the stakeholder letter where the Minister states:

"I have examined two options for setting TACs, one based on current utilisation, the other based on a 15% reduction of both commercial and recreational utilisation."

13.4 The Minister perceived a risk that kahawai abundance may have declined because:

- The overall combined catch of commercial and non-commercial fishers and fishing related mortality now exceeded the national maximum sustainable yield estimate of 7600 tonnes (see paragraph 16 of the Minister's stakeholder letter);
- The Minister was "aware of the widespread perception of recreational fishers that there is a marked decline in the amount and size of kahawai available" (see paragraph 17 of the Minister's stakeholder letter).

13.5 The Minister then stated at paragraph 19 that:

"I am not satisfied that setting TACs based on current utilisation in KAH1, KAH 2, KAH 3 and KAH8 appropriately mitigates the risk that abundance may have declined over time and further decline is possible at levels based on current catches."

13.6 Accordingly, the Minister decided to take the 15% proportional reduction option. At paragraph 19, the Minister said:

"I have therefore decided to set a TAC for kahawai in KAH 1, KAH 2, [KAH 3] and KAH 8 that is 15% below revised estimates of current utilisation. TACs in other areas are to be based on conservatively derived, nominal values."

13.7 The reduction meant that TACs for KAH 1, KAH 2, KAH 3 and KAH 8 were set using an arbitrary 15% reduction of recreational and commercial current catch combined with Maori Customary estimates

and other sources of mortality. The TACs for KAH 4 and KAH 10 were set at nominal figures. Although the Minister does not state any reasons for using the 15% figure, the overall "reduction" of 15% from the revised estimates of current catch levels meant that the TACs set by the Minister were very similar to the original estimates of overall current catch given in the 2004 IPP (see paragraphs 19 and 25-30 of the 2004 IPP).

14. The reasons for basing TACs on current catch

- 14.1 The Ministry identified reasons in support of its advice to base the TACs on catch history at paragraph 312 of the 2004 FAP, saying:

"This method has the advantage of reflecting public policy considerations already made for the fishery and current reliance on the fishery by each sector. These considerations are reflected in the current management arrangements for the fishery and current catch."

- 14.2 The Minister adopted the Ministry's reasons for basing TACs solely on catch history, saying (at paragraph 9 of the stakeholder letter):

*"The alternative basis for setting TACs is to base them directly on the current use of the kahawai fishery (or a proportion of that use). **This method has the advantage of reflecting public policy and other decisions already made for the fishery and the current reliance on the fishery by each sector.** These considerations are reflected in the current management arrangements for the fishery and current catch."* [Emphasis added]

- 14.3 The Minister, having adopted the advice of the Ministry, identified the same factors as the Ministry in support of basing the TACs on catch history (at paragraph 9 of the Minister's 2004 decision). The reasons given for basing TACs on catch history were that it "has the advantage of ":

- a. reflecting public policy;
- b. reflecting other decisions already made for the fishery; and
- c. reflecting the current reliance on the fishery by each sector.

- 14.4 The "decisions already made for the fishery" are somewhat unclear to me. The major kahawai management decisions already made for the fishery were the commercial catch limits that had been in place since the 1990/91 fishing year, the inclusion of kahawai to schedule 4 of the Act, and the provision of a 20% share to Maori commercial fishers.

- 14.5 The "public policy" the Minister referred to may have been a reference to the policy of issuing quota rights on the basis of catch history.

- 14.6 Aside from those factors, the only other quality that the Ministry and the Minister have identified in catch history information was that it had the advantage of reflecting the "*current reliance on the fishery by each sector*".
- 14.7 The reference to "*reliance on the fishery by each sector*" and the arbitrary 15% reduction across catch estimates for each recreational and commercial sectors across all QMAs suggests in my opinion that an underlying reason for using catch history for setting TACs, was that this facilitated the distribution of fishing rights between sectors based on existing proportions of catch.

15. **Setting TACs for each quota management area**

- 15.1 The Minister perceived a risk to kahawai stocks in KAH 1, KAH 2, KAH 3 and KAH 8 but based the TACs *in each QMA* solely on catch history and applied a 15% reduction equally across all QMAs without any clear explanation of its rationale. This "one size fits all" approach is problematic because the Minister does not address sustainability of stocks within individual QMAs, particularly in KAH 1 and the Hauraki Gulf. The Minister applied the "*15% reduction*" to KAH 1, KAH 2, KAH 3 and KAH 8 uniformly with the apparent assumption that the sustainability concerns are the same in each of those QMAs.
- 15.2 The Minister does note that sector groups agree that stocks should be managed at a size above B_{MSY} (paragraph 15 of the Minister's 2004 decision).
- 15.3 A national estimate of maximum sustainable yield (7600 tonnes) from the mid-point of the Bradford simulation model of kahawai in 1996 was used as a reference point for a combination of all kahawai TACs. As it was a national estimate of maximum sustainable yield, it was not necessarily appropriate to use it in relation to each QMA.
- 15.4 While the Minister acknowledges the need to ensure TACs for each QMA are sustainable (paragraph 18), in actuality the Minister based the TACs in each QMA solely on catch history. In my view this has been done without undertaking any apparent evaluation of sustainability concerns expressed by recreational representatives and IPP submitters in relation to individual QMAs.
- 15.5 The Minister could have reasonably considered the available data on, for example, recreational catch rates by QMA or the size of kahawai in

the recreational catch, when deciding on the nature of the management action required for each area, especially if the agreed goal is to manage stocks above B_{MSY} .

- 15.6 Even if the estimate of the "national" maximum sustainable yield was correct, there are major differences in the distribution of commercial and recreational catch and effort between QMAs. For example, the distribution of purse seine fishing effort for kahawai has varied from area to area and purse seine vessels have moved out of KAH 3. The Ministry's advice to the Minister gave no apparent consideration to the differences between QMAs and their relative ability to sustain the TACs proposed.
- 15.7 Rather than setting TACs to address sustainability concerns in each QMA, basing TACs solely on catch history concentrates catch allowances in the QMAs that have experienced the greatest fishing pressure in the past. In high use QMAs, this risks exacerbating sustainability concerns, while in low use QMAs kahawai may be relatively more abundant.
- 15.8 KAH 1 is a particularly good example. As I explain in the Appendix to this affidavit, there was good information readily available evidencing strong sustainability concerns in KAH 1. Recreational catch rates are low throughout KAH 1, and the catch rate and size are especially low in the Hauraki Gulf.
- 15.9 Basing TACs solely on catch history had the effect of concentrating catch allowances inside KAH 1 (the smallest QMA by size). The TAC for KAH 1 was set on the basis of catch history at 3685 tonnes, which is 48% of all the total kahawai TACs of 7612 tonnes.
- 15.10 I believe that a range of information was reasonably available to the Minister for each QMA which would have enabled an individual sustainability assessment of each QMA, rather than simply basing TACs solely on catch history. Other information the Minister could have taken into account when evaluating non-commercial interests in each QMA prior to setting TACCs include the following:
- Fish size;
 - Time taken to catch fish;
 - Historic reliance;

- Other measures of trends in fish availability, in each QMA;
- The relative value of kahawai to each sector.
- The rationale for pre-QMS management measures;
- Indications of the effectiveness of pre-QMS management;
- Evidence of regional depletion;
- The relative size of QMAs;
- The distribution of fishing effort (and fishing method) across QMAs;
- Direct observations of experienced fishers.

15.11 There was no apparent consideration of how the TACs set may affect important regional fisheries for non-commercial fishers. In fact, the Ministry's advice to the Minister is that under the QMS spatial conflicts (involving both commercial and recreational fishers targeting species in the same geographic area) is a matter for the stakeholders to work out between themselves (at paragraph 286 in the 2004 FAP):

"While there is a need for a review of spatial management arrangements for kahawai in the near future, MFish considers that spatial arrangements are matters for stakeholders to address."

15.12 Since the purse seine vessels left KAH 3 the main areas of spatial conflict are in KAH 1. If the TAC in KAH 1 is set on the basis of catch history at a level that continues to suppress or further reduce the stock size, then in my view any spatial arrangements resolved between the stake holders themselves will largely be ineffectual. They will not result in the restoration of the quality of recreational and customary kahawai fisheries in KAH 1.

Part C: The Minister's 2004 Decision to "Allow For" Non-Commercial Interests and Set the TACCs

16. The Minister's 2004 decisions

16.1 On 10 August 2004, the Minister communicated his decisions to set total allowable commercial catches (TACCs) and to "allow for" non-commercial interests in kahawai. The Minister is required to set TACCs for each QMA. In setting or varying any TACC for any quota management area, the Minister is required to "allow for" non-commercial fishing interests: Section 21 (1) of the Act reads:

" In setting or varying any total allowable commercial catch for any quota management stock, the Minister shall have regard to the total allowable catch for that stock and **shall allow for** –

(a) The following non-commercial fishing interests in that stock, namely –

(i) Maori customary non-commercial fishing interests; and

(ii) Recreational interests; and

(b) All other mortality to that stock caused by fishing."

[Emphasis added]

16.2 This section of my affidavit is an analysis of the Minister's 2004 decision to set TACCs and to "allow for" non-commercial interests. The following is the passage of the Minister's 2004 stakeholder letter in which the Minister gave reasons for setting the TACCs and making provision for non-commercial fishing interests in each quota management area.

"Allowances and TACCs

21. *There are a number of competing demands for the available yield from kahawai stocks. This was clearly apparent from submissions. I recognise that there will be socio-economic impacts from making allowances and setting TACCs. I have noted in particular the potential of catch reductions on commercial operations that rely on kahawai as an integral component of their annual catch mix. I have carefully considered these impacts in coming to a decision. I have examined options for increasing the value to society from allocation decisions. However, in the case of kahawai, given the uncertainty in the available information I believe that the information on current use provides the best basis for allocating between each interest group. Accordingly I have decided to set allowances and TACCs that reflect current use in the fishery, reduced proportionally to fit within the bounds of the TAC set to ensure sustainability. My decisions on allowances for kahawai are outlined in the Table 1 below.*

Table 1: A copy of the table of TACs, allowances and TACC from the Ministers 2004 decision letter.

TACs, allowances and TACCs for kahawai. Stock	TAC	Customary Allowance	Recreational Allowance	TACC	Fishing related incidental mortality
KAH1	3685	550	1865	1195	75
KAH2	1705	205	680	785	35
KAH3	1035	125	435	455	20
KAH4	16	1	5	10	0
KAH8	1155	125	425	580	25
KAH10	16	1	5	10	0

17. Ministry advice for allocating the TACs on the basis of catch history

17.1 The Ministry has a stated policy preference of basing the allocation of the TAC between fishing sectors on the basis of catch history. The Ministry advised the Minister of two approaches for addressing the competing demands on the kahawai fishery. The two approaches were (see paragraph 181 of the 2004 FAP):

- a. A claims based model (a catch history model); or
- b. A utility based model.

17.2 The claims based model operates such that fishing rights are distributed on the basis of catch history. The Ministry described the claims-based approach as follows (at paragraph 181 of the 2004 FAP):

"A claim-based allocation describes a situation where allocations are made on the basis of a consideration of the legitimacy of claims to the resource. Generally these claims are based on some form of present or historical association with the resource, giving rise to expectations on the part of fishers (or classes of fishers) with respect to on-going future involvement;"

17.3 The Ministry described the utility-based approach as follows (at paragraph 181 of the 2004 FAP):

"A utility-based allocation describes a situation where allocations are based on the utility (or quantum of well being) that would flow from a particular allocation. This method tends to favour allocations to those who value the resource most (downplaying the importance of past associations with the resource). As such it tends to have a focus on the present rather than the past."

17.4 In the 2004 IPP, the Ministry stated its policy preference for using a catch history allocation model in shared fisheries, saying (at paragraph 33):

"In shared fisheries MFish has a policy preference in favour of the catch history allocation model in the absence of clear information to the contrary."

17.5 At paragraph 200 of the 2004 FAP, the Ministry repeated its policy preference in favour of the catch history model, saying:

"MFish considers that catch history information is a more certain basis for allocation than utility and has a policy preference for its use. Utility information for kahawai is uncertain. You should weight this uncertainty if you consider the use of utility information as a basis for allocations for kahawai."

- 17.6 In accordance with this catch history allocation approach, the Ministry advised the Minister to allocate the TAC 'allowances' to each sector on the basis of estimates of each sector's current catch (based on catch history).
- 17.7 The Ministry advised the Minister to base the TACCs and recreational allowances for KAH 1, KAH 2, KAH 3, and KAH 8 at a 15% proportional reduction of estimates of recreational and commercial fishers current catch (see paragraph 223 and Table 8 under paragraph 242 of the 2004 FAP). The TACCs and recreational allowances for KAH 4 and KAH 10 were based on nominal values.
- 17.8 The Ministry also advised the Minister to base the customary allowance for KAH 1, KAH 2, KAH 3, and KAH 8 on an estimate of current catch, which was estimated at 25% of recreational current catch (see paragraph 208 of the 2004 FAP). The customary allowance for KAH 4 and KAH 10 were also based on nominal values.
- 17.9 The Ministry advised the Minister to base the estimates of current catch for the recreational sector on catch history. The recreational sector's estimates of current catch were based on the lowest estimates of harvest for each stock from the 1999-2000 and 2000-2001 recreational surveys (see paragraph 97 of the 2004 FAP). This was deemed to be the best available information and resulted in the estimate of recreational current catch 44% higher than proposed in the IPP. As explained in more detail below there is some uncertainty associated with all the recreational harvest estimates.
- 17.10 The Ministry also advised the Minister to estimate the customary current catch at 25% of the estimates for recreational current catch (at paragraph 107 and 208 of the 2004 FAP). Those estimates are, therefore, also linked to catch history. Customary current catch had been estimated at 50% of the recreational current catch in the IPP, but was reduced to 25%, apparently in light of the increased estimate of recreational catch used in the FAP.
- 17.11 The Ministry advised the Minister to estimate current catch for the commercial sector based on average commercial landings for the five year period from 1998 – 2003 (at paragraphs 75 and 239 of the 2004 FAP).

18. **The Minister's 2004 decision - fishing rights based on catch history**

18.1 Following the Ministry's advice, the Minister decided to allocate the TAC on the basis of current catch.

18.2 The Minister's 2004 decision to allocate fishing rights was closely tied to the decision to set TACs, with both decisions being based on the same catch history information. At paragraph 9 of his 2004 decision, the Minister said :

*"The alternative basis for setting TACs is to base them directly on the current use of the kahawai fishery (or a proportion of that use). This method has the advantage of reflecting ... **the current reliance on the fishery by each sector.**"*

[Emphasis added]

18.3 The Minister made an apparent reference to the Ministry's utility allocation model (at paragraph 21), even though no specific option using this model was evaluated or offered to him in the IPP or the FAP:

"I have examined options for increasing the value to society from allocation decisions."

18.4 The Minister then decided to base each sector's allowance solely on catch history, with the purported certainty of the information available taking a prominent role in the Minister's reasoning. At paragraph 21, the Minister said:

"...in the case of kahawai, given the uncertainty in the available information I believe that the information on current use [catch] provides the best basis for allocating between each interest group. Accordingly I have decided to set allowances and TACCs that reflect current use in the fishery, reduced proportionally to fit within the bounds of the TAC set to ensure sustainability."

18.5 The advice to the Minister does not evaluate whether catch history was an appropriate tool for the distribution of rights between sectors, and whether sole use of catch history information would properly allow for non-commercial interests. The advice to the Minister should have evaluated the extent of non-commercial fishing interests and what other information was available on non-commercial catch rates and size of fish, when making an allowance for those interests. Instead, the Minister's explanation of his decision concentrates on the purported certainty of catch history compared to other information in the sense that catch history can be calculated with relative certainty, but not

whether catch history information (alone) is an appropriate tool for allocation in an important non-commercial fishery.

- 18.6 The TACCs and recreational allowances were proportionally reduced by 15% for KAH 1, KAH 2, KAH 3, and KAH 8 to fit within the bounds of the TACs set. The TACCs and recreational allowances for KAH 4 and KAH 10 were set at nominal values. The customary allowance was set at a proportion of recreational catch for KAH 1, KAH 2, KAH 3, and KAH 8, and at nominal values for KAH 4 and KAH 10.
- 18.7 This meant that individual commercial quota allocations were reduced by 15%. The Minister also suggested that additional management measures would be required to ensure a recreational catch was reduced by a similar proportion. Kahawai is included with 18 other species in a combined amateur daily bag limit of 20 fish per person in north and central New Zealand, and a 15 per person bag limit in southern New Zealand. Given the current low catch rates in many areas in my view it is likely that a very significant reduction in the bag limit would be required to actually reduce recreational harvest by 15%. The Minister states in his kahawai decision (paragraph 22):

"I note that setting an allowance for recreational fishing less than the current level of use will require adopting other management measures to achieve this. A reduction in the daily bag limit per person is the most likely outcome, however MFish will provide me with further advice following consultation with recreational fishing interests on how best to achieve the required restraint on recreational catches."

Fish are harder for recreational fishers to catch at lower levels of biomass

- 18.8 Recreational fishing interests are best served by maintaining fish stocks above B_{MSY} . This is because if stocks are not being fished so hard as to produce the maximum sustainable yield then catch rates are better (with more fish available to be caught per trip) and more fish attain larger sizes, which generally coincides with fish being older.
- 18.9 In developing fisheries, catches can be maintained at high levels for a while, as the accumulated stock biomass is fished down. Eventually, management measures are introduced as fishers notice a marked decline in catch rate. There came a point in the late 1980s, when the commercial catch was at its peak, that the abundance of kahawai appears to have declined rapidly.

- 18.10 The common observation/complaint by non-commercial fishers is that this decline became most noticeable in the late 1980s and the once ubiquitous summer kahawai schools were largely gone. Concern was wide-spread and consistent, as described in the affidavits by Kim Walshe and Jeff Romeril. The cause of this is most likely a substantial reduction in kahawai biomass, with reductions concentrated in QMAs where the purse seine catch was greatest.
- 18.11 The 2004 FAP advised the Minister (paragraph 118) that the Ministry did not accept that any kahawai stock was *depleted* due to commercial fishing, as had been submitted to the 2004 IPP by the recreational fishing sector. This assumption appears to be largely based on a belief that that catches did not exceed the national estimate of MSY for long and the decline in national commercial landings since 1990 (see Figure 1 2004 FAP). In advising the Minister the relevance of these historical catch figures which led to a reduced kahawai biomass does not appear to be well explained in the 2004 FAP. A significantly reduced biomass will adversely affect the present quality of fishing for non-commercial fishers. The Ministry do not address how a lower biomass relates to the evidence of low catch rates in KAH 1 and the very poor state of kahawai stocks in the Hauraki Gulf.
- 18.12 The Ministry acknowledged that there was a lack of scientific information concerning recreational catch rates during the 1980s (see paragraph 349, 2004 FAP). The Ministry's response to submissions (Annex 1 paragraphs 336 – 358 of the 2004 FAP) did attempt to analyse data on the change in recreational fishing during the 1990s, which appears to show small changes. I note the Ministry also rejects the Sanfords submission that there has been no decline in kahawai stocks (paragraph 352 to 358). However, the focus of the Ministry's advice to the Minister is the apparent stability of recreational catch in "*recent years*". In my view comparisons based on changes in recreational catch rates since the early 1990s are not very meaningful in addressing the effects on kahawai biomass caused by the pre-1990 expansion of the commercial fishery.
- 18.13 In order to scientifically ascertain the effect on non-commercial fishers of a historically high commercial catch, it would be necessary to compare information on kahawai abundance and catch rates before and after the peak in commercial purse seine catch in the late 1980s.

18.14 It follows in my view, that the best available information on kahawai abundance and catch rate prior to the rise in commercial fishing are credible reports from experienced fishers (commercial and recreational) and from representative groups such as the New Zealand Recreational Fishing Council and New Zealand Big Game Fishing Council. This so called anecdotal information or observational reporting has been taken seriously by the Ministry in the past and acted upon. In a discussion document titled "*Kahawai: proposals for the management of the kahawai fishery*" in 1990 the Ministry stated under the heading "The need for management change":¹⁰

"Recreational fishers state that the recreational kahawai fishery:

- has suffered significantly reduced catch rates because of increasing fishing pressure on the stock;*
- has significantly declined in quality in recent years, both in size of the fish available and in abundance of fish;*
- is no longer managed to provide recreational access to a reasonable share of the kahawai resource;*
- is in conflict with commercial fisheries, particularly with purse seiners and set netters.*

Maori consider that management of the kahawai fishery needs to recognise:

- that kahawai has been traditionally fished by Maori; that Maori share the same concern about reduced quality of fishing, sizes of kahawai and catch rates, as stated by recreational fishers."*

18.15 The Ministry accepted back then the need for management change and the Minister introduced purse seine competitive catch limits in 1991. Given that Ministry surveys of recreational catch only started in 1991, if the recreational catch rate and quality of the fishery has not appreciably improved over the last 14 years then this suggests that the kahawai management up until 2004 has failed to rebuild the stock or improve the quality of the non-commercial fishery in many areas.

18.16 In general terms as the stock is fished down and as abundance decreases it becomes more difficult for non-commercial fishers to find and catch fish or to maintain catches. In contrast, commercial purse seine vessels aided by spotter planes have the ability to maintain catch rate even at lower levels of abundance. As described in the affidavit by Kim Walshe there were a number of incentives for commercial fishers to

¹⁰ MAF Fisheries (1990) Reptot from the Fishery Assessment Plenary, April – May 1990: Stock Assessments and Yield Estimates, at page 95.

increase kahawai harvest in the 1980s and no quota restrictions at that time.

18.17 There is evidence that in some QMAs large increases in commercial catch (which established commercial catch history) lead to decreases in the non-commercial catch, therefore reducing this sectors catch history (see Appendix). In making initial decisions under the QMS a "status quo" catch history approach with fixed proportional reductions across the board may have been attractive due to its administrative simplicity and a superficial appearance of equity but in my view it does not address the long-standing management issues in some QMAs.

18.18 In my opinion the Minister would need to consider a non-proportional approach in order to adequately allow for non-commercial interests in kahawai which have been impacted by the lower biomass caused by fishing down the kahawai stocks.

19. **The consequences of a 15% reduction in commercial and recreational catch**

19.1 For individual commercial fishers and companies their share of the kahawai catch was reduced in several ways by QMS introduction and the 2004 decision.

19.2 Firstly, for commercial fishers, allocations of individual transferable quota would have been proportionate to their best consecutive 12 month period during their "qualifying years", during either the 1990/91 or 1991/92 fishing year. Commercial catches at the time were higher at around 5000 tonnes per year. However, commercial catch history during the 5 recent years used by the Ministry to set the TACCs was about 3565 tonnes. The provisional catch history calculated for individual fishers on the basis of catch during 1990/91 or 1991/92 would have been higher than their share of the TACC.

19.3 Secondly, the Minister reduced the TACC by 15% in the main QMAs to a national total of 3035 tonne.

19.4 Thirdly, 20% of each TACC was required to be set aside for the Treaty of Waitangi Fisheries Commission under section 44 of the Act. Commercial fishers were invited to sell their quota back to the crown but

almost all was acquired compulsorily by the Crown.¹¹ The Treaty of Waitangi Fisheries Commission would have received about 600 tonne of quota and the Crown paid about \$379,000 in compensation to compulsorily acquire this from commercial fishers.

- 19.5 As a consequence, many commercial fishers would have received less than half as much kahawai quota as they caught in the best consecutive 12 month period during the 1990/91 or 1991/92 fishing years.
- 19.6 During the catch history years 80% of the reported landings in KAH 1 and 73% in KAH 2 were taken as a selected target species by company owned purse seine vessels. Therefore these companies are likely to have experienced the largest reduction in tonnes of quota. However kahawai is a relatively minor component of the recent purse seine fleet catch which consists largely of mackerel and skipjack tuna. Table 2 below summarises purse seine catch by species in QMA1 by fishing season¹².

Table 2 : Estimates of commercial purse seine landings (tonnes) by species and season in QMA1 from catch effort landing returns

Season	Skipjack	Blue mackerel	Jack mackerel	Kahawai	Total (t)
1994/95	275	4,700	7,260	840	13,075
1995/96	2,230	3,800	5,280	1,110	12,420
1996/97	5,970	6,460	5,390	1,190	19,010
1997/98	6,220	4,500	5,440	1,020	17,180
1998/99	3,610	4,130	4,220	1,130	13,090
1999/00	9,580	3,200	2,400	1,370	16,550
2000/01	2,950	9,020	6,870	1,260	20,100
2001/02	2,630	5,800	4,180	840	13,450
2002/03	2,130	6,930	4,920	515	14,495
2003/04	6,950	5,940	5,890	1,200	19,980

¹¹ Letter from Fishserve dated 8 September 2004 Re: Allocation of Quota Shares pursuant to section 50B of the Fisheries Act 1996; Letter from Fishserve dated 24 September 2004 Re: Recommendation of offer to sell Quota Shares to the Crown pursuant to section 50D of the Fisheries Act 1996; Letter from Fishserve dated 27 September 2004 Re: Crown Acquisition of Quota Shares where persons other than the Crown hold more than 80,000,000 Quota Shares.

¹² Ministry Catch and Effort Landing Returns and Plenary Reports 2005.

19.7 Kahawai is an important recreational species, based on catch by weight in harvest surveys and comments and submissions from recreational fishers. The Minister has reduced the tonnage allowed for recreational fishers in the key QMAs by 15%. Unlike the commercial catch there is no *annual* estimate of recreational landings. Even the periodic recreational harvest survey estimates have significant uncertainty. The only certain way that the Minister could implement a 15% reduction in recreational catch is by altering the existing amateur fishing regulations which specify bag limits (15 or 20 per person per day depending on area, along with several other species) and size limits (currently no size limit).

19.8 A nominal 15% reduction in bag limit from 20 fish to 17 fish per day would have almost no effect on the recreational kahawai harvest in the current fishery. This is because as described above half of the fishers targeting kahawai catch no kahawai at all and catch rates (per trip or per hour) are very low, on average.

19.9 The observed recreational kahawai catch per diarist trip is reported in the 2000 national recreational harvest survey and is plotted for KAH 1 in Figure 1.¹³ This shows that two thirds of diarist trips on KAH 1 reported catch of one or more Kahawai. Boat ramp surveys suggest that that the proportion is closer to 50%.

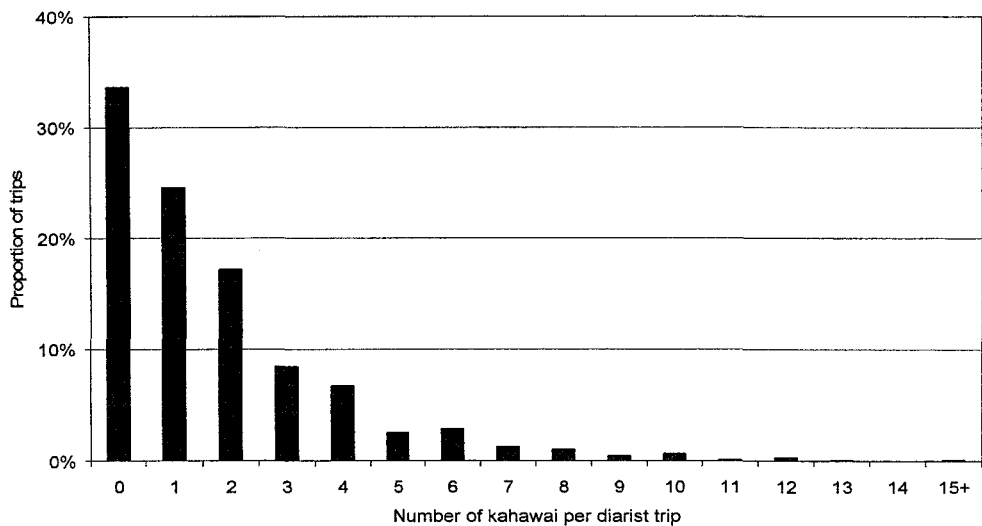


Figure 1: Catch per trip by diarists in KAH 1 during the 2000 recreational harvest survey.

¹³ Boyd, Gowing and Reilly (2004) 2000-2001 National Marine Recreational Fishing Survey: Diary Results and Harvest Estimate.

- 19.10 In order to estimate the proportion of kahawai caught by diarists at each catch interval (eg 1, 2, 3, etc) the number of trips are multiplied by the number of fish in that catch interval and divided by the total of all fish reported. This takes account of the fact that one fisher landing 10 kahawai in a trip catches as much as 10 trips catching one kahawai. About 65% of kahawai were taken on trips catching four fish or less and a further 21% would have been taken if fishers catching more than four kahawai had been restricted to four fish. Therefore a deduction of 14% would have been achieved in 2000 with a bag limit of four fish in KAH 1.
- 19.11 Given the catch rates from diarists shown in Figure 1 it follows that the recreational bag limit would have to be reduced to 3 or 4 per person per day to achieve a 15% reduction in catch in the largest recreational kahawai fishery (KAH 1). The 2004 FAP does not advise the Minister as to whether a bag limit reduction of this magnitude would be feasible. By way of comparison bag limits for hapuku/grouper are 5 per person, snapper limits are 9 to 15 per person and grey mullet (often caught in set nets with a kahawai by catch) is 30 per person per day.¹⁴
- 19.12 The Ministry also had information that indicated that non-compliance with low bag limits could reduce their effectiveness based on NIWA simulation models for snapper and blue cod. A report published in 1999 states that:¹⁵

"Including realistic non-compliance shows that bag limits may be less effective in producing reductions in recreational harvest than expected. If harvest reduction is sought, measures that increase compliance may be equally effective as reducing the bag limit."

- 19.13 The 15% reduction in recreational allowance applies to each QMA. The Minister would need to consider the bag limit reduction required in each QMA separately as catch rates per fisher probably vary from area to area. The distribution of recreational kahawai catch in QMAs other than KAH 1 is not presented in the 2000 national harvest survey report. However, data on kahawai catch rates for other QMAs is available to the Ministry in its recreational survey database called (*rec_data*). Given all the factors, it is my opinion that a bag limit as low as three kahawai

¹⁴ Ministry of Fisheries (2004) Recreational fisher's handbook: October 2004 to September 2005.

¹⁵ Gilbert and Bradford (1999) Effect of changing bag limits and minimum legal size on total harvest in SNA 1 and BCO 7.

per person could have been required to implement a 15% reduction in recreation harvest in KAH 1.

- 19.14 An alternative mechanism for reducing the recreational catch of kahawai by 15% is to raise the minimum legal size. The reduction required by the Minister is in weight (for example 330 t in KAH 1) not numbers of fish. I have used the length distribution from the 2001 NIWA boat ramp survey in KAH 1 and calculated the weight distribution of catch using the length weight relationship by region for KAH 1 as stated in the Ministry's Plenary Report. Removing 15% of catch by weight in east Northland and Bay of Plenty would require minimum legal sizes of 38cm and 40 cm respectively. Current minimum legal size for other species are 25 cm for tarakihi, trevally and red cod and 27 cm for snapper. The Hauraki Gulf fishery is in a poor state and a 15% reduction would mean a 32 cm minimum legal size. Across all regions in KAH 1, to achieve a 15% reduction by weight would require size limits that would reduce the numbers of kahawai able to be caught by recreational fishers by 30%. This is because it takes more small fish to make up the weight reduction. The effect of non-compliance and increased fishing related mortality (due to the need to return undersized fish) would also need to be considered.
- 19.15 At issue is the assumption in the 2004 decision that reducing the recreational bag limit or increasing the size limit to achieve the 15% reduction in recreational harvest could be achieved without unduly affecting recreational interests in terms of the purpose of the Act.
- 19.16 The Minister released a media statement on 13 December 2004 stating that he was not considering reducing recreational bag limits at that time and that a review of the 2004 kahawai decision was likely in 2005. In part the statement reads:

"Today Mr Benson-Pope announced a decision not to change bag limits. He says a number of factors had contributed to the decision, including an earlier decision to conduct more research on the recreational catch and to review kahawai decisions next year....."

"I am sufficiently convinced that no immediate reduction to bag limits is necessary," says Mr Benson-Pope. "We have channelled significant new research funding into kahawai in the coming year that will allow us to make robust decisions on issues like this. I believe that in the interests of fairness this is the right decision."

Non-commercial fishing interests

- 19.17 The 2004 decision takes a simple volumetric (total tonnage of catch) approach to allowing for non-commercial fishing interests. This is not adequate in my opinion for important recreational species because non-commercial fishing interests are more complex and different from commercial fishing interests. A more detailed description of the diverse nature of commercial fishing interests is given in the affidavit of Keith Ingram. One of the key management objectives for a recreational fishery is to improve, where practical, the quality of fishing¹⁶. Leaving aside intangible factors, the main easily measurable factors that influence the quality of fishing for recreational fishers are:
- a. The catch rate measured as numbers of fish caught over a period of time (CPUE);
 - b. The size of the fish caught.
- 19.18 Allowing for non-commercial fishing interests solely by issuing tonnage allowances is not directed at satisfying non-commercial interests. In my view low catch rates and small size of kahawai in many areas in KAH 1 will not improve until there is a rebuild in the kahawai stock in this QMA. The Minister's decision ensures that 48% of the national kahawai catch entitlement occurs in KAH 1.
- 19.19 The high levels of purse seine catch during the late 1980s (when commercial catches of kahawai were largely unconstrained) removed a large amount of biomass out of the kahawai fishery. Non-commercial fishers have been reporting low catch levels since that time, particularly in areas like the Hauraki Gulf and traditional fisheries in the eastern Bay of Plenty. These reports are supported by the available catch rate data. When there is a high risk that non-commercial catch rates have been depressed by past commercial fishing, I believe that current catch estimates are a particularly poor measure of non-commercial interests.
- 19.20 The single goal of the Ministry Strategic Plan 2003 – 2008 is to:
- “Maximise the value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment”.*
- 19.21 It is within the Minister's discretion to take account of how the value to society obtained through the sustainable use of kahawai can be maximised. The Ministry recognised the low port price of kahawai. It is

¹⁶ Minister of Fisheries (1989) National Policy for Marine Recreational Fisheries.

a high volume, low value commercial fish species. The relative value of a fish species to a fishing sector is relevant to the value that New Zealander's place on the fishery resource. Recognising the different values of sector groups becomes more important in fish stocks where there are competing demands between fishery sectors for a limited resource. The Ministry advised the Minister of the uncertainty in the utility information (by "utility" I mean value to society) (paragraph 199 of the FAP):

"MFish considers that there is subjectivity attached to both consideration of catch history and utility. As evidenced by the discussion on catch history in the earlier sections of this paper, catch history is contentious. MFish considers that much of the critique of the utility model and estimates provided in the IPP can be addressed, however MFish confirms its view (acknowledged in the IPP) that there is a great deal of uncertainty attached to quantitative assessments of value."

19.22 The uncertainty in the quantitative information about utility does not prevent the Minister from considering utility subjectively, or from a broader qualitative perspective.

19.23 The Minister states in his 2004 decision that he considered utility options:

"I have examined options for increasing the value to society from allocation decisions. However, in the case of kahawai, given the uncertainty in the available information I believe that the information on current use provides the best basis for allocating between each interest group."

19.24 Having carefully studied the Minister's 2004 decision, and the advice to the Minister it is unclear to me what options the Minister has examined for increasing value to society from allocation decisions. There were no specific options based on utility presented in the 2004 IPP or the 2004 FAP. Although the utility information may have been uncertain, as were the estimates of current non-commercial catch, in my view it was open to the Minister to consider utility based information in conjunction with catch history information, and other measures of fish availability in each kahawai stock.

19.25 Logically the consideration of utility value follows from understanding the true nature and scope of non-commercial fishing interests in kahawai. This includes a range of factors such as historic reliance, the relative value to customary Maori fishers, the use of kahawai by sustenance and

subsistence fishers, the contribution to recreational catch, evidence of regional depletion, non-commercial catch rates and the size of fish landed.

20. Problems with estimates of recreational catch

- 20.1 Estimating the recreational catch, even for the most common species, has proven problematic. Early regional surveys and the first national recreational harvest survey in 1996 tended to underestimate the proportion of the New Zealanders that fished. The methodology was improved for the 2000 national survey (and the 2001 follow on survey) and as a result most harvest estimates increased significantly.
- 20.2 The Ministry held a series of meetings it called the Recreational Technical Working Group (RTWG) to discuss each component of the recreational harvest surveys. A telephone diary or personal interview and diary survey has three main components:
- a. the population that fishes recreationally, the group eligible to complete diaries identified by telephone or face to face interviews;
 - b. a diary survey which generates the average catch in the eligible population; and
 - c. the average weight of the catch, usually estimated from boat ramp surveys.
- 20.3 The Recreational Technical Working Group concluded that the methodological framework used for telephone interviews produced low eligibility figures for the 1996 and previous surveys. Consequently, the harvest estimates derived from these surveys are generally considered to be unreliable.
- 20.4 The RTWG concluded that the harvest estimates from 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.
- 20.5 The kahawai 2004 IPP used the average value of the 1996 and the 2000 survey to estimate recreational catch by QMA. In the 2004 FAP, the Ministry used the lowest value from the two most recent surveys in 2000

and 2001. It is possible that these estimates are higher than actual catch in some stocks but, again, even this is uncertain.

- 20.6 I agree with the conclusions of the RTWG that the 2000 and 2001 recreational harvest estimates have a great deal of uncertainty. I regard the recreational catch estimates from these surveys as uncertain. However they are possibly no less certain than any of the other estimates that the Minister could have used, including those for utility (value).

Part C: Kahawai IPP 2005

21. Kahawai IPP 2005

- 21.1 At the time of swearing this affidavit the Ministry is consulting on a new proposal to review kahawai catch limits and allowances. The IPP was released following the Ministers speech to the New Zealand Recreational Fishing Council Annual Conference in Wellington on 8 July 2005 [JH 4]. I refer to the new IPP as "IPP 2005" [JH 5].
- 21.2 It is most unusual for the Ministry and the Minister to review the TACs and allocations for a species, with fresh options, within a year of the initial decision being made. I am not aware of this occurring for any other species.
- 21.3 The stated purpose of the review is to look at options for providing greater confidence that the TACs would provide for an increase in biomass (paragraph 7 of the IPP 2005).
- 21.4 The IPP 2005 states many of the factors that the Minister earlier considered in his 2004 decision letter. It also states that recreational stakeholders remain concerned that the current measures are insufficient to ensure that kahawai stocks increase in size, while commercial fishers consider the decisions to be overly conservative.
- 21.5 The Ministry state that it is unknown whether stocks are currently above or below the biomass that can produce the maximum sustainable yield (B_{MSY}) and there is no new stock assessment information available. A project that is sampling recreationally caught kahawai in KAH 1 has shown the size and age structure has stayed relatively constant with each region and there is some evidence presented of a declining catch per trip in the Hauraki Gulf. A new kahawai stock assessment project is due to report back in 2007 which may use recreational catch rates as an

index of abundance. As all the recreational survey data is post 1991 it will be interesting to see how this can be used to define the decline in the fishery which largely happened prior to that time.

21.6 There are two options proposed by the Ministry in IPP 2005:

"The first is to maintain the status quo TACs, allowances and TACCs pending new scientific information to support a change. This option assumes that current catch limits will at least maintain and preferably provide for an increase in the kahawai biomass. The second option is to reduce TACs to take account of the uncertain information surrounding the status of kahawai stocks and achieve greater probability that these will increase pending a future reassessment of stock status. Adopting any option to reduce TACs would require that the decrease be based on a nominal percentage reduction.

21.7 Option 1 is the status quo and is therefore subject to the same errors and omissions described in my evidence above for the Minister's 2004 decision. Option 2 proposes a 10% reduction in TACs in all kahawai QMAs. This reduction is achieved by reducing all TACCs and allowances by 10%. This includes the nominal allocations made in KAH 4 (Chatham Islands) and KAH 10 (Kermadec Islands), the Maori customary allowance in the four main QMAs, the recreational allowance in six QMAs, the TACC in six QMAs, and the allowance for fishing related incidental mortality in 3 QMAs, as set out in Table 3 below

Table 3: Options for setting TACs, allowances and TACCs for kahawai.

Stock	TAC	Customary allowance	Recreational allowance	TACC	Fishing-related incidental mortality
KAH 1					
Option 1 (Status quo)	3 685	550	1 865	1 195	75
Option 2	3 315	495	1 680	1 075	65
KAH 2					
Option 1 (Status quo)	1 705	205	680	785	35
Option 2	1 530	185	610	705	30
KAH 3					
Option 1 (Status quo)	1 035	125	435	455	20
Option 2	935	115	390	410	20
KAH 4					
Option 1 (Status quo)	16	1	5	10	0
Option 2	14	1	4	9	0
KAH 8					
Option 1 (Status quo)	1 155	125	425	580	25
Option 2	1,040	115	385	520	20
KAH 10					
Option 1 (Status quo)	16	1	5	10	0
Option 2	14	1	4	9	0

- 21.8 The Ministry rationale for option 2 is based on adopting a specific management objective for all kahawai in New Zealand of managing the stock above B_{MSY} . I agree with the Ministry that this would benefit non-commercial fishers as eventually it will result in increasing the availability of fish and increasing the size of fish in some areas. The Minister must decide whether such benefit is reasonable (see paragraphs 13–17 IPP2005).
- 21.9 It follows that the converse is also true. Where a stock is fished below the level that will support B_{MSY} then the size and availability of fish for non-commercial fishers will be lower. Given the assumptions made in the Bradford simulation modelling B_{MSY} is reached when a kahawai stock is fished down to 16% of its virgin biomass (Table 9 IPP 2005).
- 21.10 For option 2 the Ministry for the first time state a specific management objective for kahawai in the IPP 2005 of managing above B_{MSY} . However, I believe the mechanism chosen to meet this objective, a 10% reduction in all allocations "across the board" still fails to meet the specific requirements of the Act to ensure sustainability in each QMA. The Ministry propose a "nominal percentage reduction" of 10% following an "arbitrary" reduction of 15% applied equally to all QMAs and to each fishing sector. The IPP 2005 option 2 is in effect simultaneous decision-making (with the decisions to set TACs, TACCs and to "allow for" non-commercial fishing interests) all based on the same proportional reduction of existing allowances.
- 21.11 The IPP 2005 contains no specific consideration of the individual management requirements and sustainability concerns in individual QMAs. The KAH 1 kahawai stock is treated exactly the same as the nominal allowance at the Chatham Islands.
- 21.12 There has been a change in the Ministry advice on the need for a reduction in recreational bag limits to implement the reduction in allowance. As signalled by the Minister in his media statement of 13 December 2004 no change to the bag limit was required as the actual recreational catch was likely to be less than the allowance made in the Minister's 2004 decision. Even with an additional 10% reduction (option 2 of the IPP 2005) the Ministry suggest that recreational catch will remain below the allowance in all QMAs (paragraph 80 IPP 2005).
- 21.13 The IPP 2005 contains some new survey information that shows (a continuation of) low kahawai catch and catch rates in the Hauraki Gulf in

2003/04. This confirms that the Hauraki Gulf Maritime Park has the lowest kahawai abundance and non-commercial catch rates in the country. It is too early to expect any effect of management of kahawai in the QMS less than a year after introduction. However, the early results of a new harvest survey only seem to add to the uncertainty (paragraph 79 IPP 2005).

"It is unknown whether changes in abundance of the stock, availability due to environmentally induced effects, previous catch estimates being too high, or other seasonal effects are responsible for this recent low catch of kahawai in this area."

- 21.14 Although it is correct that it is not known for certain what has caused changes in stock availability in the Hauraki Gulf, given the known history of the fish the most likely and obvious reason is stock depletion due to over-fishing. While the Ministry notes the situation in the Hauraki Gulf a national solution (10% reduction) is the recommended management response.

Part D: Concluding Observations

22. Concluding Observations

- 22.1 The Minister decided in 2004, based on the Ministry's advice, that there was insufficient information to determine target stock sizes at or above B_{MSY} for each QMA. In the absence of the detailed information needed to set TACs under section 13, the Minister decided to base the TACs on catch history.
- 22.2 Catch history estimates were also the basis for setting TACCs and setting the non-commercial allowances for customary Maori and recreational fishers.
- 22.3 The 2004 decisions to set TACs, TACCs, to "allow for" non-commercial fishing interests and to ensure sustainability, all based on the same catch history information, became in effect the one bundled exercise. The decision to set TACs based on catch history facilitated the decision to allocate fishing rights between fishing sectors but in my opinion did not address sustainability and recreational interest issues in individual QMAs.
- 22.4 The Minister acknowledged the concerns of non-commercial fishers and expressed a desire to manage kahawai stocks above B_{MSY} , in their favour. The importance of the recreational fishery is also recognised in

the allocation of 58% of the TAC to non-commercial interests. However, the informational "tool" that the Minister applied, namely catch history, while one relevant factor, has been applied exclusively. In my view this does not fully evaluate the fishery for non-commercial management values or sustainability objectives. In my opinion, the Minister's 2004 decision had the following flaws or errors because:

- a. The Minister adopted a "one size fits all" approach by basing TACs in each QMA and each fishing sectors' catch allowances solely on catch history and implementing an arbitrary 15% reduction equally across all the main QMAs;
- b. The Minister adopted a national approach to TAC setting, without properly evaluating the sustainability of kahawai stocks in individual QMAs;
- c. With respect to particular QMAs, the Minister's decision to set TACs did not properly take into account issues of social, economic and cultural wellbeing pertaining to non-commercial fishers;
- d. The Minister should have assessed the particular sustainability concerns for kahawai in key recreational areas, such as the Hauraki Gulf. The KAH 1 area has historically been the subject of very high levels of commercial catch which is well documented. Much of this catch was from targeted fishing of kahawai schools by purse seine vessels. It is also the area in which recreational fishers have consistently indicated concerns. The recently reported poor catch rate and small size of kahawai in the Hauraki Gulf are well evidenced in information available to the Ministry.
- e. The Minister based the TACs, TACCs and non-commercial allowances in each QMA on catch history without apparent regard to a broader range of information that was available to the Ministry to evaluate the sustainability of kahawai stocks, and sectoral interests, in each QMA. This broader range of information included information on current catch and maximum sustainable yield but also includes:
 - Fish size;
 - Time taken to catch fish;

- Historic reliance;
 - Other measures of trends in fish availability, in each QMA;
 - The relative value of kahawai to each sector.
 - The rationale for pre QMS management measures;
 - Indications of the effectiveness of pre QMS management;
 - Evidence of regional depletion;
 - The relative size of QMAs;
 - The distribution of fishing effort (and fishing method) across QMAs;
 - Direct observations of experienced fishers.
- f. The Minister should have recognised the limitations of adopting a fixed policy approach of basing TACs solely on catch history, or a proportion of that, given the management history of the kahawai fishery and the thrust of submissions by the recreational sector. In particular, the Minister should have considered that basing TACs solely on catch history has the effect of concentrating catch allowances in the QMAs that have experienced the greatest fishing pressure.
- g. The advice to the Minister did not fairly or properly evaluate the risk that non-commercial catch has been eroded by past high levels of commercial catch. This was not picked up in the available recreational survey data (post 1991), which commenced after a period of very intensive commercial fishing. Anecdotal reports from the early 1990s were consistently highlighting poor kahawai catches and the absence of surface schools;
- h. The Minister accepted in para 18 of his 2004 decision that there was "a risk attached to the status of some kahawai stocks, in particular KAH 1, KAH 2, KAH 3 and KAH 8", but did not determine the extent of such risks, nor the impact of such risks on recreational interests in all or any of these QMAs, nor how it should affect the determination of allowances or TACCs;
- i. The Minister's 2004 decision made an allowance for recreational fishers in tonnes based on estimated harvest levels minus 15%. Based on the 1999–2000 national recreational harvest survey, a bag limit of 3 kahawai per person would be required to achieve a

15% reduction in recreational harvest in KAH 1. Had this been considered it would have illustrated the poor state of the recreational fishery.

- j. The Minister has not, in the face of the absence or uncertainty of information in relation to key questions for decision (eg. para 5 – para 15 status of kahawai stocks 2004 decision letter), adopted a cautious approach.
- k. The release of a new IPP 9 months after the 2004 decision is highly unusual. The review does not appear to be based on the availability of new information, rather the announcement of a significant new policy tool (managing stocks above B_{MSY} in important shared fisheries). While management above B_{MSY} will be favourable to non-commercial interests, the options of status quo or a 10% proportional reduction across all allowances in my opinion suffer from the same faults as I have set out for the 2004 decision.

22.5 The Minister's 2004 decision concerned an initial allocation into the quota management system. The Ministry has signalled to interested parties that further information will be available through a stock assessment and survey data that will be available for decision making in 2006 but more likely 2007. My hope is that the future decision making, guided by the outcome of these proceedings, will be open to a wider range of considerations than catch history which, in my opinion when used in isolation, is a crude management tool for ensuring fishery sustainability especially for fisheries with a high non-commercial component.

Part E: Appendix

23. Sustainability Information

Information on sustainability of the KAH 1 stock

- 23.1 Information is available to the Ministry and Minister in various reports about the probability of recreational fishers catching kahawai and their average catch per trip. This data is from boat ramp interviews of fishers returning with their catch which can be counted and measured by the interviewer. For fishing trips targeting kahawai in KAH 1 over 50% of fishers caught no kahawai on a trip (proportion of zero fish p_0) and the average catch rate was 0.8 kahawai per hour in the Hauraki Gulf and Bay of Plenty, and 0.9 kahawai per hour in the east Northland (ratio of means H_2).¹⁷
- 23.2 The 1996 boat ramp survey conducted by the Ministry of Fisheries also shows that most people interviewed report that they are targeting fish in general or that they are targeting snapper. However, 77% of trips targeting snapper or general fish in the Bay of Plenty and east Northland caught no kahawai and the catch per hour was 0.15 and 0.13 respectively. Recreational kahawai catch rates are much lower in the Hauraki Gulf (0.07 fish per hour in total). Catch rates on the west coast of the North Island are somewhat higher (0.24 kahawai per hour). In my view these catch rates are low for such a major recreational species.
- 23.3 The commercial purse seine fleet is based in KAH 1 and tends to catch most of the TACC in the Bay of Plenty. By population the majority of non-commercial fishers live in Auckland, Bay of Plenty and Northland and fish in KAH 1. As a result, fishing pressure on kahawai has been greatest in KAH 1 and both the non-commercial and commercial catch histories are highest in KAH 1.
- 23.4 In Figure 2 below I have plotted the combined current catch estimates that the Minister used when setting TACs in KAH 1, KAH 2, KAH 3 and KAH 8 in the 2004 decision. The size of the initial TACs set in 2004 for each area are plotted on the right.

¹⁷ Table 22 in Bradford (1999) Comparison of marine recreational fishing harvest rates and fish size distributions.

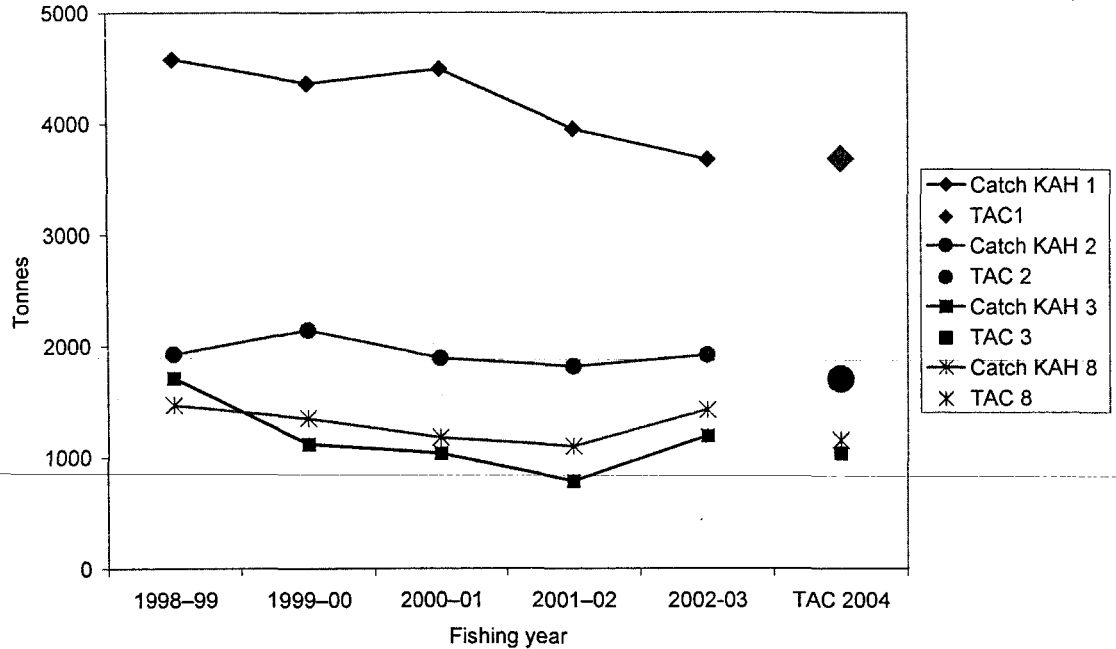


Figure 2. The combined catch history for the years used by the Ministry for setting TACs for the main Kahawai QMAs.

23.5 In Figure 2 the catch estimates plotted are the sum of reported annual catch for the commercial sector (Table 3 2004 IPP), plus constant recreational (Table 6 2004 FAP) and customary harvest (Table 7 2004 FAP). The TACs set by the Minister in 2004 are on the right and include the 15% reduction for commercial and recreational fishers. Figure 2 illustrates that the TACs set by the Minister for the four key QMAs corresponded to catch history, with catch being concentrated in KAH 1 and the TAC for KAH 1 being the greatest.

23.6 KAH 1 is also the smallest QMA in size. The Minister decided in September 2003 to use the kahawai QMAs shown in Figure 3 below in order to effectively manage kahawai stocks. I have taken Figure 3 below from the Minister's 6 November 2003 decision letter concerning stocks to be introduced into the QMS on 1 October 2004.

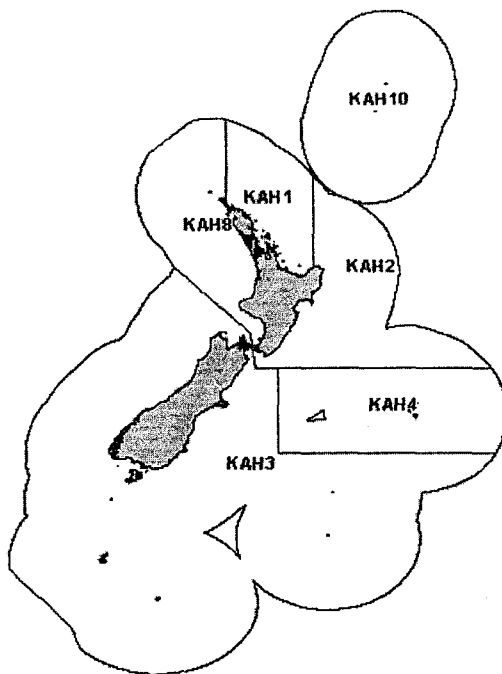


Figure 3. Kahawai quota management areas.

23.7 The relative size of the main QMAs and the relative size of the TACs for each QMA are plotted in Figure 4 below.¹⁸

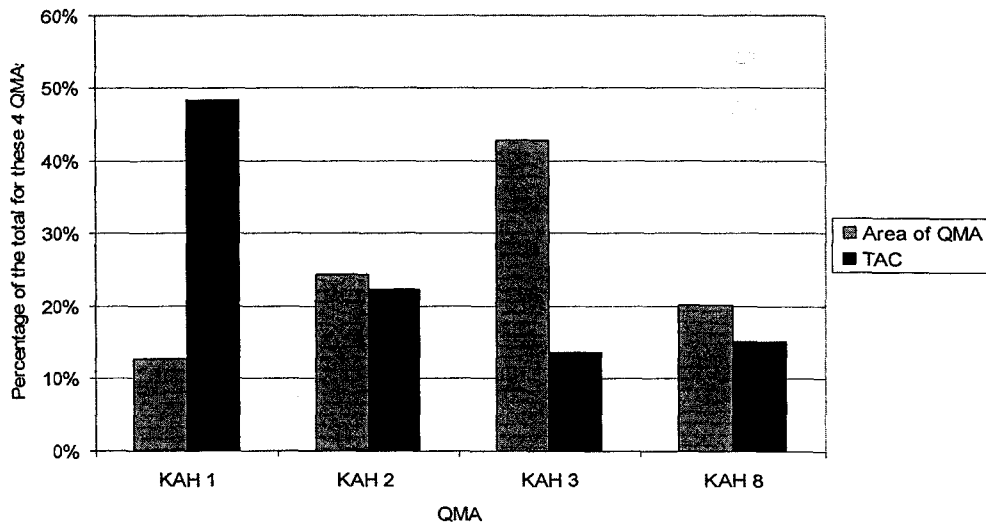


Figure 4. Relative size of the main kahawai quota management areas compared with the relative size of the TAC set for each quota management area in the Minister's 2004 decision.¹⁹

¹⁸ Ministry of Fisheries provided the area of QMAs in square km on request.

¹⁹ Note, in this figure I make the assumption that there are no kahawai as far south as the subantarctic islands, therefore the area around the subantarctic islands was not included in KAH 3. KAH 4 and KAH 10 represent 14% and 21 % of the New Zealand fisheries waters respectively but were removed from the area calculation as only nominal TACs were allocated there.

- 23.8 The commercial fishing industry has shifted more vessels into KAH 1. Two purse seine vessels that fished out of Nelson for most of the 1990s have been sold and moved north. Now all eight New Zealand inshore purse seine vessels operate out of Tauranga in KAH 1. The purse seine fleet of eight vessels catches about 75% of the commercial catch of kahawai (2004 IPP 2004, Annex 2, paragraph 89). Neither the Ministry nor the Minister gave any apparent regard to this major shift in the commercial fleet. At paragraph 87 of the 2004 IPP, the Ministry state:

"In the past a southern fleet, based in Nelson, fished exclusively for the mackerels and kahawai when fishing in southern waters. With the transfer of some of these vessels to Tauranga the purse seine catch in KAH 3 has declined from landing 1 500 tonnes in 1995-96 to 150 tonnes in 2001-02."

- 23.9 The Ministry's advice does record the decline in the purse seine catch in KAH 3, but not the effect of concentration of purse seine effort in KAH 1. The 2004 FAP says (at paragraph 120):

"Industry submits that profitability of this fishery [KAH 3] has been eroded by measures that they have voluntarily agreed to and the closure of a cannery, which have resulted in a changed distribution of the purse seine fleet. Recreational fishers submit that declining catch rates are a more likely cause of the cessation of purse seine fishing in KAH 3."

- 23.10 The Ministry provided no advice to the Minister on the implications of the shift of two purse seine vessels into QMA 1. For example, commercial fishers take most kahawai in KAH 2 by purse seine. With the purse seine fleet now all based in Tauranga most of the 785 tonne TACC in KAH 2 will be taken east of Cape Runaway (the boundary between KAH 1 and KAH 2) and off the East Coast, instead of from the Wairarapa coast as it would have been when fished from Nelson. This will concentrate more of the commercial catch in the north and may impact upon recreational catch.
- 23.11 KAH 1 is the area where non-commercial fishers have reported the greatest reduction in kahawai catch and the most reduction in sightings of surface schools to the Ministry.
- 23.12 The results of the annual kahawai stock monitoring surveys conducted in KAH 1 by NIWA for the Ministry, which were available prior to the Minister's decision, provides evidence of the sustainability concerns that

non-commercial fishers have in KAH 1, including in relation to the Hauraki Gulf.²⁰

- 23.13 The 2001 kahawai stock monitoring survey was conducted over the peak recreational fishing months (January through April) when most kahawai were expected to be landed. In the Hauraki Gulf, 2708 fishing parties were interviewed. Just 892 kahawai were measured. That equates to less than one kahawai per 3 fishing trips.²¹
- 23.14 In 2004, a new harvest survey was run and the number of interviewers and ramps surveyed increased significantly in the Hauraki Gulf. From the 6304 fishing parties interviewed between December 2003 and April 2004 just 764 kahawai were measured. That is less than one kahawai per 8 fishing trips (see table 4 below).
- 23.15 Table 4 below shows the number of boat trips it took on average to catch one kahawai. I have compiled Table 4 below from boat ramp interview data presented to the Ministry of Fisheries' Pelagic Fisheries Assessment Working Group on 22 April 2005.

Table 4. Boat ramp interview data on the Hauraki Gulf from the Kahawai stock monitoring project recording the number of boat trips sampled and the number of trips per kahawai measured.

Year	Total number of Fishing trips	Kahawai measured	Trips per Kahawai
2001	2708	892	3.0
2002	3211	786	4.1
2003	3415	880	3.9
2004	6304	764	8.3

- 23.16 Not all fishers would be targeting kahawai on their trips. The majority say they target snapper. Data from earlier recreational surveys show kahawai was once a frequent by-catch in the snapper fishery.

²⁰ Hartill *et al.* (2004) Monitoring length and age composition of recreational landings of kahawai in KAH 1 in 2000–01, 2001–02 and 2002–03

²¹ Hartill *et al.* (2003) Length and age compositions of recreational landings of kahawai in KAH 1 in 2000–01 and 2001–02.

²¹ Bradford, E. (2000) Feasibility of sampling the recreational fishery to monitor the kahawai stock.

- 23.17 Table 4 illustrates that the kahawai catch per boat trip is low in the Hauraki Gulf. The catch per angler is even lower. If an average of 3 people per boat is assumed and an average of 4 hours fishing per trip then in the Hauraki Gulf one measurable kahawai was landed per 36 angler hours fished in 2001 and one kahawai per 100 angler hours in 2004.
- 23.18 If catch rates fall to very low levels then some recreational anglers will be discouraged from fishing.
- 23.19 There have been a number of recreational fishing surveys that collected data on recreational kahawai catches recorded at boat ramps. In the 1990s, the purpose of the surveys was to collect information on the average size of all species in the recreational catch to help estimate the recreational harvest.
- 23.20 A plot of the average kahawai catch in the Hauraki Gulf (including fish used for bait or landed in an unmeasurable state) was shown in the kahawai Plenary Report for 2005 (I have inserted that plot at Figure 5 below). The plot shows that the catch per boat was low in 1991 (0.4 fish per boat), slightly higher in 1996 (0.65 fish per boat) but has declined again since.

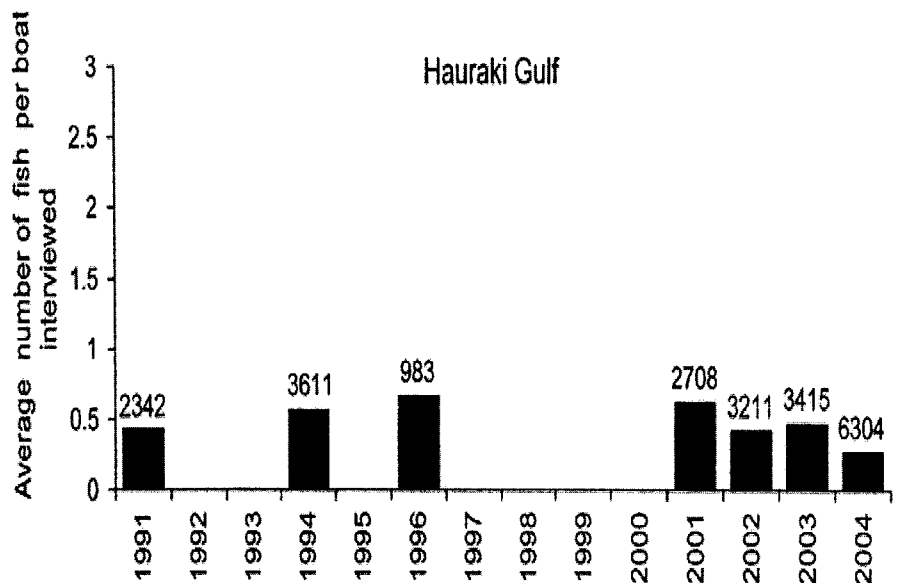


Figure 5: Kahawai catch rate (average number of kahawai per boat interviewed) for recreational fishers interviewed on boat ramps in the Hauraki Gulf since 1991.²²

²² Sullivan *et al.* (2005) Report of the Fishery Assessment Plenary, May 2005: stock assessments and yield estimates. Note, the numbers above the bars denote the number of fishing parties interviewed.

- 23.21 The late 1980s and early 1990s coincided with the peak in commercial kahawai catch as set out in the affidavit of Kim Walshe. Recreational fishers were claiming there had been a significant decline in the availability and size of kahawai at that time. In the Hauraki Gulf at least, that the recreational kahawai catch rate appears to be worse in 2004 than ever.
- 23.22 The size of kahawai in the Hauraki Gulf is also smaller than other areas. Figure 6 below illustrates the type of change that may have taken place in the Hauraki Gulf from the limited data available. In Figure 6, I have plotted the length frequency of kahawai in the Hauraki Gulf collected by NIWA boat ramp surveys between January and April 2001 against the length frequency of kahawai sampled during an extended kahawai tagging project conducted by Ministry scientists (Wood *et al.*) all around New Zealand between October 1981 and March 1984, and published in 1990.²³

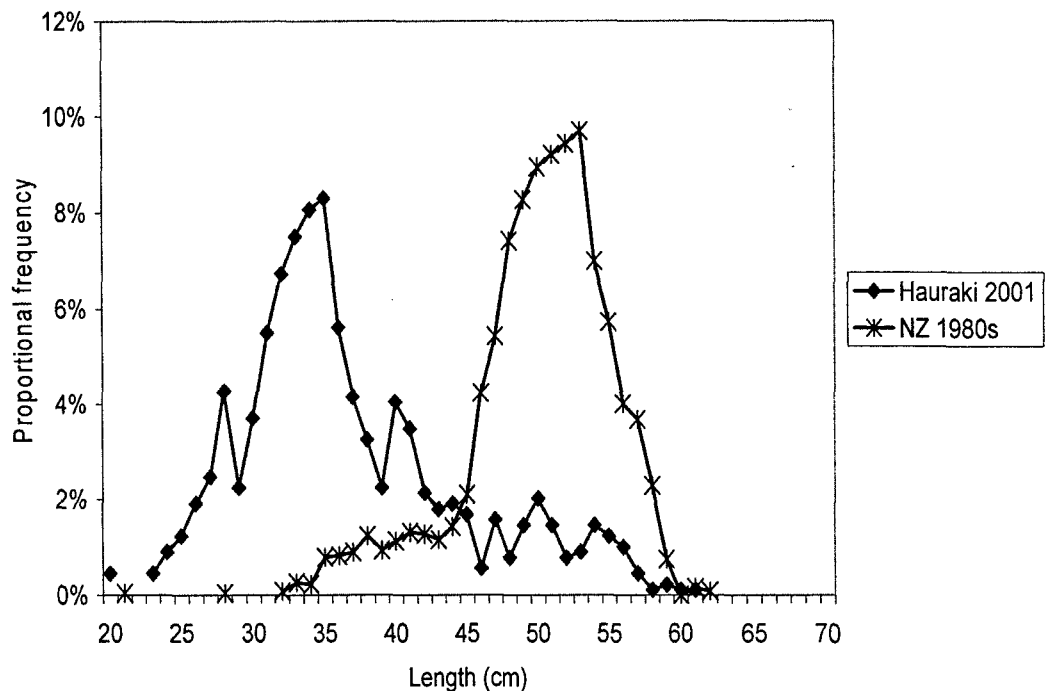


Figure 6: Length frequency of kahawai landed by recreational fishers in the Hauraki Gulf in 2001 compared with the length frequency of kahawai caught by recreational line, set net and purse seine around New Zealand from 1981 to 1984.

²³ Hartill *et al.* (2003) Length and age compositions of recreational landings of kahawai in KAH 1 in 2000-01 and 2001-02; Wood, Bradstock and James (1990) Tagging of kahawai, *Arripis tuta*, in New Zealand, 1981-84; Note, in making this comparison between New Zealand 1984 data, and more recent Hauraki information I note that it is not possible to separate out samples of the recreational catch from samples of the purse seine catch from the data in the 1990 tagging report.

23.23 For the purposes of illustration in Figure 6, I have assumed that the combined length frequency sampled in the early 1980s is a reasonable representation of kahawai available to all fishers at that time. This assumption is based on the following statement made in the 1990 tagging study report by Wood *et al.*:²⁴

Although the catching methods varied, the lengths of fish in each area did not vary with the method used.

23.24 The Wood *et al* report also states that more small fish were caught on recreational lines than purse seine so it can be expected that many of the small fish (35 to 45 cm) in the early 1980s sample came from recreational fishing.

23.25 Figure 6 illustrates that there are few large kahawai landed by recreational fishers in the Hauraki Gulf these days. NIWA sampling in the 3 years since 2001 shows a similar pattern with even less large fish in 2003–04.

23.26 A 50cm kahawai weighs about 1.8 kg and would be considered a reasonable size by most recreational fishers. In 2001, only 8% of kahawai landed by recreational fishers from the Hauraki Gulf were over 50 cm. In 2003–04 only 4% of kahawai landed by recreational fishers from the Hauraki Gulf were over 50 cm.

23.27 The NIWA surveys also collected samples to age the kahawai caught by recreational fishers in each region of KAH 1. I have plotted these results in Figure 7 as a cumulative frequency graph. This is a method used to help compare frequency distributions. With this type of plot a higher proportion of young fish in the catch will shift the line to the left. Again, data from the Ministry survey in the early 1980s is plotted to indicate the age of fish in the national population at that time.

²⁴ Wood, Bradstock and James (1990) Tagging of kahawai, *Arripis tuta*, in New Zealand, 1981-84.

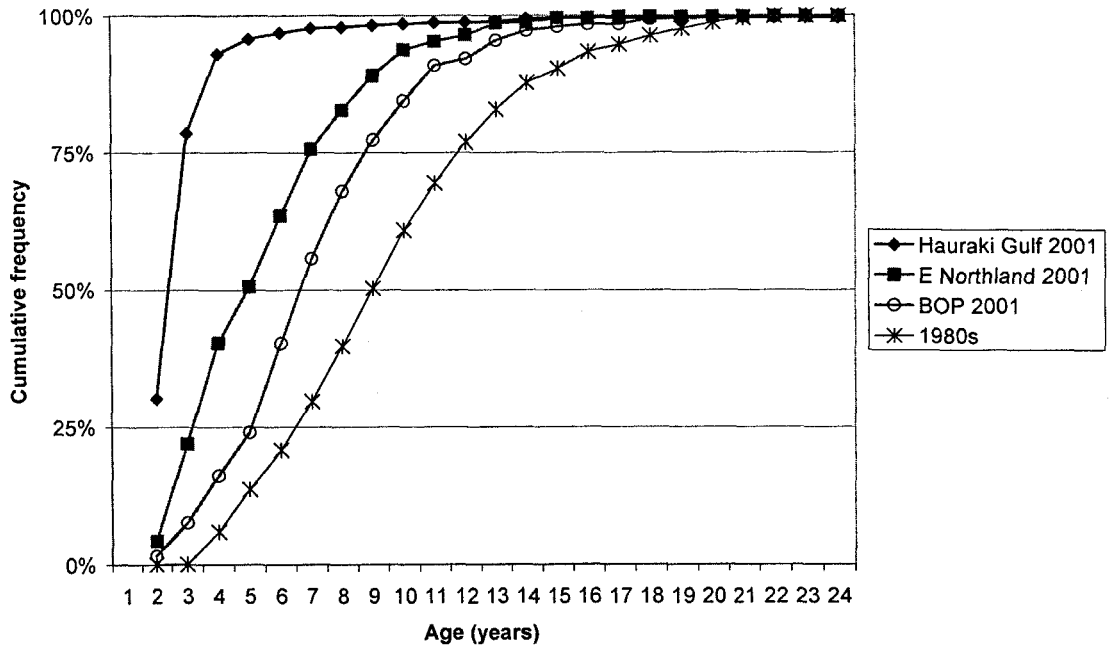


Figure 7. The cumulative age frequency of kahawai landed by recreational fishers in the Hauraki Gulf, East Northland and the Bay of Plenty in 2001 and the cumulative age frequency of kahawai caught by recreational line, set net and purse seine around New Zealand from 1981 to 1984.

- 23.28 In 2001 the recreational catch in the Hauraki Gulf was clearly made up of young fish, whereas there were more older fish in recreational landings in East Northland and the Bay of Plenty.
- 23.29 Kahawai become sexually mature at about 5 years old.²⁵ From the plots in Figure 7 only 4% of kahawai in the Hauraki Gulf fishery are 5 years or older. In East Northland, close to 50% are 5 years and older in 2001, while about 75% of kahawai taken in the recreational fishery in the Bay of Plenty are 5 years and older. Data from the 1980s may not be completely comparable, but the sample from the less heavily fished population at that time recorded 86% of the catch as 5 years and older in the Bay of Plenty.
- 23.30 A low catch rate across KAH 1 for a once common species, smaller size of fish, and very few adults all point to serious stock depletion in the Hauraki Gulf. All of this information was readily available to the Ministry prior to the Minister's 2004 decision. There is no material "uncertainty"

²⁵ Bradford, E. (1997) Update of kahawai simulation model for the 1997 assessment and sensitivity analysis.

in it, because the sample sizes are reasonable and these patterns have been consistent across subsequent surveys.

- 23.31 In the 2004 FAP and 2004 IPP the Ministry did not inform the Minister of the signs of stock depletion in the Hauraki Gulf when setting the TAC in KAH 1.
- 23.32 This data supports the anecdotal information from experienced fishers that there has been a significant decline in surface schools of kahawai in KAH 1 which occurred in the late 1980s, at the time that purse seine vessels were catching many tonnes of kahawai from the Bay of Plenty and elsewhere. In my view there is clear evidence of a major problem in KAH 1 which did not receive apparent consideration even though information was readily available.

Information on sustainability of the KAH 2 stock

- 23.33 Kahawai is known to be a very significant amateur and customary Maori fishery in KAH2, topping the harvest estimates in the 2001 harvest survey in front of snapper and blue cod in QMA2.
- 23.34 Reported amateur catch rates for kahawai target fishing are low in KAH 2 (in Hawke Bay 44 % of target trips were successful and average catch per target trip was 1.05 kahawai) and very low in the Wairarapa (37% of target trips were successful and average catch per target trip was 0.68 kahawai).²⁶
- 23.35 The mean weight of kahawai in the amateur catch in 2000 was 1.6 kg. Details of the length distribution in KAH 2 are in the MFish rec_data database.
- 23.36 There is evidence based on direct observation (and also recorded in submissions to the 2004 IPP) that there has been a significant reduction in the number of visible surface schools of kahawai in areas of KAH 2.
- 23.37 The shift of the only two Nelson based purse seine vessels to Tauranga in 2001 will shift the purse seine fishing activity in KAH 2 from the Wairarapa and the lower North Island to East Cape where the customary fishery may be even more adversely.

²⁶ Bradford (1998) National marine recreational fishing survey 1996: catch and effort results by fish zone.

- 23.38 The kahawai stock was fished down by purse seine fishers with reported catches as high as 1660 t per year in KAH 2 in the late 1980s.
- 23.39 The highest plausible estimate of amateur catch is 820 tonnes per year from the 2001 national telephone and diary survey.
- 23.40 KAH 2 is larger than KAH 1 in area but the coastline would be similar in length.

Information on sustainability of the KAH 3 stock

- 23.41 Kahawai is also known to be a very significant amateur and customary Maori fishery, second only to blue cod in KAH 3.
- 23.42 In this area, as in others non-commercial fishers have a long-standing grievance about the large purse seine target catch and the disappearance of kahawai (surface schools in particular) as a target species in an unconstrained commercial fishery until October 1990.
- 23.43 Historically, this QMA supported the largest kahawai fishery in New Zealand.
- 23.44 The kahawai stock was fished down by purse seine fishers with reported catches as high as 5700 t per year in KAH 3 in the late 1980s. The purse seine fishing method was clearly responsible for fishing down the KAH 3 biomass.
- 23.45 Amateur catch rates for kahawai target fishing are low in KAH 3 (Tasman Bay and Golden Bay 31 % of target trips were successful and average catch per target trip was 0.69 kahawai) on the south east coast of the South Island kahawai have all but disappeared from amateur catch.²⁷
- 23.46 The mean weight of kahawai in the amateur catch in 2000 was 1.6 kg in KAH 3. Details of the length distribution in KAH 3 are in the MFish rec_data database.
- 23.47 The shift of the only two Nelson based purse seine vessels out of KAH 3 and into KAH 1 will significantly reduce the targeting of Kahawai in KAH 3. Consequently catch largely taken as bycatch when fishing for other species has been quite low in recent years.

²⁷ Bradford (1998) National marine recreational fishing survey 1996: catch and effort results by fish zone.

- 23.48 The highest estimate of amateur catch is 670 tonnes per year from the national telephone and diary surveys.
- 23.49 KAH 3 is the largest kahawai QMA in New Zealand but in the southern half abundance can be low or seasonal.

Information on sustainability of the KAH 8 stock

- 23.50 Kahawai is also a very significant amateur and customary Maori fishery, second only to snapper in KAH 8.
- 23.51 The purse seine target catch has not historically been large in KAH 8 and mainly in the south half which previously was part of KAH 3 pre-QMS.
- 23.52 Amateur catch rates for kahawai target fishing are not consequently as low as the other QMAs.

Table 5. Recreational catch per kahawai target trip in KAH 8. ²⁸

Recreational Fishing Zone	% successful target trips	Average catch on a target trip
Ninety Mile	57.1	2.00
Dargaville	68.1	2.96
Kaipara H	55.2	2.28
Manukau H	51.3	1.68
Waikato	53.3	1.55
Taranaki	47.2	1.20
Manawatu	43.8	1.27

- 23.53 Non-commercial fishers do experience reasonable catch rates at times in the northern areas of KAH 8.
- 23.54 The mean weight of kahawai in the amateur catch in 2000 was 1.3 kg in the old area KAH9. Details of the length distribution in KAH 8 are in the MFish rec_data database.

²⁸ Bradford (1998) National marine recreational fishing survey 1996: catch and effort results by fish zone.

- 23.55 The shift of the only two Nelson based purse seine vessels out of KAH 3 and into KAH 1 will reduce the targeting of Kahawai in the southern areas of KAH 8.
- 23.56 Historically, this QMA supported the smallest commercial kahawai target fishery in New Zealand.
- 23.57 The kahawai reported catches peaked in the old area KAH9 at 800 t per year in the late 1980s.
- 23.58 The highest estimate of amateur catch in the new KAH 8 area is 525 tonnes per year from the national telephone and diary surveys.
- 23.59 KAH 8 is the second longest coastline of the kahawai QMAs in New Zealand
- 23.60 The commercial catch is largely genuine bycatch of the trawl and set fisheries in the region.

SWORN by **JONATHAN CLIVE**
HOLDSWORTH at Auckland

this 26th day of August

2005 before me:

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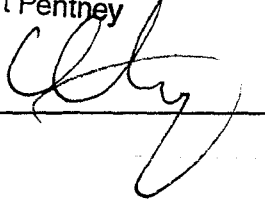
Campbell Robert Pentney
Solicitor
Auckland

A Solicitor of the High Court of New Zealand

JH 1

This is the document marked **JH 1** mentioned and referred to in the affidavit of **JONATHAN CLIVE HOLDSWORTH** sworn at Auckland this 26th day of August 2005 before me:

Campbell Robert Pentney
Solicitor
Auckland



Solicitor of the High Court of New Zealand

FINAL RECOMMENDATIONS

Bigeye Tuna

1 MFish recommends that you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for bigeye tuna otherwise than in accordance with s13(2) of the 1996 Act.
- b) **Agree** to set a TAC for bigeye tuna pursuant to s 14 of the 1996 Act.
- c) **Agree** to set a TAC for bigeye tuna of 725 tonnes and within this set:
 - i) A customary allowance of 4 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance of 14 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 699 tonnes.
- d) **Note** that there will be a small economic impact associated with this option.

OR

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

Blue Shark

2 MFish recommends you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for blue shark otherwise than in accordance with s 13(2).
- b) **Agree** to set a TAC for blue shark pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 2 080 tonnes for BWS 1 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 20 tonnes;
 - iii) An allowance for other fishing-related mortality of 190 tonnes; and
 - iv) A TACC of 1 860 tonnes.

- ✓ d) **Agree** to add blue shark to the Sixth Schedule of the 1996 Act to allow for return to the sea with the following conditions

That they are:

- i) Likely to survive
- ii) Returned to the same waters from which they are taken, and
- iii) Are returned as soon as practical.

- ✓ e) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.

- ✓ f) **Agree** to set the deemed value for BWS 1 at \$0.15/Kg.

- ✓ g) **Note** that a separate review of the conversion factor for blue shark, landed as fins only, is in train.

Kahawai

3 MFish recommends that you

- a) **Note** the contents of this advice and attached stakeholder submissions on kahawai management proposals,
- b) **Note** that the information regarding the status of kahawai stocks is uncertain
- c) **Note** that having regard to the uncertainty surrounding stock status, MFish has a preference for the lower of the TAC options proposed,
- d) **Note** that having regard to the uncertainty in estimates of utility for kahawai, and the views of stakeholders, MFish has a preference for the allowances and TACCs within the lower of the TACs proposed to be determined in proportion to the current use of recreational and commercial sectors and;

EITHER

- e) **Agree** to set a TAC of 4,235 tonnes for KAH 1 and within that TAC set:

- i) A customary allowance of 550 tonnes;
- ii) A recreational allowance of 2,195 tonnes;
- iii) An allowance for other fishing-related mortality of 85 tonnes; and
- iv) A TACC of 1,405 tonnes.

- f) **Agree** to set a TAC of 1,970 tonnes for KAH 2 and within that TAC set:

- i) A customary allowance of 205 tonnes;
- ii) A recreational allowance of 800 tonnes;
- iii) An allowance for other fishing-related mortality of 40 tonnes; and
- iv) A TACC of 925 tonnes.

- g) **Agree** to set a TAC of 1,190 tonnes for KAH 3 and within that TAC set:

- i) A customary allowance of 125 tonne;
- ii) A recreational allowance of 510 tonne;
- iii) An allowance for other fishing-related mortality of 20 tonne; and

- iv) A TACC of 535 tonnes.
- h) **Agree** to set a TAC of 16 tonnes for KAH 4 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 10 tonnes.
- i) **Agree** to set a TAC of 1,330 tonnes for KAH 8 and within that TAC set:
 - i) A customary allowance of 125 tonnes;
 - ii) A recreational allowance of 500 tonnes;
 - iii) An allowance for other fishing-related mortality of 25 tonnes; and
 - iv) A TACC of 680 tonnes.
- j) **Agree** to set a TAC of 16 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.

OR

- k) **Agree** to set a TAC of 3,685 tonnes for KAH 1 and within that TAC set:
 - i) A customary allowance of 550 tonnes;
 - ii) A recreational allowance of 1,865 tonnes;
 - iii) An allowance for other fishing-related mortality of 75 tonnes; and
 - iv) A TACC of 1,195 tonnes.
- l) **Agree** to set a TAC of 1,705 tonnes for KAH 2 and within that TAC set:
 - i) A customary allowance of 205 tonnes;
 - ii) A recreational allowance of 680 tonnes;
 - iii) An allowance for other fishing-related mortality of 35 tonnes; and
 - iv) A TACC of 785 tonnes.
- m) **Agree** to set a TAC of 1,035 tonnes for KAH 3 and within that TAC set:
 - i) A customary allowance of 125 tonne;
 - ii) A recreational allowance of 435 tonne;
 - iii) An allowance for other fishing-related mortality of 20 tonne; and
 - iv) A TACC of 455 tonnes.
- n) **Agree** to set a TAC of 16 tonnes for KAH 4 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;

- iii) An allowance for other fishing-related mortality of 0 tonne; and
- iv) A TACC of 10 tonnes.

- o) **Agree** to set a TAC of 1,155 tonnes for KAH 8 and within that TAC set:
 - i) A customary allowance of 125 tonnes;
 - ii) A recreational allowance of 425 tonnes;
 - iii) An allowance for other fishing-related mortality of 25 tonnes; and
 - iv) A TACC of 580 tonnes.

- p) **Agree** to set a TAC of 16 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.

AND

- q) **Agree** to set annual deemed values of:
 - i) KAH 1 \$0.66 / kg; and
 - ii) KAH 2, 3, 4, 8 & 10 \$0.61 / kg;
- r) **Agree** that differential deemed values apply;
- s) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns;
- t) **Note** that once kahawai becomes subject to the QMS fishing permit conditions applying purse seining catch limits and vessel restrictions on the taking of kahawai will no longer be applicable. Accordingly, the chief executive will revoke these fishing permit conditions;
- u) **Note** that if you elect to reduce the current use of kahawai MFish will initiate consultation with the recreational sector to determine the best method of achieving the required catch constraint.

Lookdown Dory

4 MFish recommends that you:

- a) **Agree** to set a TAC of 168 tonnes for LDO 1, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 168 tonnes.
- b) **Agree** to set a TAC of 614 tonnes for LDO 3, and within the TAC set the following:
 - i) A customary allowance of 0 tonnes;

- ii) A recreational allowance of 0 tonnes;
- iii) An allowance for other fishing-related mortality of 0 tonnes; and
- iv) A TACC of 614 tonnes.

✓ c) **Agree** to set a TAC of 1 tonne for LDO 10, and within the TAC set the following:

- i) A customary allowance of 0 tonnes;
- ii) A recreational allowance of 0 tonnes;
- iii) An allowance for other fishing-related mortality of 0 tonnes; and
- iv) A TACC of 1 tonne.

✓ d) **Agree** to amend Part 1 of Schedule 3 of the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for lookdown dory to be used by fishers when completing their statutory catch returns.

✓ e) **Agree** to set an interim deemed value of \$0.21 per kg and an annual deemed value of \$0.42 per kg for the 2004-05 fishing year.

Mako Shark

5 MFish recommends you:

✓ a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for mako shark otherwise than in accordance with s 13(2).

✓ b) **Agree** to set a TAC for mako shark pursuant to s 14 of the Act.

✓ c) **Agree** to set a TAC of 512 tonnes for MAK 1 and within that TAC set:

- i) A customary allowance of 10 tonnes;
- ii) A recreational allowance of 50 tonnes;
- iii) An allowance for other fishing-related mortality of 46 tonnes; and
- iv) A TACC of 406 tonnes.

d) **Agree** to add mako shark to the Sixth Schedule of the Act subject to the conditions that they are:

- j) Likely to survive;
- ii) Returned to the same waters from which they are taken; and
- iii) Are returned as soon as practical.

✓ e) e) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.

✓ f) **Agree** to set the deemed value for MAK 1 at \$0.15/kg.

✓ g) **Note** that a review of the conversion factor for mako shark fins is underway.

Moonfish

6 MFish recommends that you:

- a) **Agree** that the purpose of the Act is better achieved by setting a TAC otherwise than in accordance with s 13(2) for moonfish.
- b) **Agree** to set a TAC for moonfish pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 527 tonnes for MOO 1, and within this set:
 - i) A customary allowance of 0 tonnes,
 - ii) A recreational allowance of 0 tonnes,
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality, and
 - iv) A TACC of 527 tonnes.
- (f) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to prescribe a code for moonfish to be used by commercial fishers when completing their statutory catch returns.

7 **Agree** to set an annual deemed value for moonfish of \$0.50/kg.

Pacific Bluefin Tuna

8 MFish recommends that you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for Pacific bluefin tuna otherwise than in accordance with s13(2) of the 1996 Act.
- b) **Agree** that a TAC for Pacific bluefin tuna is set pursuant to s14 of the 1996 Act.
- c) **Agree** to set a TAC for Pacific bluefin tuna of 83 tonnes and within this set:
 - i) A customary allowance of 0.5 tonnes;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 1.5 tonnes for other sources of fishing mortality;
 - iv) A TACC of 80 tonnes;
 - v) **Note** that the TAC proposed will result in a reduction in fishers individual provisional catch histories for Pacific bluefin tuna; and
 - vi) **Note** that the reduction in provisional catch history will have an economic impact on the fishing operations of some fishers.

OR

- d) **Agree** to set a TAC for Pacific bluefin tuna of 120 tonnes and within this set:
 - i) A customary allowance of 0.5 tonnes;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 2.5 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 116 tonnes.

- e) **Agree** to set a deemed value for Pacific bluefin tuna of \$27.75 per kg.
- f) **Agree** that differential deemed values apply.
- g) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001.

Parore

9 MFish recommends that you:

- a) **Agree** to set a TAC of 74 tonnes for PAR 1, and within this set:
 - i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 6 tonnes;
 - iii) An allowance of 4 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 61 tonnes.
- b) **Agree** to set a TAC of 4 tonnes for PAR 2, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 1 tonne;
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 2 tonnes.
- c) **Agree** to set a TAC of 25 tonnes for PAR 9, and within this set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 2 tonnes;
 - iii) An allowance of 1 tonne for other sources of fishing-related mortality; and
 - iv) A TACC of 21 tonnes.
- d) **Agree** to set a TAC of 0 tonnes for PAR 10, and within this set:
 - i) A customary allowance of 0 tonnes;
 - ii) A recreational allowance of 0 tonnes;
 - iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
 - iv) A TACC of 0 tonnes.
- e) **Agree** to include parore as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986.
- f) **Agree** to include parore as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.

g) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to prescribe a code for parore to be used by commercial fishers when completing their statutory catch returns.

h) **Agree** to set for PAR 1, PAR 2, and PAR 10 an interim deemed value of \$0.16 per kg and an annual deemed value of \$0.31 per kg for the 2004–05 fishing year.

10 **Agree** to set for PAR 9 an interim deemed value of \$0.17 per kg and an annual deemed value of \$0.34 per kg for the 2004–05 fishing year.

Pipi – Whangarei Harbour

11 MFish recommends that you:

a) **Agree** to set a TAC of 250 tonnes for PPI 1A and within the TAC set:

- i) A customary allowance of 25 tonnes;
- ii) A recreational allowance of 25 tonnes;
- iii) An allowance of 0 tonnes for other sources of fishing-related mortality; and
- iv) A TACC of 200 tonnes.

b) **Agree** to remove reference to a 200 kg daily limit for commercial harvest of pipi in PPI 1A from Regulation 22A of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.

c) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to introduce a fishstock code for Whangarei pipi to be used by commercial fishers when completing their statutory catch returns.

d) **Agree** pipi (PPI 1A) be added to Schedule 5A of the Fisheries Act 1996.

e) **Agree** pipi (PPI 1A) be added to Sixth Schedule of the Fisheries Act 1996.

f) **Agree** to set an interim deemed values of \$1.10 per kg and an annual deemed value of \$2.20 per kg for the 2004–05 fishing year.

Porae

12 MFish recommends that you:

a) **Agree** to set a TAC of 75 tonnes for POR 1, and within this set:

- i) A customary allowance of 3 tonnes;
- ii) A recreational allowance of 6 tonnes;
- iii) An allowance of 4 tonnes for other sources of fishing-related mortality; and
- iv) A TACC of 62 tonnes.

b) **Agree** to set a TAC of 9 tonnes for POR 2, and within this set:

- i) A customary allowance of 1 tonne;
- ii) A recreational allowance of 1 tonne;

- iii) An allowance of 1 tonne for other sources of fishing-related mortality;
and
- iv) A TACC of 6 tonnes.
- c) **Agree** to set a TAC of 5 tonnes for POR 3, and within this set:
- i) A customary allowance of 1 tonne;
- ii) A recreational allowance of 1 tonne;
- iii) An allowance of 1 tonne for other sources of fishing-related mortality;
and
- iv) A TACC of 2 tonnes.
- d) **Agree** to set a TAC of 4 tonnes for POR 10, and within this set:
- i) A customary allowance of 1 tonne;
- ii) A recreational allowance of 1 tonne;
- iii) An allowance of 1 tonne for other sources of fishing-related mortality;
and
- iv) A TACC of 1 tonne.
- e) **Agree** to include porae as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986.
- f) **Agree** to include porae as a species specified in the combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Area Amateur Fishing) Regulations 1986.
- g) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to introduce fishstock codes for porae to be used by commercial fishers when completing their statutory catch returns.
- h) **Agree** to set interim and annual deemed values for the 2004-05 fishing year as follows:
- i) POR 1 – an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg;
- ii) POR 2 - an interim deemed value of 0.35 per kg and an annual deemed value of \$0.69 per kg;
- iii) POR 3 - an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg; and
- iv) POR 10 - an interim deemed value of 0.68 per kg and an annual deemed value of \$1.35 per kg.

Porbeagle Shark

13 MFish recommends you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for porbeagle shark otherwise than in accordance with s 13(2).
- b) **Agree** to set a TAC for porbeagle shark pursuant to s 14 of the Act.

- c) **Agree** to set a TAC of 249 tonnes for POS 1 and within that TAC set:
- i) A customary allowance of 2 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 22 tonnes; and
 - iv) A TACC of 215 tonnes.
- d) **Agree** to add porbeagle shark to the Sixth Schedule of the Act subject to the conditions that they are:
- x) Likely to survive
 - xi) Returned to the same waters from which they are taken; and
 - xii) Are returned as soon as practical.
- e) ~~**Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory returns.~~
- f) **Agree** to set the deemed value for POS 1 at \$0.15/kilogram.
- g) **Note** that a review is proposed of the conversion factors for porbeagle shark.

Ray's Bream

14 MFish recommends that you:

- a) **Agree** that the purpose of the Act is better achieved by setting a TAC for Ray's bream other than in accordance with section 13(2).
- b) **Agree** to set a TAC for Ray's bream pursuant to s 14 of the Act.
- c) **Agree** to set a TAC of 1 045 tonnes for RBM 1 and within that TAC set:
- i) A customary allowance of 5 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 50 tonnes; and,
 - iv) A TACC of 980 tonnes.
- d) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns for Ray's bream.
- e) **Agree** to set an annual deemed value for Ray's bream of \$0.18/kg.
- f) **Note** that it is not proposed to set a differential deemed value or overfishing threshold for the Ray's bream stock.

15 **Note** that a carry forward of 10% of ACE is proposed for the Ray's bream stock.

Red Snapper

16 MFish recommends that you:

- a) **Agree** to set a TAC for RSN 1 of 140 tonnes, and within that TAC:
- i) **Agree** to set a Maori customary allowance of 2 tonnes;

- ii) **Agree** to set a recreational allowance of 13 tonnes;
 - iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality; and
 - iv) **Agree** to set a TACC of 124 tonnes.
- b) **Agree** to set a TAC for RSN 2 of 25 tonnes, and within that TAC:
- i) **Agree** to set a Maori customary allowance of 1 tonne;
 - ii) **Agree** to set a recreational allowance of 2 tonnes;
 - iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality; and
 - iv) **Agree** to set a TACC of 21 tonnes.
- c) **Agree** to set a TAC for RSN 10 of 4 tonnes, and within that TAC:
- i) **Agree** to set a Maori customary allowance of 1 tonne;
 - ii) **Agree** to set a recreational allowance of 1 tonne;
 - iii) **Agree** to set an allowance of 1 tonne for other fishing-related mortality; and
 - iv) **Agree** to set a TACC of 1 tonne.
- d) **Agree** to include red snapper as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Auckland and Kermadec Fishing Area Amateur Fishing) Regulations 1986;
- e) **Agree** to include red snapper as a species specified in the maximum combined species bag limit of 20 finfish per fisher per day in the Fisheries (Central Fishing Area Amateur Fishing) Regulations 1986;
- f) **Agree** to set an annual deemed value for all the red snapper stocks at \$4.09 per kg;
- g) **Agree** that a differential deemed value applies; and
- h) **Agree** that the reporting regulations be amended to reflect the new fishstock codes for red snapper stocks.

Southern Bluefin Tuna

17 MFish recommends that you:

- a) **Agree** that the purpose of the 1996 Act is better achieved by setting a TAC for southern bluefin tuna otherwise than in accordance with s13(2) of the 1996 Act.
- b) **Agree** to set a TAC for southern bluefin tuna pursuant to s 14 of the 1996 Act.
- c) **Agree** to set a TAC for southern bluefin tuna of 420 tonnes and within this set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 4 tonne;
 - iii) An allowance of 2 tonnes for other sources of fishing mortality; and
 - iv) A TACC of 413 tonnes.

- d) **Agree** to set a deemed value for southern bluefin tuna of \$46.92 per kg.
- e) **Agree** that differential deemed values apply.
- f) **Agree** to list southern bluefin tuna on the Sixth Schedule of the 1996 Act.
- g) **Agree** not to list southern bluefin tuna on Schedule 5A of the 1996 Act until the outcome of CCSBT consideration of an under and over fishing arrangement is known.
- h) **Agree** to consequential amendments to the Fisheries (Reporting) Regulations 2001 and the Fisheries (Recordkeeping) Regulations 1990.
- i) **Agree** to revoke the Fisheries (Southern Bluefin Tuna Quota) Regulations 2000.
- j) **Agree** to revoke Regulation 26 of the Fisheries (Commercial Fishing) Regulations 2001.

Spiny Dogfish

18 MFish recommends that you:

- a) **Agree** to set TACs for spiny dogfish pursuant to s 13 of the 1996 Act.
- b) **Agree** to set a TAC of 413 tonnes for SPD1 and within that TAC set:
 - i) A customary allowance of 39 tonnes;
 - ii) A recreational allowance of 39 tonnes;
 - iii) An allowance for other fishing-related mortality of 4 tonnes; and
 - iv) A TACC of 331 tonnes.
- c) **Agree** to set a TAC of 5 075 tonnes for SPD3 and within that TAC set:
 - i) A customary allowance of 115 tonnes;
 - ii) A recreational allowance of 115 tonnes;
 - iii) An allowance for other fishing-related mortality of 51 tonnes; and
 - iv) A TACC of 4 794 tonnes.
- d) **Agree** to set a TAC of 1 662 tonnes for SPD4 and within that TAC set:
 - i) A customary allowance of 10 tonnes;
 - ii) A recreational allowance of 10 tonnes;
 - iii) An allowance for other fishing-related mortality of 16 tonnes; and
 - iv) A TACC of 1 626 tonnes.
- e) **Agree** to set a TAC of 3 753 tonnes for SPD5 and within that TAC set:
 - i) A customary allowance of 8 tonnes;
 - ii) A recreational allowance of 8 tonnes;
 - iii) An allowance for other fishing-related mortality of 37 tonnes; and
 - iv) A TACC of 3 700 tonnes.

- g) Agree to introduce swordfish onto the Sixth Schedule with the following stated requirements for SWO 1:
- i) Only swordfish that are smaller than 1.25 metre LJFL may be returned to the sea.

20 Only swordfish (less than 1.25 m LJFL) that are likely to survive and can be returned to the sea as soon as is practicable after being taken may be returned to the sea.


Yellowfin Tuna

21 MFish recommends that: you

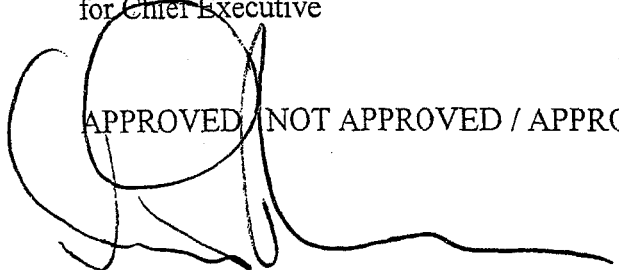
- a) Agree that the purpose of the 1996 Act is better achieved by setting a TAC for yellowfin tuna otherwise than in accordance with s13(2) of the 1996 Act.
- b) Agree to set a TAC for yellowfin tuna pursuant to s 14 of the 1996 Act.
- c) Agree to set a TAC for yellowfin tuna of 358 tonnes and within this set:
- i) A customary allowance of 30 tonnes;
- ii) A recreational allowance of 60 tonnes;
- iii) An allowance of 5 tonnes for other sources of fishing mortality; and
- iv) A TACC of 263 tonnes.
- d) Agree to set a deemed value for yellowfin tuna of \$6.74 per kg.
- e) Agree that differential deemed values apply.
- f) Agree to consequential amendments to the Fisheries (Reporting) Regulations 2001.


Rose Grindley
for Chief Executive


Scott Williamson
for Chief Executive


Arthur Hore
for Chief Executive

APPROVED / NOT APPROVED / APPROVED AS AMENDED

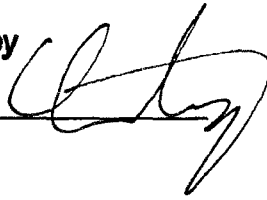

Hon David Benson-Pope
Minister of Fisheries

5/07/2004

JH 2

This is the document marked **JH 2** mentioned and referred to in the affidavit of **JONATHAN CLIVE HOLDSWORTH** sworn at Auckland this 26th day of August 2005 before me:

Campbell Robert Pentney
Solicitor
Auckland



Solicitor of the High Court of New Zealand

Dear Stakeholder

Setting of Sustainability Measures for Kahawai Stocks to be Introduced into the Quota Management System on 1 October 2004

1. I am writing to inform you of my final decisions for managing kahawai stocks during the 2004-05 fishing year.
2. The response to consultation made it clear that management of kahawai is an important issue for all sectors. I note that there were sixty-eight written submissions, 1790 emails and 1668 form petitions received in response to the MFish initial position paper (IPP). I would like to thank those that have taken the time to think about and respond to the important policy issues and management options raised by introducing this species into the Quota Management System (QMS) on 1 October 2004.
3. There are three key areas I have had to decide on in relation to each kahawai stock:
 - Setting Total Allowable Catches (TACs);
 - Allowing for Maori customary, recreational and setting total allowable commercial catches (TACCs); and
 - Management measures in support of decisions.
4. I will address each key area in turn.

Setting TACs

5. While a stock assessment indicated that by 1996 the biomass of kahawai had declined to around 50% of its original level it is unknown whether stocks are currently above or below the biomass that will support the maximum sustainable yield (Bmsy). In the absence of any information for determining a specific stock size as a target level or for gauging the required change in catch levels necessary to achieve any particular target level the matter of a target stock size is largely academic.
6. Nevertheless, uncertainty in the status of current biomass is an important factor that I have taken into account in my consideration of TAC options identified in MFish advice and in stakeholder submissions. The uncertainty in information needs to be considered as does the recreational (and some customary) submissions suggesting that the stocks have declined below acceptable levels. However, I am required to make decisions on TACs despite the uncertainty in current stock status. Having regard to the importance of the stock to all sectors, and therefore the socio-economic benefits associated with harvesting, I wish to take management steps that will at least maintain, if not improve, current biomass.
7. I have carefully considered the available information for setting TACs. There is a 1996 stock assessment for kahawai, historical commercial catch information and estimates of current use for all sector groups available.
8. I have noted that the 1996 stock assessment provides estimates of annual national yield ranging between 5100-14 200 tonnes. However, I note there is some agreement in submissions and MFish advice for considering that the best available interpretation of annual yields from the 1996 stock assessment is either 6900, 7600 or 8200 tonnes. Some commercial and recreational submissions supported basing TAC decisions on these yields but differed on the level that should be chosen. The stock assessment is dated (1996) and the inputs into the assessment are increasingly regarded as being unreliable. Although relevant as a reference point for TAC setting, I have noted that there is considerable uncertainty associated with the 1996 stock assessment.
9. The alternative basis for setting TACs is to base them directly on the current use of the kahawai fishery (or a proportion of that use). This method has the advantage of reflecting public policy and other decisions already made for the fishery and the current reliance on the fishery by each sector. These considerations are reflected in the current management

the uncertainty in information on stock status and trends in abundance. I have concluded that catch reductions are required in key kahawai stocks to ensure their sustainability.

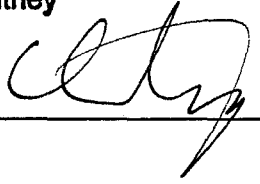
26. The decision making process associated with the entry of kahawai to the QMS is characterised by uncertainty in the information available on stock status and potential sustainable yields. I would therefore encourage stakeholders to continue with voluntary measures to conserve stocks and to collectively consider ways in which the issue of uncertainty surrounding kahawai stock status can be resolved. This could occur within existing research and assessment planning processes or, given the importance of the fishery perhaps within a dedicated stakeholder forum.
27. The recreational sector holds the majority share of the fishery. Improved information from the recreational fishery is crucial for gauging the success or otherwise of management measures. Improved techniques for estimating recreational harvest are being developed. Recreational fishers have an important opportunity to continue influencing the future health of the fishery by agreeing to an effective new recreational management measure for the fishery and by ensuring this measure is complied with to improve the abundance of kahawai.
28. Equally monitoring the ongoing performance of the commercial management regime will be critical to the future management of kahawai stocks.
29. The quality of the debate over management measures and the sheer quantity of submissions, emails and form petitions indicates that this is an important fishery for all users. I am grateful to submitters for their efforts in outlining their views on the fishery.
30. The QMS provides a broad framework to enable people to derive benefits from the fishery. However, to maximise these benefits stakeholders will now need to work together. I urge everyone to take up this opportunity in a collaborative fashion with MFish and other stakeholders.

Yours sincerely
Hon David Benson-Pope
Minister of Fisheries

JH 3

This is the document marked **JH 3** mentioned and referred to in the affidavit of **JONATHAN CLIVE HOLDSWORTH** sworn at Auckland this 26th day of August 2005 before me:

Campbell Robert Pentney
Solicitor
Auckland



Solicitor of the High Court of New Zealand

JH3

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

Final Advice Paper

29 June 2004

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INTRODUCTION

Purpose

- 1 This paper provides advice on kahawai stocks to be introduced into the Quota Management System (QMS) on 1 October 2004. The advice pertains to the setting of Total Allowable Catches (TACs), Total Allowable Commercial Catches (TACCs), and allowances for recreational interests, customary interests and other sources of mortality, and deemed values and overfishing thresholds.

New Species into the QMS

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

Table 1: Quota Management Areas, Fishing Years and Units of Measure for kahawai stocks to be introduced into the QMS on 1 October 2004

Species (code)	Quota Management Areas	Fishing year	Unit of measure
Kahawai	6 based on FMAs 1-4, 8, 10	1 1 October to 30 September	Greenweight

Initial Position Paper and Consultation

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

Outline of Document

- 5 This paper provides you with MFish's **initial position** and **final advice and recommendations** on proposed TACs, TACCs, other allowances and management measures for kahawai stocks to be introduced into the QMS on 1 October 2004.
- 6 This paper is structured so that the **Initial Position** section is followed immediately by the **Final Advice** section.

- 7 In addition, this paper includes a section from the IPP, titled Statutory Obligations and Policy Guidelines, that relate to the setting of TACs, TACCs and other allowances. This section is followed by another section from the IPP, titled Deemed Values and Overfishing Thresholds. The sections on the individual species then follow.

Implementation of Decisions

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

STATUTORY OBLIGATIONS AND POLICY GUIDELINES

Purpose of the Fisheries Act 1996

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

Setting a Total Allowable Catch

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

Maximum Sustainable Yield (s 13)

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

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

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

No Specified Target Stock Level (s 14)

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

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

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

Above Level of Long Term Viability (s 14B)

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

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

Other Statutory Obligations Applicable When Setting a TAC

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

Information Principles

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

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

Environmental Principles

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

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

International Obligations (s 5(a))

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

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

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

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

Additional Factors to be taken into Account (s 11)

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

Guidelines for Setting TACs for New Species

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

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

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

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

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

Development opportunity

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

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

Use of information

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

Table 1: Hierarchy of Information

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

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

Criteria for Determining Catch Levels

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

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

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

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

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

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

Analysis of TAC Options

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

Allocation of TAC

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

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

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

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

Recreational Allowance

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

Māori Customary Non-Commercial Allowance

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

All Other Fishing Related Mortality

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

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

Total Allowable Commercial Catch

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

Setting of Deemed Values and Overfishing Thresholds

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

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

Cost Recovery

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

Regulatory Framework

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

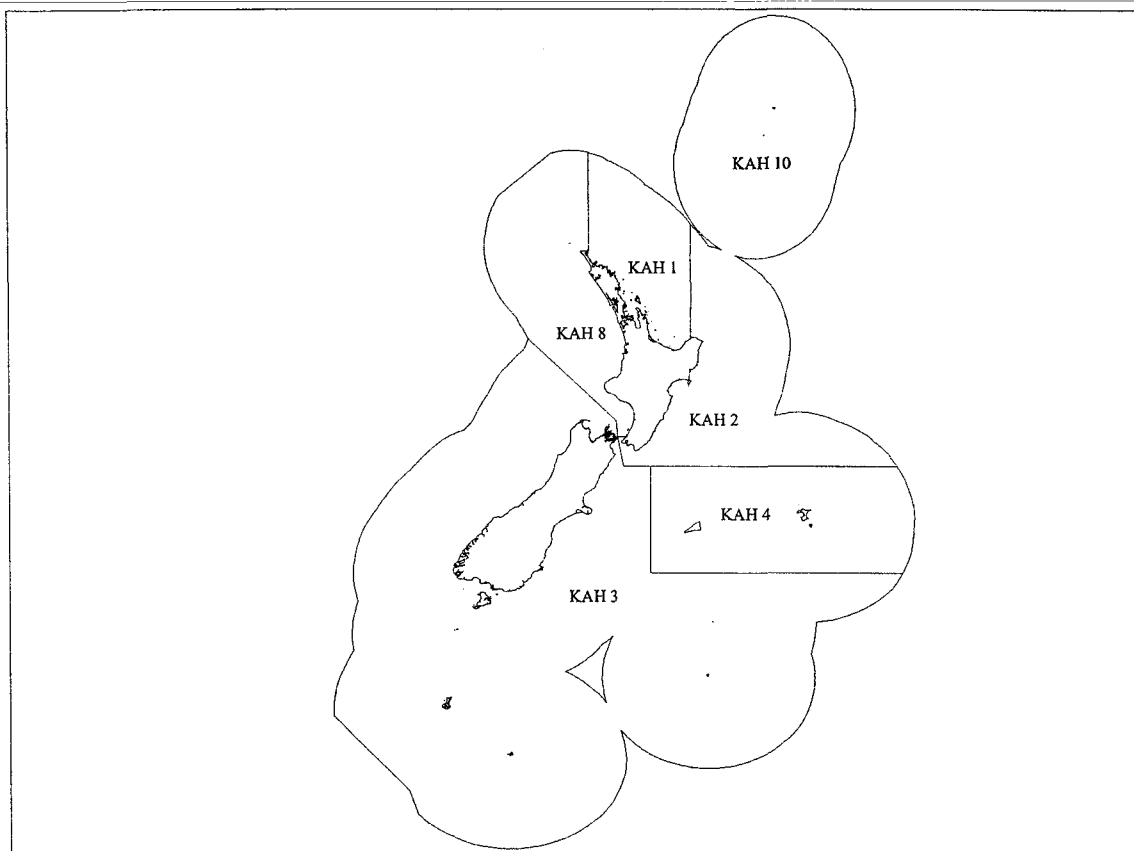
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KAHAWAI (KAH) – INITIAL POSITION PAPER

Introduction into the QMS

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

Figure 1: Quota Management Areas for kahawai



Key Issues to be considered

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

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

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

List of Management Options

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

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

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

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

TACs

TAC management strategy

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

Rationale for proposed TACs

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

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

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

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

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

- 17 The average of the two most recent estimates of recreational landings has been used to estimate current recreational utilisation of the fishery.
- 18 For species and stocks where there is some catch, but the stock is not considered of importance to customary Māori, then current utilisation may be estimated on the basis of half the recreational catch. Kahawai is of considerable interest to Māori in some areas, however there is no information on customary harvest. MFish considers that, even though it is important as a customary fishery, the level is unlikely to equal the level of the recreational fishery and proposes to use 50% of the current level of recreational utilisation as an estimate of current customary harvest.

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

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

KAH 1

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

KAH 2

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

KAH 3

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

KAH 4

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

KAH 8

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

KAH 10

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

Allocation of TAC

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

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

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

Recreational Allowance

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

Māori customary allowance

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

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

TACCs

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

KAH 1

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

KAH 2

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

KAH 3

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

KAH 4

- 50 There is one TACC option proposed for KAH 4. Based on a nominal value it is proposed that the TACC for this management area be set at 10 tonnes. MFish considers this TACC appropriately reflects the current level of use in this fishery.
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KAH 8

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

KIN 10

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

Allowance for other sources of mortality

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

Other Management Measures

Method Restriction

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

Consequential amendment to regulation

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

Schedule 5A

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

Deemed values and Over-fishing threshold

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

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

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

substantially more than average prices.

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

Statutory Considerations

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

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

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

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

Preliminary Recommendations

66 MFish recommends that the Minister:

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

- iii) An allowance for other fishing-related mortality of 5 tonnes; and
 - iv) A TACC of 635 tonnes.
- f) **Agrees** to set a TAC of 18 tonnes for KAH 10 and within that TAC set:
- i) A customary allowance of 3 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonne; and
 - iv) A TACC of 10 tonnes.
- g) **Agrees** to set an annual deemed value for kahawai of:
- EITHER
- i) \$0.32 per kg;
- OR
- ii) \$0.86 per kg.
- h) **Agrees** that differential deemed values apply.
- i) **Agrees** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.
- j) **Notes** that once kahawai becomes subject to the QMS fishing permit conditions applying purse seining catch limits and vessel restrictions on the taking of kahawai will no longer be applicable. Accordingly, the chief executive will need to revoke these fishing permit conditions.

ANNEX ONE

Removing redundant fishing permit conditions

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

Background

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

Problem definition

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

Preliminary consultation

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

Options

Non-regulatory measures

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

Regulatory Measures

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

Costs and benefits of the proposal

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

Administrative implications

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

ANNEX TWO

Species Information

Species biology

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

Fisheries characteristics

Commercial catch

Catch and landing by QMA

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

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

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

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

Catch by fishing method

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

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

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

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

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

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

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

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

Targeted catch and bycatch

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

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

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

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

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

Number of vessels catching and landing

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

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

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

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

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

Recreational catch

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

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

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

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

- no estimate

Based on preliminary results from the 2001 national survey

* estimate pertains to FMA 9 only.

100 A national survey estimated annual recreational landings of kahawai during the 1991-94 period to be 1 800 tonnes. A national survey conducted in 1996 produced an estimate of 1 515 tonnes that was broadly consistent with the earlier estimate. However, the survey conducted in 1999-2000 produced an estimate of kahawai landings of 2 195 tonnes for KAH 1 (compared to 960 tonnes in 1996). There remains some doubt about the estimates from the 1996 and 1999-00 surveys. The uncertainty revolves around the participation rates of recreational fishers used in each survey. Those for 1999-2000 may be too high and those for 1996 may be too low. Assuming a common participation rate for both surveys will have the effect of lowering the 1999-2000 estimate and increasing the 1996 estimate.

101 The average of the two most recent estimates of recreational landings are proposed as the best basis for estimating current recreational utilisation. Because the recreational harvest surveys report on the fishstock codes an arbitrary amount (54 tonnes) was removed from the KAH 3 estimate and added to the KAH 9 estimate to account for area changes in establishing KAH 8.

102 Recreational groups have repeatedly expressed concern about the state of kahawai stocks. High percentages of respondents to readership surveys conducted by fishing magazines in 1989, 1990, 1993 and 1997 felt that the numbers of kahawai available to recreational fishers had declined in the years prior to each survey. In 1992 the Recreational Fishing Council (RFC) carried out a club/individual survey where 188 of 189 responses suggested this decline was at least 50%. In 1997 the RFC carried out a survey of recreational fishers in major fishing magazines. There were 2 002 respondents of which 47% felt that kahawai stocks had 'declined significantly' and

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

Customary catch

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

Regulatory Framework

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

Fisheries assessment

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

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

Table 8: Biological parameters used in the model

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

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

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

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

- 112 The above estimates are uncertain and depend on the model assumptions and input data. They may be regarded as conservative estimates as the estimates of total mortality in the model are based on maximum observed values. The catch history is uncertain due to uncertainties in the commercial catch records, and the non-commercial catch history is based on the 1996 survey. Estimates of MCY were calculated for a single national fishstock. $MCY = pB_0$ where p is determined from a method where the biomass does not go below 20% B₀ more than 20% of the time.
- 113 The base case described for the above parameters provides the basis for the lesser MCY estimate. A sensitivity analysis was undertaken where the non-commercial catch was greater than that based on the 1996 harvest estimate. This has the effect of increasing estimates of B₀, B_{MSY}/B₀, B₁₉₉₆/B₀, and MCY and is the basis for the greater estimate of MCY provided in the range given in Table 9.

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

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

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

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

Associated fisheries

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

Environmental Issues

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

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

Current and Future Research

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

Social, Cultural, and Economic Factors

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

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

KAHAWAI (KAH) – FINAL ADVICE

Initial Proposals

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

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

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

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

Submissions

- 5 Submissions on the proposals for kahawai are listed below and are summarised and addressed under the relevant sections of this advice.
 - Akaroa Harbour Recreational Fishing Club Inc
 - Allan, Alastair D
 - Anderson, Douglas
 - Barnett, Jarrod
 - Bates, David
 - Bay of Islands Charter Fishing Association
 - Bay of Plenty Conservation Board
 - Benfell, V.
 - Bert Lee (Tolaga Bay East Cape Charters)
 - Carey, Bruce
 - Clark, Peter
 - Coleman, Bruce
 - Collett, Bruce
 - Council of Outdoor Recreation Associations of NZ Inc

- Craig, Eileen
 - Crump, Phillip and Betsy
 - Daniel, Neven
 - Dennis, John
 - Dickson, G.M.
 - Feldman, Mark
 - Forsman, Steve
 - Hammond, D.J.
 - Herbert, John
 - Hoani Langsbury (Te Runanga o Otakou (Inc))
 - Horan, John
 - Jones, Christian
 - Joyce, Grahame
-
- Kaikoura Boating Club
 - Larcombe, Myra
 - Lawrence, George
 - Mathews, Bill
 - McKenzie, Weston
 - McLean, David
 - Mercury Bay Ocean Sports Club (Inc)
 - Miller, David
 - Mount Maunganui Sport Fishing Club
 - Non-Commercial Fishers (option4, NZ Big Game Fishing Council, NZ Angling and Casting Association)
 - Northland Conservation Board
 - NZ Angling Limited
 - NZ Marine Transport Association
 - NZ Recreational Fishing Council
 - O'Connor, Bruce
 - O'Donoghue, R
 - Orman, Tony
 - Potter, Trevor
 - Richard Pollock (White Island Marine Charters Ltd)
 - Roberts, Mark
 - Sanford Limited
 - Sealord Group Limited
 - Shanks, Mark
 - Tangiora, Pauline E.
 - Tauranga Game Fishing Club
 - The Northern Inshore Fisheries Company Ltd (NIFCL)
 - The NZ Seafood Industry Council Ltd (SeaFIC)
 - Toi, Harry (Nga Hapu, Ngati Kopaki, Ngati TeAra, the Ngati Kopaki, Ngati TeAra Trust)
 - Tokoroa Sports Fishing Assn (Inc)
 - Townsend, Murray J
 - Te Ohu Kai Moana (TOKM)
 - Treloar, Keven

- van Loghem, Philip
- Vellenoweth, Jim and Mabel
- Waihou Bay Sports Fishing Club Inc
- Ward, Michael
- Wayne T Taylor (Te Kawanga o Kahungunu)
- Whangaroa Big Gamefish Club Inc
- Wong, Christopher
- Wood, R V

- 6 MFish notes that the submissions from the Northland Conservation Board, Mount Maunganui Sportfishing Club, Tauranga Game Fishing Club, Tokoroa Sports Fishing Association, and Waihou Bay Sports Fishing Club all state their support for the submission of Non-Commercial Fishers. Accordingly these submissions are considered as part of the submission from Non-Commercial Fishers.
- 7 MFish notes that the submission from the NZ Marine Transport Association states its support for the submission of the Recreational Fishing Council. Accordingly this submission is considered as part of the submission from the RFC.
- 8 Many of the submissions are lengthy and detailed. To ensure that you are able to refer to these directly rather than rely on MFish summaries a bound copy of submissions is available as a supplement to this advice paper.
- 9 1 790 emails were received from the option4 website by 20 June 2004 in response to option4 alert # 6. A subset of 1453 of these responses provided by option4 on 16 May 2004 are evaluated in Appendix 1 and alert # 6 is replicated in full in Appendix 2. Examples of electronic submissions are available for your perusal if you so wish.
- 10 1 668 form petitions were received by 24 June 2004 supporting the option 4 / NZBGFC submissions on kahawai (see Appendix 3).

Key Issues to be considered

- 11 MFish has reconsidered key issues outlined in the IPP that relate to the decisions for setting sustainability measures for kahawai stocks and now consider these to be as follows:
- a) There are two species of kahawai managed as an assemblage in the QMS: kahawai and northern kahawai. Northern kahawai is probably confined to far northern waters and very little information is available for this species;
 - b) Commercial catches have declined after peaking at 9 600 tonnes in 1987-88 reducing to 2 900 tonnes in 2002-03. The majority of commercial landings is taken by purse seining for kahawai, however during the last five years about 45% of the catch is taken as bycatch of other fisheries. The proportion of target and bycatch varies by stock management area;
 - c) Kahawai is one of the fish species most frequently caught by recreational fishers. MFish has now changed estimates of recreational catch proposed in the IPP, which were based on an average of recreational harvest estimates from national diary surveys;

- d) Technical experts recently reviewed the recreational harvest surveys undertaken in 1996, 1999-00 and 2000-01 and now say that the 1996 estimates should not be used. This group also caution against the use of more recent surveys saying results may be implausibly high for some important fisheries;
- e) Recent survey results (1999-00 and 2000-01) are substantially higher than those from 1996. Accordingly, MFish now considers that recreational utilisation is greater than portrayed in the IPP;
- f) Kahawai supports important Māori customary fisheries but the size of the catch is unknown and can only be estimated as a proportion of recreational catch;
- g) Current estimates of recreational catch exceed that of the commercial sector and when combined with estimates of customary Maori catch the non-commercial fishery is approximately 140% of the size of the commercial fishery;
- h) Recreational fishers have expressed strong concerns over what they perceive is a marked decline in the amount and size of kahawai available to them in recent years and attribute this decline to commercial fishing and purse seining for kahawai in particular;
- i) Industry submits that there is a lack of information to support any suggestion of a decline in stock size and submit information to support no changes in the number of kahawai schools in recent years;
- j) There is conflicting information making it difficult to confirm either claim. However, clearly there are widespread non-commercial concerns about the fishing down of kahawai stocks. Equally there are commercial concerns about the impact of any reduction in catch to that sector;
- k) Both the recreational sector and some parts of industry support managing kahawai at a level of biomass above B_{MSY} . The current biomass of kahawai is unknown;
- l) A 1996 stock assessment for kahawai is an important reference point but it is dated (trends in biomass since that time are unknown) and there is considerable uncertainty associated with its estimates of yield;
- m) A nationwide combined estimate of recreational catch, customary catch, fishing-related mortality and reported commercial landings now exceeds yield estimates based on the 1996 stock assessment;
- n) There is risk that current catches might be unsustainable in the long term and there are competing demands for the use of kahawai between the fishing sectors;
- o) MFish now proposes two options for setting TACs for kahawai, one based on an estimate of current utilisation and the other based on a reduction from current levels of use; and
- p) Alternative options for setting sustainability measures and other controls for kahawai proposed in submissions are outlined and evaluated in this paper.

Biological and Fishery Information

Submissions

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

MFish response

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

Environmental Considerations

Submissions

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

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

range of other species and expresses concern regarding the impact of reduced kahawai stocks.

MFish response

- 19 A number of submitters raise environmental issues that they consider are relevant to the determination of TACs for kahawai stocks. MFish notes that environmental issues and the related statutory considerations are addressed in the IPP at paragraphs 119-122 and paragraph 65 (a)-(g) respectively. In summary, MFish has identified the likely importance of kahawai in the food chain. This is a matter that you can take into account when determining a target biomass for kahawai and the setting of TACs for kahawai stocks.
- 20 In relation to specific submissions, MFish notes that stocks of barracouta and kahawai overlap their distributions throughout most of their respective ranges along the coastlines of both the North and South Island. They have broadly similar niche requirements and are often associated when forming summer feeding aggregations particularly around schools of juvenile jack mackerels or pelagic crustaceans. Tagged barracouta have moved considerable distances (up to 500 nautical miles). It is probably not surprising that at various times particularly when forming these summer feeding aggregations that barracouta are found further north (and kahawai are found further south) than is usual, depending on the movements of their prey. MFish considers this to be a more plausible explanation for the fisher's observations than niche displacement of one exploited stock by another.
- 21 MFish notes that potential effects of reduced kahawai abundance on seabirds were addressed in the IPP at para 119. MFish is aware of one NZ research paper (Robertson 1992) on the effects of food supplies on seabirds. Contrary to the views of submitters, Robertson speculated that reduction of the populations of barracouta, kahawai, gemfish, skipjack and albacore tuna from commercial fishing may have allowed small pelagic species to increase in abundance and which may be contributing to the observed increase in the NZ gannet population during recent decades². While the white fronted tern was once more abundant around the coast, its declining population is believed to be due to predation by stoats, dogs, rats and mustelids. Its accessible nesting habit makes this species particularly vulnerable to disturbance³. International research has concluded that only extreme food shortages cause significant adult bird mortality. However, poor to moderate availability of food can reduce adult body weight, clutch size, breeding success, colony attendance and the growth rates of chicks⁴.
- 22 In summary, the literature suggests that the potential for impacts on other aquatic life is more complex that suggested by submitters. While the potential impacts of sustainable fisheries on seabird populations are likely to be minimal the potentially important role of kahawai in the ecosystem as both a pelagic predator and prey species emphasises the need for caution in management.

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

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

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

TAC

Proposed target level

MFish initial position

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

Submissions

- 24 In general, submitters support the use of the s 13 management arrangements for kahawai stocks.
- 25 However, the submission on behalf of **Non-Commercial Fishers'** considers that the IPP contained no discussion on what kahawai management should aim to achieve. It notes that the goal of the MFish Strategic Plan 2003 – 2008 is: "*Maximise the value New Zealanders obtain through the sustainable use of fisheries resources and protection of the aquatic environment*". It submits that the objective should be to maximise the benefits of this fishery for all New Zealanders. Non-Commercial Fishers also say that MFish must address the 1989 recreational fishing policy objectives in the final advice.
- 26 Further, the submission notes that the IPP claims an overall objective to ensure sustainable management of kahawai. It notes that the Plenary Report infers an acceptable sustainable kahawai stock of about 20% of virgin biomass. Non-Commercial Fishers submit that while this stock size may meet the criteria for maximising commercial harvest it is totally unacceptable to the submitters who require greater consideration of the social, economic, cultural and ecological implications of a kahawai stock reduced to being no more abundant than one fifth of its virgin biomass.
- 27 The submission notes the lack of harvest strategy for kahawai. It notes the adoption of a harvest strategy above B_{MSY} for kingfish and notes that this particular harvest strategy was not widely discussed or agreed to. It submits that the same mistakes are being made for kahawai as management decisions are being taken in the absence of agreed objectives.
- 28 The **RFC** submits that the kahawai fishery should be managed at a biomass greater than B_{MSY} .
- 29 **BOPCB** and many other recreational submissions submit their concerns relating to the fishing down of kahawai stocks. The BOPCB submits that experience available within the board suggests that kahawai biomass has reduced down to 25% of the stock size in 1962.
- 30 **Sanford** notes that there is information suggesting biomass in the mid-1990s was around 50% of virgin biomass (B_0), indicating a healthy kahawai resource at that time.

It submits that reducing commercial landings since 1996 has probably led to an increase in biomass since that time.

MFish response

- 31 The management arrangements proposed for kahawai under s 13 of the Act provide for maintaining the biomass of a fishstock at a target stock level, being at, or above, a level that can produce the maximum sustainable yield (MSY), having regard to the interdependence of stocks. MSY is defined, in relation to any fishstock, as being the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the population dynamics of the stock and any environmental factors that influence the stock. A requirement to maintain stocks at or above B_{MSY} is generally recognised internationally as being an appropriate fishstock target although there is some international support for B_{MSY} representing a minimum fishstock threshold level.
- 32 The IPP proposals were based on the assumption that kahawai stocks are currently at or above B_{MSY} .
- 33 MFish notes that you have discretion under the Act to manage (and set a specific target level for) a stock at or above B_{MSY} (s 13(2)(a)). If a stock is currently below the target stock level, there is a requirement pursuant to s 13(2)(b) to set a TAC that will result in the stock being restored to the target stock level (that is, at or above a B_{MSY}) in a way and at a rate which has regard to the interdependence of stocks and within a period appropriate to the stock, having regard to the stock's biological characteristics and any environmental conditions affecting the stock.
- 34 If the stock is above the target stock level, there is a requirement to set a TAC that will result in the stock moving towards the target stock level, or alternatively remain above the target stock level, having regard to the interdependence of stocks (s 13(2)(c)). In considering the way in which, and rate at which, a stock is altered to achieve the target stock level, the Minister is to have regard to such social, cultural, and economic factors as he or she considers relevant (s 13(3)). Section 13(3) makes it explicit that such factors are relevant in the determination of the way and rate of progress to the target level, rather than in the determination of the target stock level itself.
- 35 There is no set rate, or time frame, within which a rebuild or a "fishing down" of a stock must be achieved. However, the progress of moving towards the target stock level must be suitable to the fishery in question, having also considered those matters specified in s 13 of the Act.
- 36 MFish notes that rebuilding or maintaining an important recreational fishery at levels above B_{MSY} will theoretically provide benefits to recreational fishers in terms of increased abundance of the stock and hence increased availability to recreational fishers. Further a greater range of size classes will be available in the fishery improving the opportunities for recreational fishers to catch larger fish. MFish assumes that these benefits would also apply to customary fishers.
- 37 The benefits to the commercial sector from management above B_{MSY} are less apparent. There is some reduction in available yield at higher levels of biomass but

the commercial fishery could also benefit from improved availability of the stock(s) and the associated lower costs of harvesting in target fisheries. There are, however, costs associated with any reduction in catches that may be required to achieve a higher level of biomass.

- 38 MFish notes that environmental considerations also indicate that maintaining a higher biomass level for kahawai may also be desirable. However, in the case of kahawai there is no recent information on biomass nor is there sufficient information to identify a specific proposed stock level. In this case MFish is not able to provide quantitative estimates for any stock and management above B_{MSY} becomes a largely theoretical exercise. In the absence of this information MFish considers that a target level for kahawai stocks is not a crucial issue to determine at this time. Rather, you should consider the socio-economic benefits at various stock sizes in relation to the TAC options proposed for consideration.

Information used to calculate TACs

MFish initial position

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

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

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

Submissions

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

Use of the 1996 stock assessment

MFish initial position

- 43 The MFish initial view of the 1996 stock assessment was summarised in the IPP at paragraphs 116-124. In summary, a 1996 stock reduction model was used to obtain estimates of virgin and current biomasses and maximum constant yield (MCY) for a single nationwide kahawai stock. Recruitment was assumed to be deterministic for biomass estimation, but stochastic for yield estimation. Estimates of MCY were calculated for a single national fishstock using a model constrained to ensure that the biomass did not go below 20% of the unfished (or virgin) biomass (B_0) more than 10% of the time.
-
- 44 In the absence of information specific to kahawai, a number of parameter values used in the model were assumed or input as ranges. The natural mortality was one such parameter. In the IPP MFish proposed that a natural mortality of 0.2 for kahawai was the best available information and accordingly proposed that the historic MCY estimates based on that value were the best available. This was because analysis suggested the natural mortality for kahawai is unlikely to be higher than 0.2 and is likely to be close to this estimate.
- 45 Estimates of MCY derived from the 1996 model were generally regarded as conservative because some of the other parameters used as model inputs were based on maximum observed values. However, in the IPP MFish noted that the historic stock assessment contains important uncertainties, most notably the value used to reflect fishing mortality and the non-commercial catch history applied to the model.
- 46 A base case model using a 1996 estimate of recreational catch provided an MCY estimate of 7,600 tonnes ($MCY_{base\ case}$). Using different assumptions concerning the pattern and history of non-commercial catches of kahawai, a sensitivity analysis was undertaken where the non-commercial catch was extended back in time and was greater between 1945 and 1992 than the recreational catch used in the base case. This had the effect of increasing estimates of B_0 , and MCY and was the basis for the greater MCY estimate of 8,200 tonnes ($MCY_{sensitivity\ analysis}$).
- 47 MFish noted in the IPP at paragraph 24 that combined estimates of non-commercial and commercial utilisation for kahawai stocks were just within the estimates for MCY (7 600 and 8 200 tonnes) based on a natural mortality (M) of 0.2. MFish proposed setting combined TACs for fishstocks that coincidentally were consistent with the smaller of the two 1996 estimates of sustainable yield (ie 7 600 tonnes). The estimated levels of utilisation for all sectors combined could be accommodated within the proposed TACs and MFish therefore suggested there was no scarcity within the fishery and therefore no clear-cut requirement to consider reducing the current catch in the fishery. MFish noted that the initial proposals were based on the assumption that the stock is at or above B_{MSY} .

Submissions

- 48 **Sanford** submits that the methodology proposed for setting TACs for kahawai in the IPP is flawed and fails to properly apply the provisions of the Act. It submits that

TACs should be based on the use of best available information. It submits that the 1996 stock assessment is better information as it is based on an evaluation of the sustainability of the resource. Accordingly, Sanford proposes that TACs are set on the basis of the alternative MCY (8 200 tonnes).

- 49 Sanford notes that the stock assessment estimated that biomass in the mid-1990s was around 50% of virgin biomass (B_0), well above B_{MSY} (the biomass that provides the maximum sustainable yield), indicating a healthy kahawai resource at that time. It notes that the IPP conservatively estimated MCY to range between 7 600 and 8 200 tonnes.
- 50 It submits that the stock assessment, completed almost 20 years after the commencement of the kahawai purse seine fishery, indicated that the stock was being fished at conservative levels. Sanford notes that commercial catches over the decade leading up to the assessment averaged around 6 000 tonnes, while catches in the last decade have averaged less than 4 500 tonnes. It believes that the 1996 stock assessment remains the best available information and should be used as the basis for setting TACs. It submits support for combined TACs based on 8,200 tonnes on the basis that $MCY_{\text{sensitivity analysis}}$ was considered to be conservative.
- 51 **Non-Commercial Fishers** submit that it is not convinced that the critical values used in the 1996 stock assessment are correct. It submits that any TACs set should be based on the use of the best available information (for estimating MCY) and submits that this fishery should be managed above the biomass that will support maximum sustainable yield.
- 52 Non-Commercial Fishers note that the IPP preference is for the $MCY_{\text{base case}}$ of 7 600 tonnes. Further, the submission notes that $MCY_{\text{base case}}$ is based on a natural mortality of 0.20 and a model that allows fishing stocks down to a level of biomass that is less than 20% of virgin biomass. It submits that TACs should be set on the basis of the best available estimate of natural mortality, which it considers to be 0.18, and in addition must set out to manage this fishery above the biomass that will support MSY. It submits that recalculating MCY on the basis of $M = 0.18$ will achieve this. Non-Commercial Fishers submitted a revised estimate of MCY of 6 900 tonnes and recommended combined TACs for all fishstocks be based on this estimate.
- 53 **The RFC** submits that it does not consider that a reliable stock assessment can be carried out without a recruitment index for the fishery.

MFish response

- 54 MFish notes that both commercial and some recreational submissions support the use of the 1996 MCY estimates as a basis for setting TACs. However, submitters differ on which of the MCY estimate should be used. Sanford supports combined TACs for all fishstocks of 8 200 tonnes on the basis that $MCY_{\text{sensitivity analysis}}$ estimates were considered to be conservative and constitute the best available information. Non-Commercial Fishers recommend combined TACs for all fishstocks of 6 900 tonnes based on "revising" the $MCY_{\text{base case}}$ estimate using their preferred estimate of natural mortality ($M=0.18$), which they believe to be a key parameter in the model.

- 55 The historic stock assessment model used to estimate $MCY_{\text{base case}}$ was based on 1996 recreational harvest. Expert advice is now that the 1996 estimates of recreational catch are unreliable and should not be used. This is because of methodological problems with the 1996 survey.
- 56 It is possible that the 1996 survey under-estimated recreational catch but this is not certain. If this were the case then the effect on MCY estimates would be to increase them. This is demonstrated by the value of $MCY_{\text{sensitivity analysis}}$ (8 200 tonnes), which was determined from the model using higher values of recreational catch than those used in the base case model.
- 57 On the other hand, MFish notes that adoption of the Non-Commercial Fishers suggestion of using $M=0.18$ would alter the $M=0.2$ estimate of $MCY_{\text{sensitivity analysis}}$ (8 200) down to approximately 7 600. For $MCY_{\text{base case}}$ the reduction using $M=0.18$ would be from 7 600 down to approximately 6 600⁵.
- 58 MFish accepts that $M=0.18$ may be a more appropriate value for kahawai and notes that while it was not used in the historic assessment model (a range of values was used instead) it is reported in the Stock Assessment Plenary Report as the applicable value for kahawai. However, MFish notes that if the 1996 recreational catch was under-estimated, this counter balances the altered parameter for natural mortality to a degree. The effect of an *ad hoc* revision of the two parameters in response to stakeholder submissions leads MFish to conclude that a conservative estimate of MCY remains approximately 7 600 tonnes.
- 59 The simplistic historic assessment remains a reference point for a level of yield from the kahawai fishery. However, you should note that there is considerable uncertainty associated with the historic stock assessment and the resulting MCY estimates. It is also important to note that MCY will only maintain the stock at or above B_{MSY} if it is at or near this level already. If it is substantially lower then lower catch levels may be required to rebuild the stock.
- 60 MFish agrees with the RFC submission that recruitment variability is a potentially important factor that is poorly known. The 1996 assessment ran a broad range of recruitment sensitivities and selected 0.6 as a conservative value (high variability resulting in lower MCY estimates). The 1996 assessment report noted that recruitment variability may be high for kahawai and the establishment of a recruitment index would give one means of improving the biomass estimates. Attempts to establish a recruitment index for kahawai to date have not been successful.
- 61 As noted in this paper and in the IPP, there is considerable uncertainty regarding the historic assessment, which is now six years out of date. A new assessment of the kahawai stock is required.
- 62 The historic assessment utilised a basic modelling approach and did not incorporate any abundance index. New information is available that would allow further evaluation of critical parameters incorporated in the historic assessment (e.g. revised

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

catch histories and revised estimates of natural mortality). Tag data available at the time of the historic assessment could not be incorporated into that assessment.

- 63 Additional research has occurred since the historic assessment providing additional information that could be incorporated into a new assessment approach (e.g. catch-at-age sampling). Research is currently underway investigating one relative index of kahawai abundance and an index of recruitment (refer RFC submission). Additional research is soon to be contracted to investigate another relative index of kahawai abundance.
- 64 New assessment methods are available that can better utilise all of the available data, whether a relative index or indices are successfully developed or not, and a new assessment is therefore to be proposed for the 2005-06 year (with the historic approach repeated for comparative purposes only). Information from this assessment should be available for reviewing management arrangements for the 2006-07 fishing year.

Other sources of information

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

- 71 MFish notes the Sanford submission that it is axiomatic that harvesting will have led to a reduction in biomass. With a species such as kahawai that is highly visible because of its surface habit, it will be more noticeable to recreational fishers as the size of the stock is reduced towards B_{MSY} . Further, a reduction in the size of fish might be expected as larger older fish are removed during harvesting and replaced by smaller more productive fish. At issue is whether the biomass has declined to a point that a rebuild of the stock is necessary or desirable.

Estimates of commercial landings

MFish initial position

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

Submissions

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

MFish response

- 75 MFish confirms its initial view that using the most recent five years of commercial landings best reflects public policy considerations and other management measures already in place for the fishery. These considerations are reflected in current management arrangements and consequently the current use of the resource. Complete information is now available for the 2002-03 fishing year and MFish has incorporated this most recent year in determining average landings. This means that current commercial utilisation is defined by the average of the 1998-03 fishing years as compared to the use of the 1997-02 fishing years used in the IPP.
- 76 The information about the catch of each sector group also acts as a guide to the subsequent allocation of the TAC but current use need not determine allocations

within a TAC. The Minister makes a separate decision about allocation after setting the TAC.

- 77 The choice of commercial fishing years, intended to reflect current use in the fishery is an important consideration for two reasons. Firstly, within current proposals it determines the level of current use, which combined with that of other sectors, is assessed against sustainability considerations when determining TACs for the fishery. Secondly, the choice of years may affect the allocation of TACs and TACCs between stocks.
- 78 For example the change to include the 2002-03 year within the five-year average has the effect of reducing the average commercial catch for KAH 1 by 125 tonnes despite increasing the average for all kahawai stocks combined by 55 tonnes.
- 79 A more significant trend in the use of more recent commercial landings is the decline in landings in KAH 3 from the period 1993-94 to 1996-97 when compared to the period 1997-98 to 2002-03 (1998-99 is an exception). This change occurred because of a decline in the level of purse seining in the area of the stock. The use of a more recent period of commercial catch (as opposed to the 1991-97 period proposed by TOKM) results in lower TACs and TACCs for this kahawai stock. You should note the implications of the choice of recent years for determining commercial utilisation of kahawai.

Estimates of recreational landings

MFish initial position

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

Submissions

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

MFish response

- 85 Estimates for the recreational catch of kahawai have been derived from regional telephone/diary surveys conducted from 1991–92 to 1993–94, and three national telephone diary surveys undertaken in 1996⁶, 1999–00⁷ and 2000–01⁸.
- 86 The most relevant surveys are the three national telephone diary surveys. The results of these surveys are summarised in Table 3. The harvest estimates for 2000–01 are preliminary.
- 87 The 1999–00 survey for all fishstocks produced harvest estimates that were considerably greater (up to 300%) than the 1996 survey. Although the general methodology of using a telephone/diary survey was the same for all surveys, there were important differences in the details that could have accounted for the differences between estimates. An independent review advised caution in using the 1996 estimates as absolute harvest estimates without further analysis and also cautioned against the use of the estimates for QMA2 for the 1999–00 survey. These considerations lead MFish to conclude that the recreational use of kahawai lay in a range between 1996 estimates and 1999–00 and an average of the two was the best reflection of current recreational utilisation.
- 88 In determining an average between surveys to represent current recreational utilisation an adjustment of survey results was required to take into account specific new stock boundaries for kahawai. Catch estimates for KAH 2 and KAH 3 for 1999-00 were considered to be too high and were replaced by provisional estimates from the 2000-01 survey for this stock.
- 89 A meeting in December 2003 of technical members of the Recreational Working Group examined the methodologies used for each of the 1996, 1999-00 and 2000-01 surveys. The Recreational Working Group considered that the 1996 results should not be used as absolute estimates of recreational catch. Overall the estimates for 1996 were considered at that time to be substantially under-estimated. More recently the 1996 estimates are reported as containing methodological errors and they are considered to be unreliable. Given the size of the more recent estimates of recreational catch MFish considers that it is possible that 1996 estimates of recreational catch remain under-estimates.
- 90 More recent advice from the technical members of the Recreational Working Group is that the estimates of recreational catch from the 1999-00 and the 2000-01 surveys may be implausibly high for some important fisheries and have cautioned against their use.
- 91 MFish considers that the 1999-00 estimates of catch for KAH2 and KAH 3 are implausibly high and this is reflected in the approach adopted in the IPP to exclude these estimates from the average figures presented in the IPP and to use instead provisional estimates from 2000-01. This conclusion was based on a comparison

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

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

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

between surveys and between estimates for each stock. For example it was not considered to be realistic that the 1999-00 estimates of recreational kahawai catch for KAH 2 exceeded those for KAH 1 (refer Table 3). The recreational fishery in KAH 1 is generally considered to be much larger than any other area of the country.

- 92 For other stocks MFish notes that 1999-00 and 2000-01 estimates are substantially higher than those for 1996 but is not able to say that they are implausibly high. Given the technical concerns relating to the 1996 recreational harvest estimates and the absence of a current assessment model there are no other reference points for kahawai.
- 93 The recreational fishery for kahawai is either a target troll or lure fishery (based on surface or spatial aggregations of fish) or is taken as a bycatch of fishing using baited hooks. MFish notes that the 2000-01 harvest survey reported kahawai was the second most harvested finfish nationally and the SACEs survey reported that kahawai was the second most important of the five key recreational species it evaluated by value. It is possible that large catches could be realised by recreational fishers target fishing for kahawai. Further, the high recreational catch (estimates now exceed the commercial catch) may explain in part the recreational perceptions that stocks of kahawai have continued to decline in abundance despite the constraint on commercial catches.
- 94 However, to take account of the views of the technical members of the Recreational Working Group, MFish now proposes taking the lower of the 1999-00 and 2000-01 estimates for each kahawai stock as a basis for determining current recreational use for that stock and nationally.
- 95 Table 3 shows the recreational allowance as proposed in the IPP compared with the equivalent estimates of the recreational harvest for each QMA for the 1996, 1999-00 and 2000-01 surveys. Also shown in the table is the best estimate of current recreational use that MFish is able to construct from these surveys based on advice to date.

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

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

Based on preliminary results from 2000-01 national survey.

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

- 96 In conclusion, internal and external experts have reviewed the 1996, 1999-00 and 2000-01 recreational surveys. Since the IPP was released the Recreational Working Group has confirmed that the 1996 estimates contain methodological errors and should not be used as absolute estimates of recreational catch. Technical advice is

that even the results from the 1999–00 and the 2000–01 surveys should be treated with caution, as some estimates are implausibly high for some important fisheries.

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

Customary Māori catch

MFish initial position

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

Submissions

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

MFish response

- 103 In order to assess customary catch for the purpose of TAC setting, policy guidelines were used to determine what might be an appropriate allowance for customary Maori fishing. Maori consider kahawai to be a species of significant importance and in these circumstances guidelines suggest that an allowance in excess of estimated recreational catch is appropriate. Given the size of the estimated recreational catch MFish concluded that an allowance of 50% of this amount should be made. This estimation took into account the factors that could influence customary catch. These include the facts that:
- a) Kahawai are widely distributed in coastal waters, harbours and estuaries;
 - b) Kahawai are known to form seasonal spatial aggregations in some locations and form readily locatable schools in coastal waters;
 - c) Kahawai are accessible to customary fishers from shore and by boat; and
 - d) Kahawai is a preferred species for customary fishers in some areas.
- 104 While this estimate was intended for TAC setting purposes it was also the same level proposed as an allowance for customary fishing within the TAC.
- 105 It is important to note the distinction between allocation and TAC decisions. The MFish policy view is that when making decisions regarding an allowance to any sector you may take into account factors beyond actual catch. MFish notes that the allowance for customary Maori fishing is not intended to be constraining and should take into account the importance of the resource to that sector which may not be reflected by estimates of actual catch.
- 106 In this case MFish acknowledges that some Maori may chose to fish within recreational rules and their catch may be incorporated within current estimates of recreational harvest. However, MFish considers that there is evidence to support the historical importance of kahawai to Maori and it is likely that catches and catch rates by Maori have been greater because of targeting of this preferred species. The Motu River fishery is an example of a high catch rate seasonal fishery where kahawai were harvested for subsistence purposes.
- 107 New information is now available to suggest that recreational utilisation is larger than previously estimated. The most recent estimates of recreational harvest are now considered by MFish to be the best available to determine current recreational use with the result that increased estimates of use are now proposed for the recreational sector. MFish has re-evaluated the proportion of recreational use that could form an estimate of Maori customary fishing for TAC setting purposes and for the purpose of allowing for the interests of customary Maori fishers. An estimate and allowances based on 25% of the higher estimates of recreational utilisation are now recommended. This has the effect of reducing the estimate of customary Maori use and the Maori customary allowances from that proposed in the IPP by about 30% (refer Table 4).
- 108 It is important to note that this is intended as an estimate of customary use over and above any customary Maori fishing that may be included in recreational harvest estimates. MFish acknowledges that there is no quantitative information to support

this estimate and you will need to take this into account when determining TACs and subsequent allowances for customary Maori fishing within those TACs. The level of customary harvest becomes important if you decide to set TACs that reduce existing use in the fishery. As a matter of policy MFish recommends that customary use/allowances are not constrained or reduced in this circumstance and the burden of reduction on commercial and recreational fishers is therefore proportionally higher.

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

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

note nominal estimates/allowances for KAH 4 and KAH 10

Trends in utilisation

MFish initial position

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

Submissions

110 **Non-Commercial Fishers** submit that a more complete description of the commercial catch history is required than is provided in the IPP.

111 **Non-Commercial Fishers and Mark Feldman** submits that when quotas were imposed on other species in 1986 companies' diverted fishing effort onto those species not under quota, most notably kahawai. Submissions outline a scenario of largely unrestricted purse seine effort depleting kahawai fishstocks, particularly around the South Island. Further, these and many of the other non-commercial submissions state that the number of kahawai available to recreational fishers and the average size of kahawai have decreased over time. Submissions attribute these declines to purse seining.

112 **Non-Commercial Fishers** submit that the public have been concerned about the decline in kahawai since the late 1980s. Non-Commercial fishers acknowledge that a recent report on the size of kahawai taken by recreational anglers has not changed between 1994 and 2003 but say that the intention of the Minister in introducing catch limits for purse seining was to rebuild the fishery and there have been no signs that this has been occurring. Non-Commercial Fishers submit that accepting the dregs of an overheated purse seine fishery that was unconstrained until 1991 is not good enough and will not be accepted by non-commercial fishers, now or in the future.

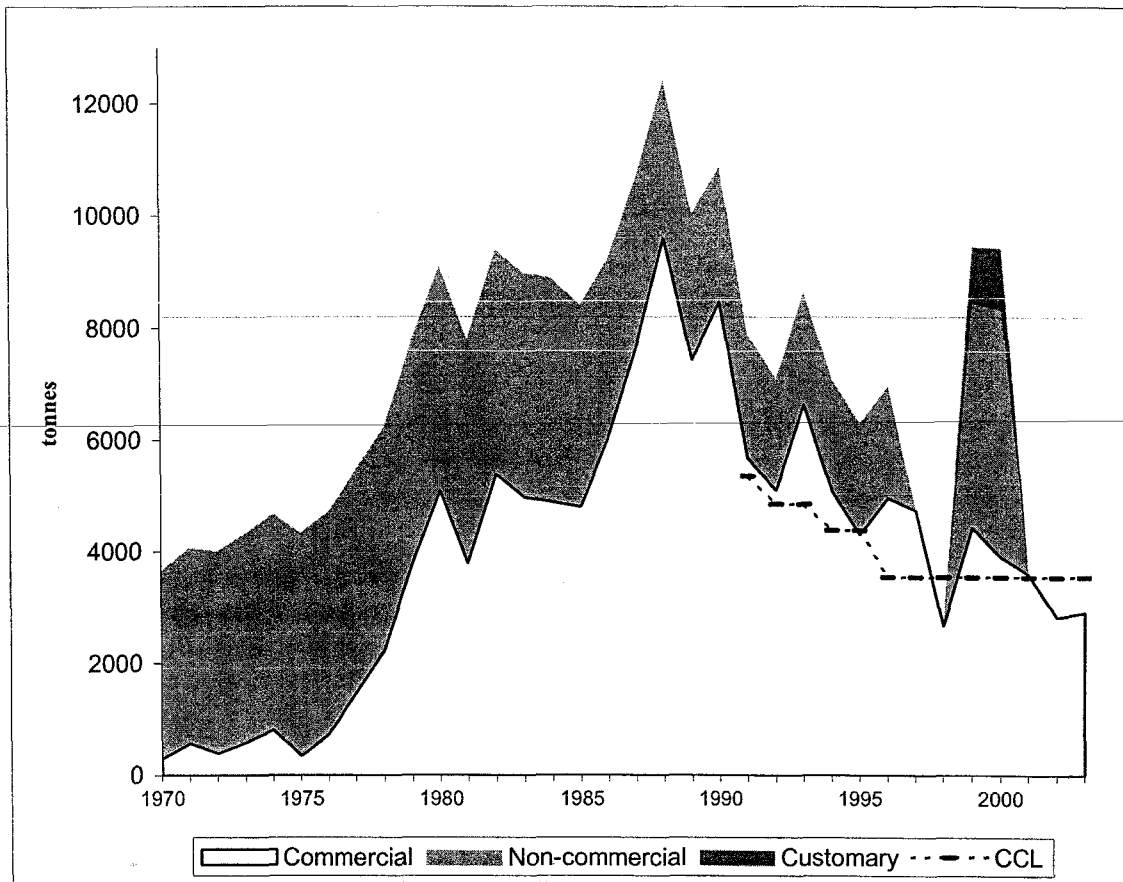
113 **Mark Feldman** submits that the IPP premise of associating declining commercial landings in KAH 3 with reduced purse seining in that area should not be accepted. He submits that it is naïve to believe that commercial fishers would stop fishing in KAH 3 for any other reason than reducing catch rates.

- 114 **Sanford** submits that commercial catches have been heavily constrained since the early 1990s by purse seine catch limits, seasonal restrictions, area exclusions and an agreement to avoid schools of immature kahawai.
- 115 Sanford submits that the decline in commercial landings since 1990 is most apparent in QMAs 3 and 8. It submits that the reduced landings in KAH 3 were due to reduced fishing activity resulting from the imposition of voluntary management measures. These it submits were:
- a) "a voluntary agreement to avoid fishing in southern Tasman Bay because of the importance of the area both to recreational fishers and as a feeding place for small kahawai; and
 - b) a similar voluntary agreement to cease fishing in Cloudy Bay and within one nautical mile of the coast north of Kaikoura. The latter area was an important part of the commercial fishery as kahawai schooled daily in this area as part of a diurnal migration between deep and shallow water, but were usually unavailable in deeper water".
- 116 **Sealord Group Limited** submits that historically it was responsible for the majority of kahawai landings from KAH 3. It submits that landings reduced when the cannery it supplied closed and its purse seine vessel was sold.

MFish response

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

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



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

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

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

Setting TACs

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

balance between the impacts of any reduction in current use and the increased certainty that the sustainability of kahawai stocks is ensured.

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

Evaluation of TAC options

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

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

TAC option and proponent	KAH 1	KAH 2	KAH 3	KAH 4	KAH 8	KAH 10	Total
IPP (not proposed)	3 910	510	960	18	1 210	18	7 625
MFish current utilisation	4 235	1 970	1 190	16	1 330	16	8 757
TOKM	4 600	1 780	1 970	18	1 210	18	9 595
Sanford	3 832	1 635	1 563	16	1 139	16	8 200
MFish proportional reduction	3 685	1 705	1 035	16	1 155	16	7 612
Non-Commercial Fishers	3 452	1 245	987	17	1 193	6	6 900
RFC / Feldman	3 390	1 160	915	16	1 188	16	6 685

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

Current utilisation MFish / TNIFCL / TOKM / Sealord

- 132 This option is intended to reflect the status quo management arrangements for kahawai and is based on revised estimates of current customary, recreational and commercial utilisation. MFish notes that the NIFCL supports the basis for assessing current utilisation (using revised values) and assuming that status quo management should continue. TOKM supports the basis for assessing current utilisation but prefers that the criteria years be 1992–97 for most of the fishstocks. Sealord supports the IPP basis for assessing current utilisation for KAH 1, KAH 2 and KAH 8 but submits that for KAH 3 current use should be based on the current CCL (1 500 tonnes).
- 133 Combined TACs for this option total 8 757 tonnes (9 595 for the TOKM proposal and 9 722 tonnes for the Sealord proposal). This level of utilisation is greater than the best available estimates of MCY for kahawai based on the preferred natural mortality parameter (7 600 and 8 200 tonnes). MFish retains its preference for the lower of

these two reference points as providing the best balance between the uncertainty in parameters (natural mortality) and inputs (recreational catch) used in the assessment model. While yield estimates are uncertain, as are some estimates of current utilisation (and you need to take this uncertainty into account), there is a level of risk to the sustainability of kahawai stocks if combined TACs are set at this level of utilisation in the fishery. The risk is that kahawai stock sizes will not be maintained at or above B_{MSY} .

Sanford

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

Proportional reduction, MFish

- 137 MFish considers that there is a case for a reduction in current use of kahawai because there is general uncertainty about the state of the stock.
- 138 Anecdotal information from recreational fishers suggests kahawai are less abundant. Anecdotal information is by its nature uncertain. The level of uncertainty should be factored into the weight you place on the information in determining your decision on TAC options. In this case MFish note that while the information is uncertain, the quantity of information from recreational fishers, and consistent concern expressed by submitters about the state of the fishery indicates the general concern recreational fishers have for the state of the stock.
- 139 In addition you should note the potentially important role of kahawai in the ecosystem, which might lead you into emphasising the need for caution in management.
- 140 MFish note that catch sampling and age structure data from the fishery are not providing information to support a recent decline in the size of fish in recreational catches and by implication biomass of the stock. The size and age of the fish sampled

has remained relatively constant. However MFish notes that catch selectivity may influence these indicators and they may not reflect trends in stock abundance.

- 141 Estimates of current utilisation are above the best available estimates of sustainable yield (7 600 and 8 200 tonnes). However the 1996 assessment is dated and uncertain. This uncertainty is compounded by potentially counteracting effects of:
- i) information on natural mortality which suggests the estimate used in the assessment might have been too optimistic; and
 - ii) new information on recreational catch which suggests that the 1996 recreational catch estimates used in the assessments are unreliable (catch by this sector may be higher than that used in the assessment which would tend to increase MCY estimates but this is not known).
- 142 Nonetheless, MFish consider there is sufficient information (anecdotal information from recreational fishers and stock assessment information) to consider a reduction to current landings. Given the uncertainty in information about stock status and information on sustainable yield MFish considers that a nominal 15% reduction to the level of current removals could be considered.
- 143 MFish note that a 15% reduction of current utilisation (to 7 612 tonnes) would move landings close to the MFish preferred estimate of $MCY_{base\ case}$ (7 600 tonnes) for the fishery. This estimate, although uncertain, provides the best indication of possible sustainable yield for the fishery at this time. MFish note that a further stock assessment using updated information is proposed (although not yet confirmed) for 2005. Information from this assessment, if it goes ahead, would be available for use in considering management options for the 2006–07 fishing year.
- 144 MFish acknowledges that this combined TAC option is based on an arbitrary reduction from current levels of use but considers that a reduction of this amount provides a balance between providing greater certainty that kahawai stocks will be maintained and the level of impact imposed on existing users of the fishery

Non-Commercial Fishers

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

around 25% from current levels of utilisation would be required to achieve fishing levels of 6 900 tonnes. MFish considers that on balance, this level of reduction is not required to ensure sustainability but notes that a reduction to this level would provide greater certainty that the kahawai stock would remain at or above B_{MSY} .

RFC / Feldman

- 149 This option is based on reducing commercial catch to a bycatch level only. MFish notes that the focus of this option is on allocating kahawai rather than on proposing sustainable limits on total removals from the fishery. However, by assuming current levels of utilisation for recreational and customary fishing and by basing the commercial component of TACs on bycatch levels a combined TAC total of 6,685 tonnes is suggested.
- 150 This proposal includes the proposition of removing the purse seine target fishery and discounting past commercial catches by this sector. This proposition is also contained in many email submissions as a result of the Option4 website. This proposal is considered more appropriately under the allocation section of this advice. With regard to the combined TAC level proposed, MFish advice is similar to that provided for the option of Non-Commercial Fishers.
- 151 There would be substantial economic consequences associated with this level of combined TAC. While MFish acknowledges that there would be more certainty that catches were sustainable MFish considers that this needs to be balanced against the level of impact on existing users. It is MFish's view that adopting this option would give undue weight to potential environmental issues and the anecdotal information of declining stock size, availability and size of fish and ignore other indicators that suggest no recent change in kahawai abundance.

MFish preferred TAC options

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

Option 1 (Current Utilisation)

KAH 1

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

KAH 2

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

KAH 3

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

KAH 4

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

KAH 8

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

KAH 10

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

Option 2 (Proportional reduction)

KAH 1

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

KAH 2

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

KAH 3

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

KAH 4

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

KAH 8

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

KAH 10

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

Impact of reduced TACs

166 If you accept the need for a reduction in the current level of utilisation to achieve levels of kahawai stocks that are sustainable in the long term you are required to have regard to such social, cultural and economic factors as you consider relevant when deciding on the rate at which stocks should rebuild. The interests of future generations are also an important consideration.

167 Submissions document how reduced TACs will impact on submitter's respective interests. Notwithstanding these impacts, there is common ground between non-commercial and some commercial sectors in their acceptance of the target levels used as a basis for managing kahawai. Both submitted support for setting TACs on the basis of MCY estimates.

168 There are socio-economic impacts of TAC options. The degree of impact in particular will depend on the allocation option you choose. Detailed consideration of economic impact is outlined in the sections on allocation.

169 MFish has assumed that the interests of customary Maori fishers are best served by an improvement in the availability of kahawai. MFish has proposed no reduction in allowance for customary Māori fishing under the proportional reduction option (reductions are proposed only for the recreational and commercial sectors) and considers that the benefits, or otherwise, to customary fishers of the TAC option proposed will be an improved ability to take kahawai within their allowance.

170 MFish concludes that the ability of Māori customary fishers to harvest kahawai within their customary allowance for the stock will be improved by reducing the landings of the other fishing sectors.

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

has considered the socio-economic impacts associated with TACC options later in this paper. The detail of impacts on each sector will vary for each stock. MFish notes that reduced TACs are proposed only for the main areas of fishing (KAH 1, KAH 2, KAH 3 and KAH 8).

Allocation

Introduction

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

resource most (downplaying the importance of past associations with the resource). As such it tends to have a focus on the present rather than the past.

- 182 Information available at the time suggested that current combined levels of utilisation were within the more conservative of the best available MCY estimates. Accordingly the IPP suggested there was no scarcity in the fishery and therefore no clear-cut requirement to consider reallocating the fishery between sector groups on the basis of utility value or any other consideration. However, that is no longer considered to be the case and if you accept the need for a reduction in the current level of utilisation to achieve levels of kahawai stocks that are sustainable in the long term you will need to consider the implication of making allocations when there are competing demands for the available resource.
- 183 MFish has a policy preference in this circumstance for a claims based allocation and recommends that reductions in recreational and commercial utilisation occur in equal proportions. As matter of policy MFish does not recommend a reduction in the allowance proposed for customary Maori fishing but notes that this allowance is based on an estimate of current customary use that is contested in industry submission.

Utility value of the kahawai fishery

MFish initial position

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

Stakeholder submissions

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

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

- 188 **SeaFIC** and **TOKM** contest the non-market valuation study used to derive estimates of recreational value (SACES). Both submit that the survey is flawed and has attracted academic criticism in the past.
- 189 **The RFC** notes that the SACES project found that kahawai have a greater value as a recreational fish than as a commercial fish and that kahawai is second only to snapper in terms of overall recreational value. It submits that these results reinforce the value and importance placed on kahawai by the RFC and to the recreational sector.
- 190 **Non-Commercial Fishers** notes that while the commercial value is \$1 700-\$5 100 per tonne (an estimated provided in the IPP) it submits that the value of most purse seine caught fish would be at the lower end of this range. A body of supporting submissions oppose the commercial use of a fishery highly valued by recreational fishers.
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MFish response

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

Allocation principles

Stakeholder submissions

- 193 Industry submissions strongly oppose anything other than a claims based approach to setting allowances and TACCs. Submissions from commercial fishers and their representative organisations may be summarised as follows:
- a) Information on utility was highly uncertain and techniques used to estimate utility flawed;
 - b) Use of utility had the potential to undermine the QMS and the integrity of ITQ; and
 - c) A claims or catch history based allocation framework provides more certainty.
- 194 **TOKM** supports the principle of catch history for allocating catch between sectors and considers that use of utility without compensation could be considered bad faith because it would undermine treaty settlement assets.
- 195 **The Bay of Island Charter Fishing Association** and **Tony Orman** supports managing kahawai as a tourist-recreational fish. Tony Orman submits that kahawai is potentially an economic resource of far greater magnitude than the earnings from purse seining, if designated as a recreation and sports fish. His submission notes that

Sanford employ 100 people associated with purse seining but submits that one fishing lodge could generate an equivalent number of jobs with just twelve rooms (using what he states as the accepted factor of eight jobs per tourist bed per night).

- 196 Other recreational submissions generally refer to the fact that kahawai is highly valued by that sector citing either social or economic values associated with the fishery that they believe outweigh those of the commercial sector.

MFish response

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

Māori customary allowance

MFish initial position

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

Stakeholder submissions

- 202 **Sanford** submits that the Maori customary allowance proposed in the IPP is excessive. Other aspects of its submission on the Maori customary allowance are addressed in the preceding section on Maori customary utilisation.
- 203 **Non Commercial Fishers** submit that a component of customary fishing is contained in recreational harvest estimates but that customary allowances should be based on 50% of the recreational harvest estimates to ensure that Maori have a priority access to kaimoana.

- 204 **Harry Toi** (on behalf of Ngati Hapu, Ngati Kopaki, Ngati Kopaki, Ngati te Ara, the Ngati Kopaki, Ngati TeAra Trust) submits that the allocation process is not conducive to the sustainability of the resource for tangata whenua. He submits support of the need for assessing impacts of the social and economic situation of tangata whenua before allocating quota.
- 205 **Wayne Taylor** (on behalf of Ngāti Kahungunu, Ngāti Pahauwera and Moeangiangi 42 N owners) submits that kahawai has special spiritual, cultural and historical significance for them. Wayne Taylor notes that one of sub tribes of Ngāti Pahauwera was known as the Kahawai tribe and derived a particular spiritual connection to kahawai.
- 206 **Te Runanga o Otakou** notes that the Minister is required to develop policies to help recognise the use and management practices of takatā whenua in the exercise of customary non-commercial fishing rights. Te Rūnanga o Ōtākou requests that a minimum of 25% of the TAC be provided as a non-commercial allowance, of which 80% should be provided as a customary allowance.
- 207 **John Horan** submits that his whanau have coastal land of Maori heritage. He has supplied the elderly and his family for almost 20 years and he states that they rely on kahawai. He wants to continue supplying the needs of his extended family but submits that there has been a decline in kahawai at Whatuwhiwhi over the years that he attributes to commercial fishing.

MFish discussion

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

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

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

Recreational allowance

MFish initial position

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

Stakeholder submissions

213 The **RFC** submits that no recreational allowances should be set until better information becomes available.

214 **Non-Commercial Fishers** propose that the allowances should be based on the results of the most recent survey. Submissions state that an error in the 1996 recreational harvest survey allowed for many refusals in the survey to be counted as non-fishing households. Accordingly, it submits that incorrect harvest estimates must not be used as a basis for how much kahawai is allowed for by recreational fishers.

215 Non-Commercial Fishers submits that as a source of food, learning or sport, kahawai are highly valued by recreational fishers. It submits that the fishing experience for kahawai provides a thrill for anglers of all ages.

216 **Sanford** also opposes the MFish proposed allowances. Sanford submits that the 1996 survey alone should be used to determine an allowance as the most recent survey has yet to receive full review and acceptance.

217 **SeaFIC** and **TOKM** strongly oppose the setting of recreational allowances on the basis of a transfer of value away from the commercial sector.

MFish discussion

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

219 There is no constraint (within the scope of the Act) on the basis upon which you can decide to allocate the TAC or on the quantum you elect to allocate to each sector. As noted previously, it is important for you to have regard to the relevant social, economic and cultural implications when making your decision. MFish considers that

landings history information is a more certain basis for allocation than utility. Utility information for kahawai is uncertain. You should weigh this uncertainty when considering the use of utility information as a basis for allocations for kahawai.

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

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

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

Recreational and customary allowance combined

* Wait for better information

Management of recreational landings

MFish initial position

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

Stakeholder submissions

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

MFish discussion

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

TACC

MFish initial position

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

Stakeholder submissions

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

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

MFish discussion

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

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

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

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

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

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

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

Loss of economic return

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

Restructuring costs

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

Reference points

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

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

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

Estimates of loss of economic return

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

price for kahawai but in the absence of any alternative asset values provided by submissions, consider these to be the best available information.

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

266 An alternative to the payment of deemed value when there is insufficient ACE to cover bycatch is that fishers could stop fishing for their target species. MFish is not aware of any current situation where the landing of target species is constrained by the level of bycatch TACCs. Typically when landings are taken in excess of the bycatch TACC deemed values are paid. Accordingly, MFish does not consider there will be any potential costs of foregone fishing for associated species due to kahawai bycatch limitations.

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

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

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

Conclusion

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

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

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

- 271 MFish notes that adopting the Sanford option will increase economic returns in comparison to current levels of utilisation.
- 272 Adopting the proportional reduction option will result in forgone port price earnings and quota value of 15% in comparison to current utilisation. In addition, MFish notes that adopting a proportional reduction of commercial catches in KAH 8 reduces the TACC below the average landings of bycatch. This would mean incurring the payment of deemed values for this overcatch. The level of bycatch is variable and catches have exceeded the proposed TACC in only four of the past fifteen years. Nevertheless, on average deemed value payments of \$58 000 per annum might be expected by adopting TACCs that are proportionally reduced.
- 273 MFish concludes that apart from forgoing annual economic returns and asset values with respect to setting TACCs at the greater values of the Sanford and current utilisation options, the only other impact incurred by setting TACCs at the level of the proportional reduction option is in KAH 8, where deemed values may be occurred from over catching kahawai as a bycatch in some years.
- 274 Adopting the Non-Commercial Fishers option will result in concomitant forgone port prices and quota value of about 25% in comparison to current utilisation. In addition, MFish notes that adopting this proposal would reduce the TACC below the average landings of bycatch in KAH 2, KAH 3 and KAH 8. This would mean incurring the payment of deemed values for this overcatch.

Allowances for other sources of mortality

MFish initial position

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

Submissions

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

MFish response

- 279 The IPP proposal was based on a nominal value for one particular method of commercial fishing. MFish does not agree with Sanford that purse seining is completely benign and in the event of gear problems all fish are unharmed. Reports

suggest that schools sometimes merge dragging the gear under water and allowing kahawai to escape. The trauma associated with this is likely to cause incidental mortality. MFish notes the submission of Non-Commercial Fishers that other commercial methods also result in incidental mortality. However, MFish believes that any assumptions relating to wider application of this allowance should also extend to recreational fishers (that are known to practise catch and release resulting in further unknown levels of incidental mortality).

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

Other management measures

Method restrictions

MFish initial position

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

Submissions

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

MFish response

- 286 The IPP noted that a number of time and area constraints on purse seining are in place as voluntary arrangements. While there is a need for a review of spatial management arrangements for kahawai in the near future, MFish considers that spatial arrangements are matters for stakeholders to address.
- 287 Once kahawai is introduced into the QMS, commercial stakeholders (quota owners) will be more readily identifiable and MFish anticipates that the development of stakeholder management arrangements will be facilitated. This will in turn improve the prospects of stakeholder agreed resolution to any concerns regarding spatial conflict that may occur in the fishery.
- 288 In addition the dispute procedures of the Act are available at any stage if recreational fishers consider that their fishing interests are adversely affected by commercial fishing.
- 289 The approved dispute procedure is intended to provide a process for stakeholders to resolve disputes without recourse to regulation. If a dispute remains unresolved the Minister of Fisheries can be asked to resolve that dispute. An important element of the dispute procedure is that if one party to the dispute decides not to participate in the process the Minister of Fisheries can still be asked to make a determination.
- 290 With regard to the RFC submission that the closure of the Hauraki Gulf to purse seining should be regulated, MFish notes that this closure has operated effectively as a voluntary arrangement for a number of years without recourse to regulation. The ability to regulate such a measure other than for sustainability purposes is limited unless it is the outcome of a dispute procedure. To date no such procedure has been initiated for kahawai. A similar situation applies for the other closure to commercial fishing proposed in the submission of the Kaikoura Boating Club.
- 291 With regard to the submission of Wayne Taylor that an extension to the closure to commercial fishing would provide protection for kahawai (and other species) in Hawke Bay, MFish notes that the sustainability benefits of a spatial closure are not clear given the pelagic and migratory habits of kahawai. MFish considers that the key measure required ensuring the sustainability of kahawai is the setting of TACs at an appropriate level.

Deemed value and overfishing thresholds

MFish initial position

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

Submissions

- 294 **TOKM and SeaFIC** both submit that kahawai should be classed as an “all other fishstocks” for deemed value purposes and that the annual deemed value should be based on 75% of the port price for kahawai. Further, TOKM sees no need for the application of differential deemed values or overfishing threshold for kahawai.
- 295 **NIFCL** strongly oppose the unilateral departure from the deemed values policy framework to apply a factor of 200% of the port price for deemed values. NIFCL submit that kahawai clearly fits within the “all other fishstocks” category and 75% of the port price should apply to this species.
- 296 **Non-Commercial Fishers** submit that if the catch history of the purse seine target fishery is removed then the deemed value could be set at \$0.32. Otherwise the deemed value must be set at \$0.86.

MFish response

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

Table 11: Proposals to set deemed values for kahawai:

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

Consequential amendment to regulation

MFish initial position

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

Submissions

301 Industry submissions support the proposal.

MFish response

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

Legal Obligations

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

Conclusion

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

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

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

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

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

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

are reflected in the current management arrangements for the fishery and current catch.

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

- b) 1996 information on status of stock relative to B_{MSY} (50%);
 - c) considerable uncertainty in the estimates of yield and stock status for kahawai;
 - d) some agreement by sectors for a target stock level above B_{MSY} ;
 - e) a commercial view that there is no evidence of declining recreational catches, numbers of schools of kahawai or changes in the level of bycatch in recent years;
 - f) a strong recreational perception about declining abundance, availability and size of fish in the main stocks both long term and in recent years;
 - g) a revised estimate of MCY submitted by Non-Commercial Fishers (6 900 tonnes) as a basis for combined TACs; and
 - h) the important role of kahawai in the ecosystem.
- 319 The MFish preferred TAC options are to either base combined TACs on current utilisation or on an arbitrary 15% reduction in recreational and commercial use of key kahawai stocks (KAH 1, KAH 2; KAH 3 and KAH 8). If you consider that current utilisation is at levels that present a risk to the stock you might consider that in these circumstances a reduction is indicated. A level of reduction of 15% of current utilisation is recommended. Such a level is significant but it is proposed as a balance between certainty and impact. Should you consider that an alternative combined TAC should be considered then TAC options proposed by stakeholders are available for your consideration.
- 320 MFish notes that the TAC option based on a reduction of current utilisation will have socio-economic impacts on commercial fishers. For example, Sanford emphasise the importance of kahawai to their purse seine operations. Management intervention will also be required to constrain recreational catch if you elect the lower of the TAC options proposed. These impacts should be considered along with weighting of the uncertain information on stock status when making your decision and you should take into account the fact that, while a new stock assessment of kahawai is planned, results will not be available for consideration until the 2006–07 year.
- 321 The IPP and this FAP contain discussion on the use of alternative options when considering how to allow for non-commercial use– the “claims based” and “utility” approaches. The policy discussion on utility and claims based approaches is not intended to fetter your discretion, but rather provides policy guidance in order to provide a more robust framework when considering allowances.
- 322 The utility model is strongly opposed by industry and TOKM on the basis that this approach has the potential to undermine the QMS, the integrity of ITQ, and in the case of TOKM the 1992 Deed of Settlement. The basis of much of the non-commercial opposition to commercial fishing for kahawai (and purse seining in particular) is based on the perception that they value the fishery more highly than commercial fishers.
- 323 MFish considers that there is subjectivity attached to consideration of both catch history and utility options. The period chosen for commercial catch history and estimates of non-commercial catch are contentious. MFish considers that much of the critique of the utility concept can be addressed however MFish confirms its view

(acknowledged in the IPP) that there is a great deal of uncertainty attached to quantitative assessments of value. You should weight this uncertainty if you consider the use of utility information as a basis for determining allocations for kahawai.

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

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

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

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

Recommendations

328 MFish recommends that you

- a) **Note** the contents of this advice and attached stakeholder submissions on kahawai management proposals;
- b) **Note** that the information regarding the status of kahawai stocks is uncertain;
- c) **Note** that having regard to the uncertainty surrounding stock status, MFish has a preference for the lower of the TAC options proposed;
- d) **Note** that having regard to the uncertainty in estimates of utility for kahawai, and the views of stakeholders, MFish has a preference for the allowances and TACCs within the lower of the TACs proposed to be determined in proportion to the current use of recreational and commercial sectors; and

EITHER

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

- iv) A TACC of 680 tonnes.
- j) **Agree** to set a TAC of 16 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 1 tonnes;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 10 tonnes.

OR

- k) **Agree** to set a TAC of 3 685 tonnes for KAH 1 and within that TAC set:
 - i) A customary allowance of 550 tonnes;
 - ii) A recreational allowance of 1 865 tonnes;
 - iii) An allowance for other fishing-related mortality of 75 tonnes; and
 - iv) A TACC of 1 195 tonnes.
- l) **Agree** to set a TAC of 1 705 tonnes for KAH 2 and within that TAC set:
 - i) A customary allowance of 205 tonnes;
 - ii) A recreational allowance of 680 tonnes;
 - iii) An allowance for other fishing-related mortality of 35 tonnes; and
 - iv) A TACC of 785 tonnes.
- m) **Agree** to set a TAC of 1 035 tonnes for KAH 3 and within that TAC set:
 - i) A customary allowance of 125 tonne;
 - ii) A recreational allowance of 435 tonne;
 - iii) An allowance for other fishing-related mortality of 20 tonne; and
 - iv) A TACC of 455 tonnes.
- n) **Agree** to set a TAC of 16 tonnes for KAH 4 and within that TAC set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 5 tonnes;
 - iii) An allowance for other fishing-related mortality of 0 tonnes; and
 - iv) A TACC of 10 tonnes.
- o) **Agree** to set a TAC of 1 155 tonnes for KAH 8 and within that TAC set:
 - i) A customary allowance of 125 tonnes;
 - ii) A recreational allowance of 425 tonnes;
 - iii) An allowance for other fishing-related mortality of 25 tonnes; and
 - iv) A TACC of 580 tonnes.
- p) **Agree** to set a TAC of 16 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 5 tonnes;

- iii) An allowance for other fishing-related mortality of 0 tonnes; and
- iv) A TACC of 10 tonnes.

AND

- q) **Agree** to set annual deemed values of:
 - i) KAH 1 \$0.66 / kg; and
 - ii) KAH 2, 3, 4, 8 & 10 \$0.61 / kg.
- r) **Agree** that differential deemed values apply.
- s) **Agree** to amend the Fisheries (Reporting) Regulations 2001 to outline the codes to be used by fishers when completing their statutory catch returns.
- t) **Note** that once kahawai becomes subject to the QMS fishing permit conditions applying purse seining catch limits and vessel restrictions on the taking of kahawai will no longer be applicable. Accordingly, the chief executive will revoke these fishing permit conditions.
- u) **Note** that if you elect to reduce the current use of kahawai MFish will initiate consultation with the recreational sector to determine the best method of achieving the required catch constraint.

ANNEX ONE

Other sources of information

MFish initial position

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

Submissions

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

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

Table 13: Number of option4 responses by fishstock

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

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

Years of fishing	>20	11-20	5-10	<5	
Percentage	76.8%	15.0%	6.2%	2.0%	
Days fishing per year	>50	21-50	10-20	<10	
Percentage	21.6%	49.9%	25.7%	2.8%	
Stocks of kahawai have	declined a lot	declined a little	remained the same	increased a little	increased a lot
Percentage	88.1%	10.2%	1.5%	0.2%	0.0%
Size of kahawai have	increased		remained the same	decreased	
Percentage	0.8%		17.3%	81.9%	
Numbers of feeding schools are	much more frequent	more frequent	same number	less frequent	much less frequent
Percentage	0.2%	0.7%	2.6%	33.9%	62.6%

- b) Summary of option4 email respondents is as follows with the response rate in brackets.
- i) I support the option4/NZBGFC submission to restore the non-commercial kahawai fishery:
 - Yes (1 443)
 - No (10)
 - ii) Do you think management objectives for kahawai should focus on restoring non-commercial access to a healthy fishery?
 - Yes (1 426)
 - No (22)
 - iii) Should Commercial Fishing companies be targeting kahawai with purse seiners and spotter planes and then exporting their catch to low value markets (such as Australia for crayfish bait where it sells for about \$A1.20 per kg?)
 - Yes (11)
 - No (1 450)
 - iv) Should fishery managers discount the catch history of bulk fishing practices before they make quota allocations to commercial fishers?
 - Yes (595)
 - No (694)
 - v) What level would you like to see the kahawai fishery managed at?
 - there should be more kahawai available (1 165)
 - its about right (73)
 - there should be less kahawai available (209)
 - vi) Would you like to see commercial catches of kahawai
 - increase (2)
 - stay the same (85)
 - decrease (1 389)

c) Fishing competition catch records and Club reports:

i) New Zealand Angling Limited Event Catch Records

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

ii) Club reports

The RFC reports that while there has been no change to the state of the kahawai fishery in the past twelve months, clubs fishing KAH 1 at Whakatane, Opotiki, TeKaha and Waihou Bay all reported poor tournament results for kahawai. A tournament at Mount Maunganui of 115 anglers caught 57 kahawai and at Waihou Bay 92 anglers caught 9 kahawai.

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

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

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

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

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

- i) Catch data for the Motu River Mouth has also declined;

- ii) Any reasonable person would conclude that a catch of 0.4 kahawai per angler per trip to be a very poor catch rate; and
 - iii) The CPUE of snapper is three times greater than kahawai and it is well known that the snapper fishery is below B_{MSY} in the north.
- 331 The **RFC** submits that purse seining has been responsible for an overall decline in the stock status of kahawai. It submits that intensive purse seining in the Bay of Plenty and the top of the South Island has resulted in an overall decline of kahawai around the entire coast of New Zealand. This is explained by a “sink” hypothesis whereupon concentrated purse seining in hotspots creates a void into which kahawai from other areas ultimately sink. The RFC submits much of the same evidence to support their views as provided by Mark Feldman, apart from an additional point about Kaharoa trawl survey data.
- a) Kaharoa trawl survey data. The RFC cites a report summarising trawl survey results between 1982–93 (biennial trawl surveys were undertaken by the Ministry of Agriculture and Fisheries research vessel *Kaharoa* during this period). These research data suggested declining mean lengths of kahawai taken in trawl surveys on the west coast North Island and the Bay of Plenty during this period. The RFC submits that there may be two explanations for this reported decline:
 - i) A major increase in recruitment; and
 - ii) A major increase in the removal of adults (overfishing).

The RFC submit that recruitment indices for the Hauraki Gulf suggested poor recruitment during 1981, 1984, 1996 and for each year between 1987–91. Accordingly, the RFC concludes that decreases in mean lengths cannot be due to recruitment of small fish and so are most likely due to overfishing of the larger fish by purse seining.
- 332 **Non-Commercial Fishers** submit that there was considerable concern from recreational fishers about the disappearance of kahawai 15 years ago. The Minister shared that concern in the early 1990s because purse seine catch limits were introduced.
- 333 However, **Non-Commercial Fishers** submit that there is no evidence of a rebuild of fishstocks as reflected by non-commercial catch rates since. Catch rates of kahawai from the 1996 national boat ramp surveys show that fishers who report targeting kahawai catch just 0.79 kahawai per hour - in other words five hours fishing for four fish. Fishers who say they were targeting snapper on their trip (most trips in the north) caught just 0.11 kahawai per hour – in other words nine hours fishing for one kahawai.
- 334 **Sanford** notes that recreational fishing organisations have suggested that kahawai catch rates have declined substantially in all areas, and that this indicates a substantial decline in kahawai abundance due to high levels of commercial catch. Sanford submits there is a lack of data to support this assertion.
- 335 Sanford say that it is axiomatic that harvesting a fish stock will lead to a reduction in biomass, but submits that other factors (such as increased recreational fishing pressure and land use changes) will also affect kahawai availability in near shore waters. If

kahawai stocks were under pressure, one would expect to see other signs of this, such as a reduction in the proportion of older fish, or reductions in catches by non-target fishing methods. In support of these statements Sanford submits:

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

MFish response

Recreational fishing perceptions

- 336 Option4 respondents identified areas they fished and were able to choose any number of QMAs. Responses as a percentage of the totals are: QMA 1 (58%); QMA 2 (12.5%); QMA 3 (0.5%); QMA 8 (24%); QMA 4 and 10 attracted few responses. In comparison to the 2000-01 recreational diary results these proportions suggest that fewer QMA 2 and QMA 3 anglers, and a higher proportion of QMA 8 anglers, responded to the option4 website than might be expected.
- 337 Over 90% of Option4 respondents indicate that they have 11 or more years of fishing experience with over 70% having fished for 21 or more days a year, although it is unknown what species they might have been fishing for.
- 338 Almost 82% of respondents indicate that kahawai has “decreased” in size although 17% considered size has “remained the same”.
- 339 63% of respondents consider that the numbers of feeding schools are “much less frequent” in terms of their experience and 34% “less frequent”. MFish notes that 70% of respondents report their level of experience exceeding 20 years (before the introduction of purse seine catch limits). Nevertheless, only 2.6% of respondents report “about the same number” of schools in their experience and less than 1% reports any improvement.
- 340 88% of respondents indicate that they perceive stocks of kahawai have “declined a lot” and 10% that stocks have “declined a little”. This compares with a 1997

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

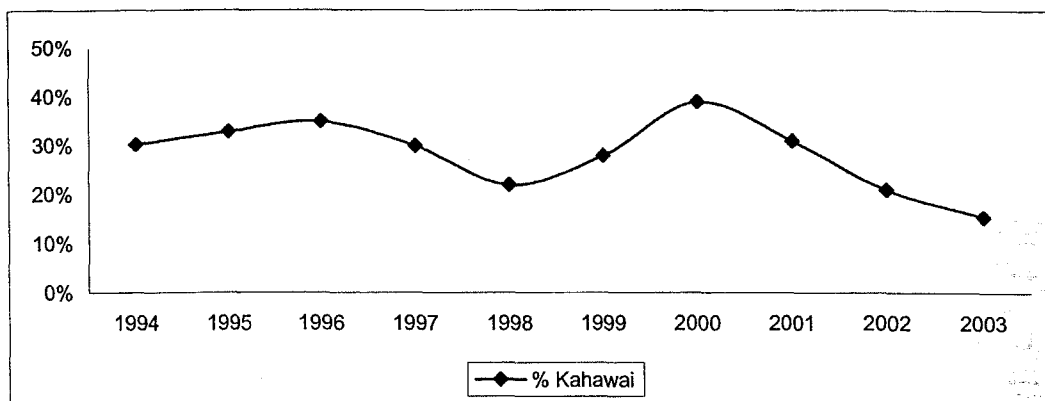
readership survey recording 47% of its respondents indicating that stocks had “declined significantly” and 32% that stocks had “declined a little”. This suggests that not only has the total percentage of respondents perceiving stocks to have declined increased by 10% but that a greater percentage of respondents believe that this decline is more substantial than respondents did in 1997.

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

Fishing competition Catch Records

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

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



- 343 The proportion of kahawai caught in proportion to other species varied between 1994 and 2000. The proportion of kahawai to other species peaks in 2000 probably as a result of anglers’ more actively targeting kahawai in comparison to other species as a result of the new dedicated tournament for kahawai. Since 2000 the ratio has declined.

- 344 Further interpretation is confounded by not knowing whether fishing patterns were maintained over this period. MFish notes that the number of kahawai caught per angler has reduced only slightly between 1994 (4.6 kahawai per angler) and 2003 (4.4 kahawai per angler). This suggests that the declining proportions of kahawai could be attributed to increased catches of other species.

Tagging analysis

- 345 MFish notes that the objective of tagging studies in the 1990s was to study the movements of kahawai and not to measure the proportion of catches by the fishing sectors. Any detailed analysis of tagging returns relies on tagged fish becoming well mixed within the wider population. However, the 1990s tagging studies were largely inconclusive because of the effect of tagging on kahawai physiology and behaviour. In addition, all tags recovered were not returned and the fishing effort distribution of

the sectors was not the same. Accordingly, MFish does not consider the lack of any discussion of the tagging data to be a major omission from the advice. Neither does MFish consider that these data are useful for determining the relative proportion of catches by sector groups as suggested by submissions.

Length based studies

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

Recreational catch per unit effort (CPUE)

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

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

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

Commercial aerial sightings data

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

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

Commercial Bycatch

- 356 MFish does not agree with industry submissions that there is evidence of a stable bycatch CPUE and hence a stable stock abundance. There is a body of literature that has examined the assumption that changes in CPUE will, to some extent, reflect changes in stock abundance. However, the assumptions involved cannot always be tested and bycatch CPUE is not often a useful indicator of abundance in these types of fisheries. Where different target fisheries and fishing methods are combined, as is the case for kahawai, standardisation of the data will be required.
- 357 Careful consideration and standardisation of the measure of fishing effort and other factors are required for CPUE analysis to be useful. Trends in catching ability need consideration, as changes in fishing practice can contribute to changes in landings over time (an effect that may not be able to be disentangled from trends in abundance).
-
- 358 The use of CPUE analysis is much more problematic for a bycatch fishery. This is particularly so when, as is the case with kahawai, bycatch numbers and weight are relatively small per unit of effort.

ANNEX TWO

option4 Alert #6 - April 2004

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

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

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

Have your say - Click here

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

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

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

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

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

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

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

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

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

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

Otherwise keep reading - it only gets worse

Why is option4 so outraged

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

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

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

there is no scarcity of kahawai

there are no problems caused by purse seine fishing

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

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

Even if they did believe us, they –

do not accept there is any scarcity of kahawai

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

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

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

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

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

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

Ministry are

not talking about rebuilding the fishery

not talking about leaving it where it currently is

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

continuing to aggravate the conflict between non commercial and commercial fishers

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

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

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

avoid allocation scandals such as we have seen with scampi

escape compensation issues by over allocating kahawai to the commercial sector

avoid having to make management decisions.

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

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

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

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

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

Have your say - Click here now!

TAKEN

Your Kahawai are being caught by commercial fishers

And they are not giving them back

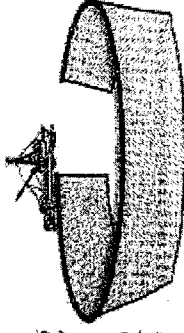
In fact fishing companies are demanding an increased commercial kahawai catch when this species goes on quota

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

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

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

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



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

Name _____

Address _____

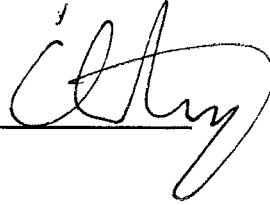
Town _____

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

JH 4

This is the document marked **JHI 1** mentioned and referred to in the affidavit of **JONATHAN CLIVE HOLDSWORTH** sworn at Auckland this 26th day of August 2005 before me:

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S
AUCKLAND
Campbell Robert Pentney
Solicitor
Auckland



Solicitor of the High Court of New Zealand

JH4

Speech: David Benson-Pope To The 2005 NZ Recreational Fishing Council AGM And Conference

Press Release by New Zealand Government at 11:13 AM, 08 Jul 2005

Friday 8 July 2005 - 10.30-10.45am - West Plaza Hotel, Wakefield Street, Wellington

Kia ora Tātou. Good morning, and thank you for inviting me to address your conference.

I am pleased to be here again. I want to take this opportunity to talk to you about the sector, and how it might move ahead over the next three years.

I would like to acknowledge the value and contribution that recreational fisheries make to the New Zealand way of life. This is a theme I would like to return to in some of the aspects I will talk to you about today - how we value recreational fishing.

There is no doubt that the pleasure of fishing for recreation is something enjoyed by many New Zealanders. Be it fishing with the kids off a wharf; scuba diving for crayfish; or searching the swells for a big-game marlin; that's about catching fish and the pleasure of all that goes with it.

This is a diverse and complex sector. Estimates suggest approximately 20 per cent of New Zealanders participate in recreational fishing. Recreational fishing also attracts foreign tourists.

This operating environment requires that our fisheries resources and the aquatic environment must be managed with care so that current and future generations can continue to enjoy the benefits of well-managed fisheries.

The theme of your conference - 'shared responsibility' is central to addressing these issues and enabling benefits to be delivered to all users.

The Government will continue to set the context and boundaries within which fisheries management occurs.

This involves describing the outcomes or results that we want to see from the management of fisheries. It also means developing more detailed objectives for particular fisheries.

To be successful, this process requires the participation of strong stakeholder groups; groups that are able to work together to not only define a common purpose for managing a fishery, but also to be involved in its management.

This challenge involves building organisations that have the skills and structures to play a more active role in formulating management objectives and interventions.

I am pleased that the government has taken steps to support recreational fishers in developing capacity and participation in fisheries management.

One key initiative is the establishment of a Recreational Fishing Ministerial Advisory Committee. I am sure Peter Ellery; Sheryl Hart; Max Hetherington, Lorraine Hill; Bob Meikle; Geoff Rowling; and Kim Walshe will make a valuable contribution.

I was encouraged by the strong interest shown in the establishment of this committee and the high calibre of the sixty-nine nominations that were received.

A parallel initiative is the reestablishment by the Ministry of Fisheries of nationwide regional recreational forums.

These regional forums will be 'representative' of local fishing groups and will enable improved participation in statutory fisheries management processes.

Both developments are about recreational fishers participating more directly in fisheries management.

Engagement with the recreational fishing sector takes place against a backdrop of increasing demand on the use of 'shared' fisheries resources. The challenge is to manage the question of allocation in a constructive way

This is where some of the toughest decisions are made and where the concept of 'shared responsibility' really matters. A little later in this speech I will talk specifically about one species - and two paths that are available to manage it.

The government has been investing in initiatives that will provide us with more information about fisheries and their management.

A four million dollar increase in research will improve the recreational catch database.

I know that the Marine Protected Areas strategy is of significant interest to all fisheries stakeholders. My colleague Chris Carter and I have said that marine reserves are only one way of safeguarding biodiversity and we need to be thinking about a range of options to balance the competing demands on our coastal resources.

In my speech to your conference last year I signalled work was beginning to review a number of regulations that are in place to manage recreational fisheries.

The purpose of this work was to provide recreational fishers with an opportunity to articulate the specific problems that you had with some of the regulations, and to explore how these difficulties might be resolved.

I am pleased to hear that there was robust and constructive discussion during the workshops associated with this review, and that a preliminary position has been reached on each of the proposals for change.

I expect to make final decisions on the proposed changes in time for them to be included in the October round of regulation changes. I see that a more detailed discussion of this review is scheduled for one of the conference sessions tomorrow morning.

This is a significant project, one of which I am fully supportive. Again I urge you to get involved and participate.

In recent years we have seen a significant Ministry focus on the illegal harvest and trade of species such as paua and rock lobster.

A number of significant prosecutions have highlighted the extent of the problem and the lengths to which offenders are prepared to go to succeed in their illegal business enterprises.

I am pleased to tell poachers and black-market fishing operations that they are the target of an \$11.6 million crackdown over the next four years contained in Budget 2005.

This includes \$2.9m of operational funding in the coming year to create a Special Tactics team for covert operations.

This gives us greater capacity to investigate more complex offending. This initiative will see the development of a major new multi-agency approach to target black market and poaching activities.

As recreational fishers, your most likely interface with the Ministry's compliance function is through Honorary Fisheries Officers. After a review of HFO effectiveness and safety a few years ago the Ministry restructured it's HFO service.

HFOs now commit to doing at least 100 hours a year and do their beat work in pairs. I can confirm to you that this restructuring has seen a massive reduction in the number of attacks on these officers, while simultaneously recording an increase in the number of hours delivered.

Tomorrow, Dr John Glaister, the Chief executive of the Ministry, will provide you with more detail on the Ministry's Statement of Intent.

John is well qualified to lead the Ministry. He has held various scientific and management positions in fisheries research and resource management in New South Wales, the Northern Territory and Queensland, Australia.

John has a great deal of respect for New Zealand's fisheries management techniques and is interested in facilitating a higher level of engagement with the recreational sector and other stakeholders in fisheries management decision-making.

As mentioned earlier, fisheries resources must be shared among those who derive legitimate value from them - including recreational, customary, and commercial fishers. The Statement of Intent acknowledges the importance of all these sectors and I urge you to take advantage of the insight he will share with you.

I would add, that those who use fisheries resources also have responsibilities. Responsibilities include using fisheries in a sustainable manner, protecting the aquatic environment, and taking only their share of the available yield.

One of my key responsibilities as Minister is around setting catch allowances. Last year I made important decisions around Kahawai. In doing that I took a deliberately cautious approach in setting the Total Allowable Catch because of uncertainty in information on the status of Kahawai stocks; doubled with a desire to maintain and hopefully improve the available stock.

At the time, I undertook to review Kahawai in 12 months time. I also undertook to commission further monitoring. Though that monitoring process is far from complete, some initial findings suggest that recreational Kahawai take is still low, particularly in the Hauraki Gulf.

The process for reconsideration of Kahawai allocation for 2005-06 has just begun. Yesterday I signed off the Initial Position Paper (IPP) for Kahawai. This is available now for consultation.

This position paper contains essentially two alternate options for consideration. Either the status quo, or a rebuild strategy.

These choices are underpinned by two quite different approaches to the management of shared fisheries.

The conservative no change option could be described as maintaining the status quo.

The other option is underpinned by a new policy idea - that species important to recreational fishers should be managed above, or even significantly above, what fisheries documents refer to as BMSY - the size of a fish stock that delivers the maximum sustainable yield.

According to the Fisheries Act, "utilisation" means conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing.

This new approach would effectively give greater recognition of recreational utilisation.

It would acknowledge that one size doesn't fit all. The optimum biomass of any fishery is likely to be different depending on the perspective of the fisher. For the recreational sector abundance of stock, a corresponding increased catch rate, or ability to catch larger fish, might be more important than extracting the maximum sustainable yield.

There is of course a trade off between yield and these other recreational utilisation qualities. If you want to catch fish more frequently, the size of the available stock will need to be increased above that which provides the maximum sustainable yield.

And therein lies the challenge and choice for you and me.

Let me add that under both Kahawai options, no additional recreational management controls are contemplated. There is no evidence before me, that the recreational sector is catching the allowance assigned to it. This issue will need to be monitored on an on-going basis.

I am sure you will be very interested in commenting on the papers just released and I expect an interesting consultation period.

As I said at the beginning of this address, a fundamental question is just how do we value recreational fishing.

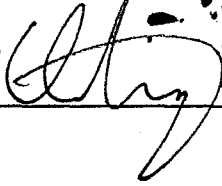
I hope that your conference is successful, and I again stress the Government's interest in working together with recreational fishers to realise the value and contribution that this sector has to offer our country and way of life.

Tēnā koutou, tēnā koutou, tēnā tātou kātao.

JH 5

This is the document marked **JH 5** mentioned and referred to in the affidavit of **JONATHAN CLIVE HOLDSWORTH** sworn at Auckland this 26th day of August 2005 before me:

Robert Pentney
Auckland
Campbell Robert Pentney
Solicitor
Auckland



Solicitor of the High Court of New Zealand

JH5

Review of Sustainability Measures and Other Management
Controls for Kahawai for the 2005-06 (1 October) Fishing Year

Initial Position Paper

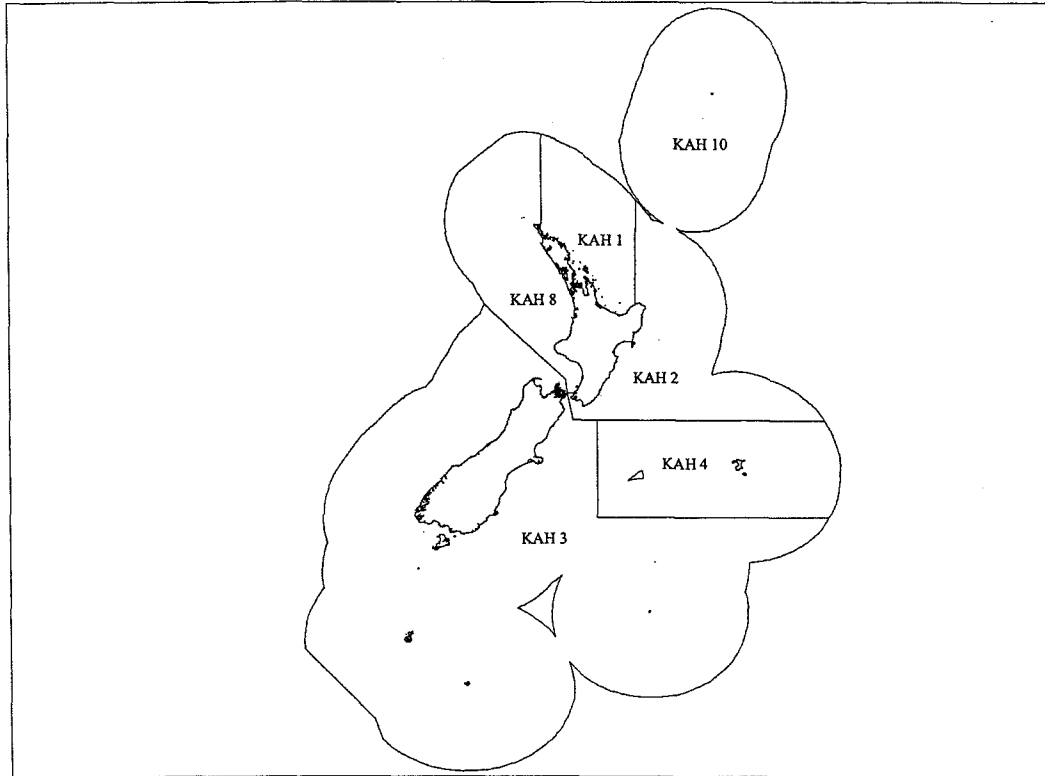
8 July 2005

INTRODUCTION

- 1 The purpose of this Initial Position Paper (IPP) is to seek your views on Ministry of Fisheries (MFish) proposals for a review of catch limits and allowances for kahawai.
- 2 The IPP has been developed for the purpose of consultation as required under the Fisheries Act 1996. MFish emphasises that the views and recommendations outlined in this paper are preliminary and provided as a basis for consultation with stakeholders.
- 3 The process that is undertaken to develop the initial position in IPPs involves consideration of recent research, analysis of commercial catch data, and any other relevant information. All IPPs have regard to the legal obligations required under the Fisheries Act.
- 4 A standard section outlining MFish's statutory obligations and policy guidelines for a proposal contained within any IPP is available from MFish should you wish to refer to these matters. A copy is also contained in the document 'Review of Sustainability Measures and Other Management Controls for the 2005-06 (1 October) Fishing Year – Initial Position Paper – 30 July 2005'
- 5 MFish requests that you provide comments on the proposals for kahawai no later than **5 August 2005**. Please send your comments to: Kristin Philbert, Ministry of Fisheries, PO Box 1020, Wellington, or email kristin.philbert@fish.govt.nz
- 6 Please note that all submissions are subject to the Official Information Act and can be released, if requested, under that Act. If you have specific reasons for wanting to have your submission withheld, please set out your reasons in the submission. MFish will consider those reasons when making any assessment for release of submissions if requested under the Official Information Act.

KAHAWAI (KAH 1-10)

Figure 1: Map showing the boundaries of the KAH (KAH 1-10) (*Arripis trutta* and *Arripis xylabion*) Quota Management Areas (QMAs).



Key Issues to be considered

- 7 The key issues to be considered for kahawai are:
- Kahawai were introduced into the Quota Management System (QMS) on 1 October 2004. The Minister of Fisheries (the Minister) set TACs, TACCs and allowances for kahawai stocks prior to that date (the 2004 decisions).
 - When the Minister set the TACs he stated that he was concerned about the state of kahawai stocks given that the combined estimates of recreational catch, customary catch, fishing-related mortality and reported commercial landings exceeded the best available yield estimates, based on the 1997 stock assessment. He noted that these 1997 yield estimates are outdated and uncertain. However, they remained as reference points of sustainable yield for kahawai.
 - The Minister was also aware of the widespread perception of recreational fishers that there is a marked decline in the amount and size of kahawai available. While recognising that anecdotal information was uncertain he

considered these perceptions to be important given the size of the recreational fishery.

- d) TACs totalling 7 612 tonnes were set. In the absence of reliable estimates of sustainable yield, the TACs were based on a 15% reduction to levels of use estimated at the time of introduction in 2004. Non-commercial allowances were set equivalent to 58%, and TACCs equivalent to 40%, of combined TACs (2% is allowed for incidental mortality).
- e) The Minister considered that the TACs should at least maintain and preferably provide for an increase in the kahawai biomass.
- f) The Minister indicated last year that he wanted to review the TACs for kahawai for the 2005–06 fishing year. The purpose of this review was to look at options for providing greater confidence that the TACs would provide for an increase in biomass.
- g) The current status of kahawai stocks remains uncertain and it is unknown whether stocks are currently above or below the biomass that can produce the maximum sustainable yield (B_{MSY}).
- h) There is no new stock assessment information available to assist in determining sustainability of current TACs. The research programme for kahawai is intended to provide information for a stock assessment of kahawai in 2007.
- i) A significant stakeholder in the fishery, the recreational sector, remains concerned that current measures are insufficient for ensuring that kahawai stocks increase in size. Recreational fishers consider that kahawai stocks have declined in abundance, availability and size of fish in the main stocks over the long term and in recent years. This view has not changed during the course of the current year. Some fishers do not believe the measures taken in 2004 were sufficient to appropriately manage risk to the stock of further decline and were inadequate for promoting any increase in the fishery.
- j) In contrast commercial fishers consider the 2004 decisions to be overly conservative and say that there is no evidence of declining kahawai stocks over recent years.
- k) Some research from the current research program was fast tracked in support of a review of catch limits and allowances for kahawai in 2005. As a result some new information is now available.
 - i) The size and age of the recreational fish sampled has remained relatively constant.
 - ii) Since 1991, recreational catch rates have fluctuated in the three regions sampled (Northland, Bay of Plenty and Hauraki Gulf), and there is some evidence of declining catch per trip in the Hauraki Gulf in recent years.
 - iii) A preliminary relative index of abundance for part of KAH 1 between 1977–78 and 2003–04 shows no agreed trend in biomass.
- l) For the most part this new information consists of preliminary findings or is limited in scope to certain geographic areas of the fishery only.

- m) A consideration for this fishery would be to adopt a specific management objective for managing the stock above B_{MSY} . MFish notes that both commercial and non-commercial submissions supported this concept in 2004. There is currently insufficient information to specify a target stock size or the catch levels necessary to achieve any particular target level.
- n) The Minister can take the following matters into account when reviewing the TAC:
- uncertainty in information on status of kahawai stocks;
 - anecdotal information on decline in abundance from some non-commercial fishers;
 - value of the fishery to recreational and commercial users;
 - desire to provide a greater level of certainty that the stock biomass will at least maintain its current level and preferably provide for an increase in biomass;
 - socio-economic information including the potential impacts and benefits to all sectors; and,
 - availability of new information to support a stock assessment of kahawai in 2007.
- o) There are two options proposed in this review. The first is to maintain the status quo TACs allowances and TACCs pending new scientific information to support a change. This option assumes that current catch limits will at least maintain and preferably provide for an increase in the kahawai biomass. The second option is to reduce TACs to take account of the uncertain information surrounding the status of kahawai stocks and achieve greater probability that these will increase pending a future reassessment of stock status. Adopting any option to reduce TACs would require that the decrease be based on a nominal percentage reduction.
- p) Should the Minister decide to reduce the TAC and allowances there is no proposal to apply additional management controls to further constrain recreational catch. Recreational fishers consider the catch will be within the current allowance without additional management controls. There is no new information to suggest that a revised recreational allowance would be exceeded with current management controls and at current levels of abundance.
- q) A research project is underway to estimate recreational catches of kahawai in KAH 1 in 2004–05 and a similar programme is proposed for KAH 8 in 2006–07. If new information comes to hand that suggests the need to constrain recreational catches to ensure that they remain within the allowances set for the fishery, management measures will be proposed at that time.

TAC options

- 8 There are two TAC options proposed in this review. The first is to maintain the status quo TACs allowances and TACCs pending new scientific information to support a

reassessment in 2007. This option assumes that current catch limits will at least maintain or provide for an increase in kahawai biomass.

9 The second option is to reduce TACs in all kahawai stocks by 10%. This option takes account of the continued uncertain information surrounding the status of kahawai stocks and will provide a greater level of certainty of maintaining or increasing biomass.

10 The following management options are proposed.

Table 1: Options for setting TACs, allowances and TACCs for kahawai.

Stock	TAC	Customary allowance	Recreational allowance	TACC	Fishing-related incidental mortality
KAH 1					
Option 1 (Status quo)	3 685	550	1 865	1 195	75
Option 2	3 315	495	1 680	1 075	65
KAH 2					
Option 1 (Status quo)	1 705	205	680	785	35
Option 2	1 530	185	610	705	30
KAH 3					
Option 1 (Status quo)	1 035	125	435	455	20
Option 2	935	115	390	410	20
KAH 4					
Option 1 (Status quo)	16	1	5	10	0
Option 2	14	1	4	9	0
KAH 8					
Option 1 (Status quo)	1 155	125	425	580	25
Option 2	1,040	115	385	520	20
KAH 10					
Option 1 (Status quo)	16	1	5	10	0
Option 2	14	1	4	9	0

Rationale for management proposal

11 Kahawai stocks are managed under s 13 of the Fisheries Act 1996. The purpose and principles require decision makers to provide for utilisation while ensuring sustainability. Section 13 provides that the biomass of the stock should be managed at or above a level that can produce MSY. If the biomass of a stock is below the level that supports the MSY, s 13 requires the Minister to rebuild the stock to at or above that level within a period appropriate to the stock (having regard to biological characteristics, socio-economic factors and interdependence of stocks). The Minister has a choice for stocks whose biomass is currently above the level that will produce MSY:

- to move the stock towards MSY at a way and rate considered appropriate for the stock; or
- maintain the biomass at a level above that which would support the MSY having regard to interdependence of stocks.

12 In considering the target biomass the Minister must have regard to biological factors, interdependence of stocks and socio-economic impacts.

- 13 The key benefits of management of stocks above the biomass that support the MSY are:
- the increased availability of fish; and
 - the increased size of fish.
- 14 Stocks managed above B_{MSY} are more abundant, providing greater opportunity for catches, in addition, there are generally a wider variety of sizes (age classes) of fish available in the population. Both of these factors increase non-commercial enjoyment from a fishery. Efficiency gains in commercial harvesting can also be expected. However, management of the stocks above B_{MSY} does not provide an opportunity to maximize yield from the fishery.
- 15 In determining the target level for the biomass of this stock, the Minister should, in line with his obligations under the purpose and principles, consider the relative benefit to stakeholders likely to be obtained under management at or above the biomass that will support the MSY. This analysis should include consideration of the trade off between the benefits associated with increased availability and size of fish and reduced yield. Although not clear cut, increased availability and size range of fish will likely benefit the recreational sector, whereas the increased yield if the biomass was managed at a level that could produce the MSY will likely benefit the commercial sector.
- 16 If one option is likely to provide greater benefit for one sector over another the Minister should consider whether such a benefit is reasonable.
- 17 MFish consider such a decision would likely be reasonable where:
- a) Stakeholders generally agree to management of the biomass above the level that can produce the MSY.
 - b) Where the available information suggests that greater utilisation benefit would result and could be achieved by managing according to the preference of the sector that values the resource the most.
- 18 In the case of kahawai submissions in 2004 indicated there was broad sector agreement to managing the biomass above a level that can produce MSY.
- 19 There is quantitative valuation available to show the relative value of the kahawai fishery to each sector. MFish has estimates of how much recreational fishers value kahawai based on non-market estimation techniques (contingent valuation to determine the willingness of a fisher to pay to catch a kahawai. Commercially caught kahawai is a relatively low value species. These data suggest that recreational fishers value the fishery more highly than commercial fishers.
- 20 Ideally the management objective would be developed as part of discussion with stakeholders on a management plan. However, at this stage there is no proposal to develop a management plan for the kahawai fishery.
- 21 There is no reliable estimate of sustainable yield for kahawai and no reliable information on the relationship between current biomass and that biomass that will

support the MSY. In the absence of reliable estimates of sustainable yield, TACs set for kahawai in 2004 were based on a proportion of estimates of the current use of the kahawai fishery.

- 22 The estimates of current use of the fishery immediately prior to introducing kahawai into the QMS (assessed at 8 767 tonnes) exceeded yield estimates based on the 1997 stock simulation model (refer to Appendix 1). Yield estimates of between 7 600 and 8 200 tonnes and a revised yield estimate submitted by Non-Commercial fishers of 6 900 tonnes were considered as reference points. While these estimates were considered to be outdated and uncertain they remain the only reference points of sustainable yield for kahawai. TACs totalling 7 612 tonnes were set that were 15% less than the level of use prior to introducing kahawai into the QMS.
-
- 23 The current research programme for kahawai is intended to provide information for a reassessment of kahawai stocks in 2007. The Minister asked MFish to fast-track research from the current research program in support of a review of catch limits and allowances in 2005. As a result of the fast tracking, some new information is now available and time series extended with recent data but for the most part this new information consists of preliminary findings or is limited in scope to certain parts of the fishery only (refer to Appendix 1).
- 24 MFish notes that in the main recreational fisheries in KAH 1, recreational claims of declining sizes of kahawai are not supported by catch sampling and age structure data from the recreational fishery, which has been closely monitored since 2000–01. The size and age of the fish sampled has remained relatively constant since 2000–01 with a broad age structure evident in the catches. These results are not consistent with a rapid decline in abundance. However, MFish notes that catch selectivity may influence these indicators.
- 25 The average number of kahawai caught per trip in KAH 1 is highest in the Bay of Plenty, and lowest in the Hauraki Gulf. Since 1991, catch rates have fluctuated in all three regions sampled, although there is some evidence of declining catch per trip in the Hauraki Gulf in recent years.
- 26 A preliminary relative index of abundance for kahawai has been developed for part of KAH 1 based on aerial sighting data. Trends vary depending on assumptions made about the model. There is no agreed interpretation of trends.
- 27 Given the Minister's desire to review the stock in 2005; two options are presented:
- a) retain the status quo; or
 - b) reduce the current TACs by 10%.
- 28 If the Minister placed greater weight on the following factors he may decide to retain the current TAC:
- the equivocal nature of information on sustainability concerns;
 - the socio-economic impacts of any reduction to existing catch;

- availability of new information in 2007 to support a revised stock assessment; and,
 - assumption that kahawai stocks are likely to be at or above B_{MSY} or moving in that direction;
- 29 Alternatively the Minister may place weight on the following factors and decide to reduce the TACs:
- uncertainty in information on status of the stock;
 - anecdotal information on decline in abundance from some non-commercial fishers;
 - value of the fishery to recreational and commercial users; and,
 - desire to provide a greater level of certainty that the stock biomass will at least maintain its current level and preferably provide for an increase in biomass.
- 30 There is currently insufficient information to determine where the stock is relative to the target stock size or the catch levels necessary to achieve any particular target level. Therefore any option for reducing TACs would be based on a nominal percentage. MFish proposes that TACs be reduced to 6 848 tonnes. This combined level of TACs is at the lower end of the range of reference points of yield considered during the 2004 review of kahawai catch limits and allowances.

TAC

KAH 1

- 31 MFish has proposed two options for setting the KAH 1 TAC as outlined in table 1.

Option 1 (Status quo)

- 32 Retaining the current TAC for KAH 1 of 3 685 tonnes.
- 33 This option assumes that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable, and the KAH 1 stock is likely to be at or above B_{MSY} or be moving in that direction. This position is uncertain, and is not supported by anecdotal information from recreational fishers. Anecdote from the commercial fishery supports this option.

Option 2 (Reduced)

- 34 A TAC of 3 315 tonnes is proposed. This option is based on a 10% reduction of the TAC to provide for greater certainty in achieving a target stock level at or above B_{MSY} . There is no information to suggest if, or how rapidly, the stock will increase under this option. However, MFish considers that a TAC set at a level lower than the current TAC will provide greater opportunity for the stock to increase in abundance despite the uncertainty in information.

- 35 There are social and economic considerations associated with adopting this option. There will be a loss in value to commercial fisheries from reduced landings. These are discussed in more detail in the socio-economic section.

KAH 2

- 36 MFish has proposed two options for setting the KAH 2 TAC as outlined in table 1.

Option 1 (Status quo)

- 37 Retaining the current TAC for KAH 2 of 1 705 tonnes.
- 38 This option assumes that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable, and the KAH 2 stock is likely to be at or above B_{MSY} or be moving in that direction. This position is uncertain, and is not supported by anecdotal information from recreational fishers. Anecdote from the commercial fishery supports this option.

Option 2 (Reduced)

- 39 A TAC of 1 530 tonnes is proposed. This option is based on a 10% reduction of the TAC to provide a greater certainty of achieving a target stock level at or above B_{MSY} . There is no information to suggest if, or how rapidly, the stock will increase under this option. However, MFish considers that a TAC set at a level lower than the current TAC will provide greater opportunity for the stock to increase in abundance despite the uncertainty in information.
- 40 There are social and economic considerations associated with adopting this option. There will be a loss in value to commercial fisheries from reduced landings. These are discussed in more detail in the socio-economic section.

KAH 3

- 41 MFish has proposed two options for setting the KAH 3 TAC as outlined in table 1.

Option 1 (Status quo)

- 42 Retaining the current TAC for KAH 3 of 1 035 tonnes.
- 43 This option assumes that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable, and the KAH 3 stock is likely to be at or above B_{MSY} or be moving in that direction. This position is uncertain, and is not supported by anecdotal information from recreational fishers. Anecdote from the commercial fishery supports this option.

Option 2 (Reduced)

- 44 A TAC of 935 tonnes is proposed. This option is based on a 10% reduction of the TAC to provide a greater certainty of achieving a target stock level at or above B_{MSY} . There is no information to suggest if, or how rapidly, the stock will increase under this option. However, MFish considers that a TAC set at a level lower than the current

TAC will provide greater opportunity for the stock to increase in abundance despite the uncertainty in information.

- 45 There are social and economic considerations associated with this option. There will be a loss in value to commercial fisheries from reduced landings. These are discussed in more detail in the socio-economic section.

KAH 4 (Status quo)

- 46 MFish has proposed two options for setting the KAH 4 TAC as outlined in table 1.

Option 1 (Status quo)

- 47 Retaining the current TAC for KAH 4 of 16 tonnes.
- 48 This option assumes that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable, and the KAH 4 stock is likely to be at or above B_{MSY} or be moving in that direction. This position is uncertain, and is not supported by anecdotal information from recreational fishers. Anecdote from the commercial fishery supports this option.

Option 2 (Reduced)

- 49 A TAC of 14 tonnes is proposed. This option is based on a 10% reduction of the TAC to provide a greater certainty of achieving a target stock level at or above B_{MSY} . There is no information to suggest if, or how rapidly, the stock will increase under this option. However, MFish considers that a TAC set at a level lower than the current TAC will provide greater opportunity for the stock to increase in abundance despite the uncertainty in information.
- 50 There are probably only minor social and economic considerations associated with this option. These are discussed in more detail in the socio-economic section.

KAH 8

- 51 MFish has proposed two options for setting the KAH 8 TAC as outlined in table 1.

Option 1 (Status quo)

- 52 Retaining the current TAC for KAH 8 of 1 155 tonnes
- 53 This option assumes that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable, and the KAH 1 stock is likely to be at or above B_{MSY} or be moving in that direction. This position is uncertain, and is not supported by anecdotal information from recreational fishers. Anecdote from the commercial fishery supports this option.

Option 2 (Reduced)

- 54 A TAC of 1 040 tonnes is proposed. This option is based on a 10% reduction of the status quo recreational allowance and TACC to provide a greater certainty of achieving a target stock level at or above B_{MSY} . There is no information to suggest if,

or how rapidly, the stock will increase under this option. However, MFish considers that a TAC set at a level lower than the current TAC will provide greater opportunity for the stock to increase in abundance despite the uncertainty in information.

- 55 There are social and economic considerations associated with adopting this option. There will be a loss in value to commercial fisheries from reduced landings. MFish notes that ACE will primarily be required to cover the bycatch of fishing for other species in KAH 8, if option 2 is adopted. This is discussed in more detail in the socio-economic section.

KAH 10 (Status quo)

- 56 MFish has proposed two options for setting the KAH 10 TAC as outlined in table 1.
-

Option 1 (Status quo)

- 57 Retaining the current TAC for KAH 10 of 16 tonnes.
- 58 This option assumes that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable, and the KAH 10 stock is likely to be at or above B_{MSY} or be moving in that direction.

Option 2 (Reduced)

- 59 A TAC of 14 tonnes is proposed. This option is based on a 10% reduction of the TAC to provide a greater certainty of achieving a target stock level at or above B_{MSY} . There is no information to suggest if, or how rapidly, the stock will increase under this option. However, MFish considers that a TAC set at a level lower than the current TAC will provide greater opportunity for the stock to increase in abundance despite the uncertainty in information.
- 60 There are probably only minor social and economic considerations associated with this option. These are discussed in more detail in the socio-economic section.

Allowances and TACC

- 61 The TAC is the primary sustainability measure for a fish stock and is intended to include all sources of fishing and fishing-related mortality. When setting any TAC, a TACC must be set, and allowances determined for the Māori customary and recreational fishing interests and for any incidental fishing related incidental mortality.
- 62 The 1996 Act stipulates a process by which the TAC is to be allocated. However, no explicit statutory mechanism provides guidance as to the apportionment of the TAC between sector groups either in terms of a quantitative measure or prioritisation of allocation. The nature of the Ministers discretion is broad. Subject to the constraints of the scope of the Act, the Minister is able to take into account such factors he/she considers to be relevant to his/her decision and determine the weight he/she considers to be appropriate to be placed on such factors. The Minister needs to make an assessment as to the competing needs of the sector groups for a limited resource and

have regard to the relevant social, economic and cultural implications when making his or her decision.

63 MFish has set out a list of factors that it considers relevant to any allocation decision in the Statutory Considerations and Policy Guidelines section of the Initial Position Paper on the Review of Sustainability Measures and Other Management Controls for the 2005–06 Fishing Year. In addition, MFish has been guided by judicial decisions that consider the issue of allocation of the TAC. In particular, case law has identified that:

- a) all stakeholders' demands for a stock need to be considered;
- b) the needs of any particular sector do not need to be fully provided for when specifying an allowance;
- c) the existing ratio between commercial and recreational interests can be varied;
- d) where commercial landings are reduced for sustainability reasons, reasonable steps should be taken to avoid the reduction being made less effective because of increased fishing by non-commercial stakeholders; and
- e) it is not unreasonable for commercial and recreational fishers to share some of the "pain" from a reduction in the TAC.

64 To help develop advice on kingfish – also a shared fishery – MFish categorised the broad range of issues the Minister could consider into two basic allocations frameworks. Both approaches are consistent with the Act, and are not necessarily mutually exclusive. Detailed information on each approach is contained in the statutory interpretation section of the Initial Position Paper. In summary the broad approaches are as follows:

- a) A claims-based approach, where allowances are set on the basis of a consideration of the legitimacy of claims to the resource. Generally these claims are based on some form of present or historical association with the resource, giving rise to expectations on the part of fishers (or classes of fishers) with respect to on-going future involvement.
- b) A utility-based approach, where allowances are based on the utility (or level of well being) that would flow from the allowance made to a particular fishing sector. This approach tends to give a higher priority in allowance setting to those sectors that value the resource most. As such it tends to have a focus on future, rather than past, uses and values that sectors have placed on a species or stock.

65 The Minister may adopt elements of both approaches in reaching a decision on allowances. Two options are available for kahawai:

- A proportional approach where allowances are reduced proportionally based on existing shares of the TAC; or
- A non-proportional approach where preference is given in the allowance to one sector.

66 Kahawai is a shared resource. Non-commercial removals contribute approximately 58% percent of the existing TAC. MFish generally supports a proportional approach to allocation of shared fisheries on the basis that all stakeholders should contribute to

the increasing the abundance of the resource. This position assumes that all sectors are to a lesser or greater degree responsible for the present state of the fishery. Further, it assumes that the level of catch reduction achieved from each contributing sector is of some consequence to the overall reduction required. However, the Act allows the Minister broad discretion. A preference may be provided to one sector over another when making a determination on the allowances that should be set before a decision on the TACC.

- 67 There is an on-going obligation under the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 to give recognition to the use and management practices of Maori in the exercise of non-commercial fishing rights. In view of the sustainability concerns for kahawai MFish proposes to reduce customary allowances in this case.
- 68 Option 2 proposes a 10% reduction in existing use of kahawai stocks. MFish proposes TACCs and allowances that are derived from a proportion of the existing level of TACCs and allowances (proportional approach).

Maori customary allowances

- 69 Proposals for Maori customary allowances in tonnes for each QMA are set out in Table 1. Kahawai is known to be a species of customary importance to Maori. MFish notes that the implementation of customary regulations will improve the ability to monitor the customary harvest in relation to the allowances set for the fishery.

Option 1 (Status quo)

- 70 To retain current allowances for customary Maori fishing for all kahawai stocks. .

Option 2 (Reduced)

- 71 To reduce the allowances for Maori customary fishing for all fishstocks by 10%. Based on current anecdote from the fishery MFish assesses that there will be limited socio-economic impacts associated with adopting this option.

Recreational fishing allowances

- 72 Proposals for recreational allowances in tonnes for each QMA are set out in Table 1.

Option 1 (Status quo)

- 73 To retain current allowances for recreational fishing for all kahawai stocks.

Option 2 (Reduced)

- 74 To reduce the allowances for recreational fishing for all fishstocks by 10%. Based on current anecdote from the fishery MFish assesses that there will be limited socio-economic impacts associated with adopting this option.

Management of recreational catch

- 75 Potential management measures to constrain recreational kahawai catches include the imposition of a minimum legal size (effective for some species such as kingfish) or the setting of a separate and reduced daily bag limit.
- 76 At present there is no minimum legal size limit for kahawai taken recreationally and 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 daily limit of 15 applies). Within the mixed bag limit, if kahawai is the only species taken, then up to 20 may be taken per person per day.
- 77 The current recreational allowances are based on levels of utilisation estimated by telephone diary harvest surveys in 1999/00. The need for additional management measures (reducing bag limits) was considered as part of the 2004 decisions. However, recreational fishers said that they were unable to catch kahawai up to the allowances set (even though these were reduced by 15%) because of declining availability of kahawai to recreational fishers. The Minister accepted this view at that time.
- 78 The telephone diary survey technique and its associated estimates have been subject to intensive recent review. The results of all survey are now subject to significant qualifications (refer section of Appendix I). Most importantly 1999–2000 estimates are thought to be considerable over-estimates for some stocks. At the time initial allowances for recreational fishing were set for kahawai MFish had no information to suggest that this was the case for this species.
- 79 Although highly localised and temporally limited, recent information from Hauraki Gulf surveys of recreational catch supports the assertion that recreational harvest in this area over the summer of 2003–04 was low. It is unknown whether changes in abundance of the stock, availability due to environmentally induced effects, previous catch estimates being too high, or other seasonal effects are responsible for this recent low catch of kahawai in this area.
- 80 In the context of this review it is unknown if there is a need for any additional management measures to constrain recreational catch at this time, even at the reduced level of recreational allowances proposed for option 2. Current anecdote suggests that recreational fishers are unable to catch to the level of the current allowances set for the fishery and even at reduced allowances this situation would prevail. Recent research information shows that catch and catch per unit of effort for kahawai was low for the Hauraki Gulf during the 2003–04 summer. This trend is not apparent in other areas of the KAH 1 fishery and no recent information is available for other stocks.
- 81 MFish is concerned to ensure that management measures are in place for protecting the integrity of TACs set for QMS stocks but, in this case, MFish proposes to review the need for additional management measures for constraining the recreational catch of kahawai to allowances as soon as new information on the size of the recreational catch at the level of fishstocks becomes available.
- 82 MFish has now adopted alternative methods from diary harvest surveys for better estimating recreational catch. A research project is underway to estimate recreational

catches of kahawai in KAH 1 in 2004–05 and a similar programme is proposed for KAH 8 in 2006–07. Recreational research undertaken during the 2004–05 year for the whole of the KAH 1 fishery will form the initial basis of this consideration. Extending the coverage of this survey to other fishstocks is a priority to ensure that the total kahawai recreational catch is quantified as soon as is practical.

TACCs

83 Proposed TACCs in tonnes for each QMA are set out in Table 1.

Option 1 (Status quo)

84 To retain current TACCs for all kahawai stocks.

Option 2 (Reduced)

85 To reduce the TACCs for all fishstocks by 10%. MFish assesses that there will be socio-economic impacts associated with adopting this option. These impacts are considered in the following section.

Management of commercial landings

86 No change is proposed to other management controls on commercial fishing including deemed values for kahawai.

Loss of economic return

87 There are a number of possible economic effects from setting TACCs at the levels proposed under option 2. Among those that are assessable, lost opportunity costs (associated with further limitations on commercial catch) need to be weighed against the uncertainty in current stock status, the value of kahawai as a shared fishery and the importance of this species in an ecological context.

88 MFish has evaluated the potential economic impact of adopting option 2 on Industry in more detail. MFish notes that these impacts will add to those associated with adjusting to the current management measures for kahawai.

Points of comparison

89 MFish has used points of comparison to compare the socio-economic impacts of adopting option 2 as follows:

- a) Current TACCs; and
- b) Average bycatch.

90 The current TACCs form the basis of the status quo fishery. Accordingly it is a useful point of comparison to the reductions in TACC proposed.

91 MFish notes that adopting option 2 would not reduce any TACC below the average landings of bycatch in any fishstock.

- 92 A further point of comparison for any potential economic impact is the constraint a shortage of ACE for bycatch species might impose on target fisheries. Kahawai bycatch at moderate levels is associated with target fishing for jack mackerels, trevally, snapper and grey mullet. As most of the bycatch of kahawai is in the purse seine fishery for jack mackerels and the trawl fisheries for trevally and snapper incidental bycatches of kahawai can probably not be actively managed by fishers.
- 93 Levels of reported bycatch between 1999-00 and 2004-05 are less than that reported between 1995-96 and 1998-99 and are more stable. The more recent values are based on fishing methods and fishing patterns in use in the current fishery. Accordingly average bycatch levels for the five most recent fishing years reported have been used for this point of comparison.

Table 2: Points of comparison (tonnes of kahawai) for evaluating annual loss of economic return

QMA	1	2	3	4	8	10	Total
Current TACCs	1 195	785	455	10	580	10	3 035
Average bycatch (2001-04)	350	180	100	<1	470	<1	1 100

Estimates of loss of economic return

- 94 Assessing loss of economic return for kahawai TACC options is problematic. MFish has therefore provided two alternative reference points to consider with respect to the choice of TACC options. MFish has used port prices and recent ACE prices to assess opportunity costs of TACC options with respect to these reference points. Accordingly, MFish has estimated the potential loss of economic return with respect to the points of comparison above for each of the following factors:
- a) loss in earnings from kahawai (based on port price); and
 - b) loss in ACE value.
- 95 Commercial impacts can be measured as direct opportunity costs. A tonne of kahawai has a value and any reduction in tonnage for the commercial sector as a result of a lower TACC can be measured as an opportunity cost. MFish considers that impacts can best be measured by asset value and by forgone annual earnings as provided by the port price and ACE price of kahawai (MFish notes that port prices will overestimate annual earnings as these include handling costs).
- 96 There may be a change in quota value, however the degree to which it will change is an empirical question and difficult to estimate without a full economic assessment of the fishery. Since the quota value is the opportunity cost not to harvest, in the long term the quota value may increase as the stock abundance improves even at a reduced TACC setting.
- 97 MFish has evaluated loss of economic return of adopting option 2 for each fishstock against the points of comparison.
- 98 Taking the difference between option 2 TACCs and the point of comparison and multiplying this difference by the port prices used in the setting of the 2004–05 levy order (\$0.8805 for KAH1 and \$0.8125 for the other stocks) estimates the forgone annual earnings associated with landing fish and adopting option 2.

- 99 Taking the difference between the option 2 TACCs and the point of comparison and multiplying by the 2004–05 ACE value per tonne for all stocks estimates the forgone annual earnings (quota owners only) associated with leasing ACE and adopting option 2. The ACE values range between 0.13 \$/kg and 0.37 \$/kg depending on fishstock.
- 100 For associated fisheries, economic impacts can occur when ACE is not available to cover the inevitable bycatch associated with other target fisheries. Impacts include the payment of deemed values for any kahawai taken above ACE. The potential for deemed value costs is influenced by the circumstances of individual fishers with respect to their ACE holdings of kahawai, as well as a fisher’s ability to avoid kahawai as a bycatch.
- 101 An alternative to the payment of deemed value when there is insufficient ACE to cover bycatch is that fishers could stop fishing for their target species. MFish is not aware of any current situation where the landing of target species is constrained by the level of bycatch TACCs. Typically when landings are taken in excess of the bycatch TACC deemed values are paid. Accordingly, MFish does not consider there will be any potential costs of foregone fishing for associated species due to kahawai bycatch limitations.
- 102 The assessment of the potential economic loss associated with TACC options is summarised in Table 3.

Table 3: Assessment of potential loss of economic return for TACC options with forgone return in brackets (in thousands of \$)

Potential Impact	Point of comparison	KAH 1	KAH 2	KAH 3	KAH 4	KAH 8	KAH 10
Current TAC							
Port price	Option 2	(106)	(65)	(37)	(<1)	(49)	(<1)
Loss in leased ACE	Option 2	(36)	(16)	(7)	(-0)	(22)	(-0)

- 103 Adopting option 2 would reduce TACCs by about 305 tonnes in comparison to the status quo. The reduced TACC means that less ACE will be available, and therefore the price of ACE may increase. The long-term value of the quota asset due to the effect of any change in TACC is unknown.

Allowance for other sources of fishing-related mortality

- 104 There is no information on the current level of illegal catch. The Report from the Fishery Assessment Plenary¹ states that there is no information on other sources of mortality apart from juvenile kahawai, which may suffer from habitat degradation in estuarine areas. Nevertheless, MFish notes that incidental fishing related mortality is likely from all sectors in the fishery. MFish proposes retaining an arbitrary 2% of the

¹ Report from the Fishery Assessment Plenary, May 2005: stock assessments and yield estimates Part 1: Albacore to Moonfish Compiled by K.J. Sullivan, P.M. Mace, N.W. McL. Smith, M.H. Griffiths, P.R. Todd, M.E. Livingstone, S.J. Harley, J.M. Key & A.M. Connell. May 2005.

TAC as a basis for providing an allowance for all other sources of fishing relating mortality.

Other Management Measures

Voluntary and regulatory method based fishing restrictions

- 105 The recreational sector believes that there is conflict with commercial fishing for kahawai, particularly with purse seiners and set netters. These concerns are currently mitigated by voluntary agreements² and by an outcome of the set net review³.
- 106 There is currently no provision for considering spatial allocation to manage utilisation of a fishery within the process of setting sustainability measures and therefore continued voluntary arrangement between sectors to retain these measures for kahawai might be necessary with kahawai in the QMS.
- 107 Area restrictions could form part of a determination to resolve a dispute between fisheries sectors. Part VII of the Act provides for the determination of such disputes. It applies to disputes over the effects of fishing by one party on the fishing of another. It does not apply to disputes about ensuring sustainability, or about the effects of fishing authorised under Part IX (Taiapure- Local Fisheries and Customary Fishing). The Minister has determined an approved procedure for resolving disputes.

Future Management

Recreational harvest levels

- 108 More research, and agreement on the value of existing information, is required for kahawai recreational catch estimates. Effective management of the stock is being compromised by this lack of information. MFish has contracted further recreational research using an alternative aerial and boat ramp survey technique for key recreational species. It is currently being applied in KAH 1 and if successful will be considered for application in other areas of the fishery.

Future stock assessment

- 109 A stock assessment of kahawai stocks is planned for 2007 and is due to be considered by the Pelagic Stock Assessment Working Group in that year. Notwithstanding which option is chosen during the current review it is possible that sustainability measures for kahawai will again be reviewed during 2007 or 2008. This latter review is likely to have improved information available on stock status and an appropriate target level for kahawai stocks.

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

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

Statutory Considerations

110 In forming the management proposal the following statutory considerations have been taken into account.

- a) **Section 5** requires that the Act shall be interpreted and all persons exercising or performing functions, duties, or powers under the Act shall act in a manner consistent with New Zealand's international obligations relating to fishing, and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5) are adequately addressed in the management options for kahawai.
- b) **Section 8** sets out the purpose of the Fisheries Act 1996 as being "*to provide for the utilisation of fisheries resources while ensuring sustainability*". MFish has outlined two options to ensure that management of kahawai is consistent with the purpose of the Act. The options are based on different levels of likelihood of increasing the abundance of the stock. The TACCs, and allowances for recreational and customary fishers are intended to provide for use of the kahawai fishery.
- c) **Section 9** requires that decisions take into account the environmental principles as set out in:
 - i) **Section 9(a)** requires that associated or dependent species should be maintained above a level that ensures their long-term viability. Kahawai fishing is not known to pose a risk to the long-term viability of any associated or dependent species. However, there are recreational concerns about the effect any reduction in kahawai schools might be having on interdependent stocks of predators such as marlin and tuna. Unfortunately, the factors influencing the distribution of highly migratory stocks of these species are complex and not well understood. They do suggest the need for caution in setting sustainability measures for the stock.
 - ii) **Section 9(b)** requires that biological diversity of the aquatic environment be maintained. The major commercial method, purse seining is not known to pose a risk to the maintenance of biodiversity of the aquatic environment.
 - iii) **Section 9(c)** requires that habitat of particular significance to fisheries management should be protected. Habitats of particular significance for fisheries management have been identified for KAH 3 and these have been taken into account when preparing this advice. No other habitats of particular significance for kahawai management have been identified.
- d) **Section 10** requires that all persons exercising or performing functions, duties, or powers under the Act in relation to utilisation or sustainability of fisheries resources, shall take into account the following information principles:
 - i) Decisions should be based on the best available information;
 - ii) Decision makers should consider any uncertainty in the information available in any case;

- iii) Decision makers should be cautious when information is uncertain, unreliable, or inadequate;
- iv) The absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

The information used to develop proposals for kahawai refers to an assessment of the stock last updated in 1997. There is uncertainty about this assessment (and it is now eight years out of date) however, uncertainty and the absence of information is no reason for failing to provide for utilisation at levels considered to be sustainable, however MFish notes that caution is required in this instance.

The level of non-commercial catch within New Zealand fisheries waters is uncertain with regard to setting allowances for recreational, customary Maori use and other sources of fishing-related mortality. MFish notes, however, that uncertainty in information is not a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act.

- e) *s 11(1)(a)* requires taking into account effects of fishing on the stock and aquatic environment. These have been taken account for current managements measures (option 1) and are likely to be reduced under option 2.
- f) *Section 11(1)(b)* requires that the Minister takes into account any existing controls that apply to the stock or area. For kahawai stocks, the existing combined TACs of 7,612 tonnes is the key control under consideration for change. There are regulated set net closures and voluntary agreements relating to purse seining that have applied for some time. The later are voluntary agreements and MFish does not consider that they materially affect the Minister's consideration of the proposed TACC and establishment of a TAC. No changes to existing controls beyond the TAC, allowances, and TACC are being proposed.
- g) Natural variability is a relevant factor to consider when setting or altering a sustainability measure (*s 11(1)(c)*). Kahawai populations do not have high levels of natural variability although there may be variable recruitment from year to year. MFish does not consider that the variability of kahawai populations are such that the approach to adjusting a TAC should be different from that proposed.
- h) *Section 11(2A)(b)* requires that the Minister shall take into account any relevant fisheries plan approved under s 11A before setting or varying any sustainability measure. No fisheries plan for kahawai has been approved and MFish is not aware of any fishery plan under development for kahawai.
- i) *Section 11(2A)(a and c)* requires the Minister to take into account any relevant conservation services or fisheries services or decisions not to require such services. No suggestion is made to alter any decision about whether such services are required. A medium term research plan for kahawai stocks identifies the expected research activities over the short term, and significant additional research is planned for the 2005-06 and 2006-07 fishing years leading up to the provision of a stock assessment for kahawai in 2007.

- j) **Section 11(2)(a) and (b)** require that the Minister shall have regard to any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, and any management strategy or management plan under the Conservation Act 1987 that applies to the coastal marine area and which the Minister considers relevant, before setting or varying any sustainability measure. There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for any kahawai stock.
- k) As required under **s 11(2)(c)**, MFish has considered how the proposals for KAH 1 meet the requirements of sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000. This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. MFish considers that, under both options, the management measures for KAH 1 will meet the purpose of the Hauraki Gulf Marine Park Act.
- l) **Section 13(2)** requires that a TAC be set that maintains a stock at or above a level that can produce the maximum sustainable yield (denoted as B_{MSY}), or to be altered in a way and at a rate that will result in the stock moving towards or above a level that can produce the MSY, having regard to the interdependence of stocks. The status of kahawai stocks with respect to a target biomass is unknown. The Minister has indicated a desire to increase abundance above current levels.
- m) The proposed TACs are also based on **section 13(3)**, which requires that the Minister shall have regard to such social, cultural, and economic factors as he considers relevant when he is considering the way in which and rate at which a stock is moved towards or above the B_{MSY} level under s 13(2)(b) or (c). The economic consequences from decreasing the TAC and TACC are detrimental to the commercial sector, and these costs are assessed in this paper. All sectors are considered to benefit from a more rapid increase in size of kahawai stocks.
- n) **Sections 21(1)(a and b) and (4)(i and ii) and (5)** require that in setting or varying the TACC, the Minister shall have regard to the TAC for the stock and shall allow for Maori customary non-commercial fishing interests, recreational fishing interests, and all other mortality to the stock caused by fishing. When allowing for Maori customary non-commercial fishing interests, the Minister must take into account any *mātaitai* reserve in the relevant quota management area and any closure or method restriction in the area made under s 186A. Further, when allowing for recreational interests, the Minister shall take into account any regulations that prohibit or restrict fishing in any area and were made under s 311.

The nature of the fishery and the interests of each fishing sector have been considered in proposing the TACC, allowances for recreational and customary interests, and for other sources of fishing-related mortality. No area has been closed or fishing method restricted for customary fishing purposes that is likely to affect fishing for this pelagic fishery. Areas have been closed for customary fishing purposes in KAH 1 (eg Eastern Beach in the Hauraki Gulf) and the KAH 8 stock (eg at Tinopai in the Kaipara Harbour), but the closures

do not affect kahawai fisheries today. No restrictions have been placed on recreational fishing in any area under s 311 of the Fisheries Act. The regulatory restrictions on set netting, and the voluntary restrictions that apply to commercial fishing for protecting recreational interests, have been considered when making recommendations.

Preliminary Recommendations

111 MFish recommends that the Minister:

EITHER

- a) **Agrees** to retaining status quo TACs, allowances and TACCs including the decision to make no change to recreational bag limits pending the availability of further information on the recreational take;

OR

- b) **Agrees** to set a TAC of 3 315 tonnes for KAH 1 and within that TAC set:
 - i) A customary allowance of 495 tonnes;
 - ii) A recreational allowance of 1 680 tonnes;
 - iii) An allowance for other fishing-related mortality of 65 tonnes; and
 - iv) A TACC of 1 075 tonnes.
- c) **Agrees** to set a TAC of 1 530 tonnes for KAH 2 and within that TAC set:
 - i) A customary allowance of 185 tonnes;
 - ii) A recreational allowance of 610 tonnes;
 - iii) An allowance for other fishing-related mortality of 30 tonnes; and
 - iv) A TACC of 705 tonnes.
- d) **Agrees** to set a TAC of 935 tonnes for KAH 3 and within that TAC set:
 - i) A customary allowance of 115 tonne;
 - ii) A recreational allowance of 390 tonne;
 - iii) An allowance for other fishing-related mortality of 20 tonne; and
 - iv) A TACC of 410 tonnes.
- e) **Agrees** to set a TAC of 14 tonnes for KAH 4 and within that TAC set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 4 tonnes;
 - iii) No allowance for other fishing-related mortality; and
 - iv) A TACC of 9 tonnes.
- f) **Agrees** to set a TAC of 1,040 tonnes for KAH 8 and within that TAC set:
 - i) A customary allowance of 115 tonnes;
 - ii) A recreational allowance of 385 tonnes;
 - iii) An allowance for other fishing-related mortality of 20 tonnes; and

- iv) A TACC of 520 tonnes.
 - g) **Agrees** to set a TAC of 14 tonnes for KAH 10 and within that TAC set:
 - i) A customary allowance of 1 tonne;
 - ii) A recreational allowance of 4 tonnes;
 - iii) No allowance for other fishing-related mortality; and
 - iv) A TACC of 9 tonnes.
 - h) **Agrees** that monitoring recreational catch of kahawai within allowances set for the fishery is a priority.
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APPENDIX ONE

Biological information

Distribution

- 112 Kahawai are a schooling pelagic species belonging to the family Arripidae. Kahawai are found around the North Island, the South Island, the Kermadec and Chatham Islands. They occur mainly in coastal seas, harbours and estuaries and will enter the saltwater sections of rivers. A second species, *A. xylabion*, was described during 1993. It is known to occur in the EEZ at the Kermadecs and seasonally around Northland.
- 113 Kahawai live in a variety of habitats, ranging from tidal intrusions into rivers, estuaries and coastal embayments, through to open waters many miles offshore. Juvenile fish (0+ year class) can be found in shallow water over eelgrass meadows and in estuaries. Older year classes of kahawai are often found in surface schools of similarly sized fish often in association with schools of jack mackerels, blue mackerel and trevally.
- 114 Kahawai are presently considered to form one New Zealand wide stock but defined as separate units for the purpose of fisheries management: KAH 1 (FMA 1); KAH 2 (FMA 2); KAH 3 (FMAs 3–8); KAH 9 (FMA 9) and KAH 10 (FMA 10).

Age, growth, mortality

- 115 Biological information suggests no significant differences in the growth rate, and length weight relationship between the sexes. The growth rate is moderate and the maximum-recorded age of kahawai is 26 years. Based on the maximum age, natural mortality (M) is estimated to equal 0.18. A range of 0.15–0.25 is assumed to reflect the lack of precision in the estimate.

Reproduction

- 116 There is no difference in the onset of maturity between the sexes. Kahawai mature at about 40 cm fork length, at which length they are aged between three to five years, and spawning occurs on the seabed (60–100 m deep) in open water. Fecundity estimates have ranged from 210 000 for a 415 mm female to 440 000 for a 507 mm female.

Natural variability

- 117 The natural variability of kahawai stocks is not well described. The species is moderately long lived and accordingly any variability in recruitment is likely to be less pronounced than for a short-lived species.

Position in food chain

- 118 Adult kahawai feed mainly on small pelagic fishes such as anchovy, pilchard and yellow-eyed mullet, but also on pelagic crustaceans, especially krill. Benthic species

such as crabs and polychaetes are also eaten on occasion, especially during the summer months. Juvenile kahawai feed primarily on copepods. Kahawai are known to shift between pelagic and benthic habitats, which is likely to relate in part to feeding behaviour. Larger fish such as kingfish predate kahawai.

Catch information

Commercial catch

Catch and landing by FMA/QMA

119 Reported commercial landing summaries of kahawai for each FMA/QMA for the fishing years 1983–84 to 2003–04 are given in Table 5.

Table 5. Reported commercial landings (tonnes) of kahawai by FMA/QMA from 1983-84 to 2003-04.

Fishing Year	FMA*/QMA#						Total
	1	2	3	4	8	10	
1983–84*	1 941	919	813	0	547	0	4 266
1984–85*	1 517	697	1 669	0	299	0	4 623
1985–86*	1 597	280	1 589	0	329	0	4 416
1986–87*	1 890	212	3 969	0	253	0	7 525
1987–88*	4 292	1 655	2 947	0	135	0	9 610
1988–89*	2 170	779	4 301	0	179	0	7 431
1989–90*	2 049	534	5 711	0	156	0	8 466
1990–91*	1 617	872	2 950	0	242	0	5 687
1991–92*	2 190	807	1 900	0	199	<1	5 104
1992–93*	2 738	1 132	1 930	0	832	2	6 639
1993–94*	2 069	1 136	1 861	0	98	0	5 164
1994–95*	1 918	1 079	1 290	0	168	0	4 479
1995–96*	1 904	760	1 548	0	237	7	4 502
1996–97*	2 214	808	938	0	194	1	4 158
1998–99#	1 566	729	1 078	0	845	<1	4 468
1999–00#	1 602	928	484	<1	725	0	3 921
2000–01#	1 592	875	403	0	552	0	3 610
2001–02#	1 287	832	152	<1	475	0	2 874
2002–03#	809	1 159	443	0	505	0	2 916
2003–04#	1 579	831	107	0	182	0	2 699

* CLD data reported on basis of Fisheries Management Area (FMA).

CLD data prorated to kahawai Quota Management Area (QMA) on basis of statistical area reported.

120 Between 1970–1975 the annual average commercial landings of kahawai was about 500 tonnes, much for use as bait. However, fishing practices evolved to utilise this relatively low value commercial species. Since the mid 1970s purse seine vessels have fished for skipjack tuna around the North Island over summer. For approximately five months of the year (December to May) the fleet, based in Tauranga, targets skipjack tuna (*Katsuwonus pelamis*). When skipjack is no longer available during the winter and spring months the fleet fish for a mix of species including kahawai, jack mackerels (*Trachurus* spp.), and blue mackerel (*Scomber australasicus*). These species are caught ‘on demand’ as export orders are received, in order to reduce product storage costs.

- 121 Reported landings of kahawai progressively increased from 1977–1980 stabilising at about 5 000 tonnes between 1980–1985 and increasing thereafter to peak at 9 600 tonnes during 1987–88.
- 122 For the 1990–91 fishing year, a total commercial catch limit for kahawai was set at 6 500 tonnes, with 4 856 tonnes set aside for purse seining. The introduction of purse seine limits was effective in limiting commercial catches. The reported number of annual purse seining target sets on kahawai was reduced from about 250 sets in 1987–88 prior to the introduction of catch limits to average about 60 sets after their introduction. Purse seine landings reduced from about 8 500 tonnes in 1987–88 to 1 920 tonnes in 2003–04.
- 123 MFish notes that commercial purse seine catch limits applied only to purse seining when kahawai was the target species. Landings in some years in excess of catch limits were mostly due to landings of kahawai as bycatch.

Table 6: Reported catches (t) by purse seine method and competitive purse seine catch limit (t) from 1990–91 to 2003–04. All data are from weekly reports furnished by permit holders to the Ministry of Fisheries except those for 1993–94 that are from the CELR database.

Year	FMA 1		FMA 2		FMA 3		FMA 9		FMA 10		Total	
	catch	limit	catch	limit	catch	limit	catch	limit	catch	limit	catch	limit
1990–91	1 422	1 666	493	851	n/a#	2839 *	0	none	0	none	n/a	5 356
1991–92	1 613	1 666	735*	851	1 714	2339	0	none	0	none	4 080	4 856
1992–93	1 547	1 666	795*	851	1 808	2339	140	none	0	none	4 290	4 856
1993–94	1 262	1 200	1 101*	851	1 714	2339	15	§	0	none	4 092	4 390
1994–95	1 225	1 200	821*	851	1 644	2339	0	§	0	none	3 690	4 390
1995–96	1 077	1 200	805*	851	1 146	1500	0	§	0	none	3 028	3 551
1996–97	1 017	1 200	620	851	578	1500	0	§	0	none	2784	3551
1997–98	969	1 200	175	851	153	1500	0	§	0	none	1 297	3551
1998–99	1 416*	1 200	134	851	463	1500	2	§	0	none	2 015	3551
1999–00	1 371*	1 200	553	851	520	1500	0	§	0	none	2 444	3551
2000–01	1 322*	1 200	954*	851	430	1500	0	§	0	none	2706	3551
2002–02	838	1 200	747*	851	221	1500	0	§	0	none	1806	3551
2002–03	514	1 200	819	851	816	1500	0	§	0	none	2149	3551
2003–04	1203*	1 200	714	851	1	1500	0	§	0	none	1918	3551

By March 1991 when the catch limit was imposed, the purse seine catch had already exceeded 2339 t and the fishery was immediately closed. As the catch already exceeded 2339 t before the Minister's decision was announced, an extra 500 t was allocated to cover kahawai bycatch only.

§ Combined landings from KAH 9 and KAH 1 were limited to 1200 t.

• Purse seine fishery for kahawai closed.

- 124 While national catches decreased during 1991–92, landings in FMA 1 increased and for the 1993–94 the competitive catch limits for purse seining in FMA 1 were reduced from 1 666 tonnes to 1 200 tonnes and purse seine catches reported for FMA 9 were included in this catch limit. Purse seine catch limits were reached in KAH 1 between 1998–99 and 2000–01 and in 2003–04.
- 125 No changes were ever made to the purse seine catch limit of 851 tonnes for FMA 2. The FMA 2 purse seine fishery was closed early each year between 1991–92 and 1995–96 and between 2000–01 and 2001–02.
- 126 The purse seine catch limit for FMA 3 was reduced from 2 339 to 1 500 tonnes from 1995–96. In the past a southern purse seine fleet, based in Nelson, fished exclusively for mackerels and kahawai when fishing in southern waters. With the transfer of these vessels to Tauranga the purse seine target catch of kahawai in KAH 3 has declined from landing 1 500 tonnes in 1995–96 to reporting landings from the east coast South Island (Cloudy Bay to Kaikoura) since the 2002–03 fishing year.

Recent catch by fishing method and target species

- 127 Over the nine years prior to the introduction of kahawai into the QMS, catches by purse seining accounted for 75% of reported landings. Despite purse seine catch limits, catches by purse seining have fluctuated largely because of variable fishing effort in KAH 3. Most kahawai is taken as a target species almost entirely by purse seining apart from a small amount of seasonal fishing by setnet and ring net.
- 128 Trawling, set netting, ring net, bottom pair trawl, longlining, Danish seine/beach seine, and trolling each accounted for lesser amounts. The annual landings of kahawai taken by trawling have remained relatively stable with most of the catches in KAH 8. Set net landings have declined, as a result of set net area closures and changes in fishing patterns.
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Recreational fisheries

- 129 Kahawai is one of the fish species most frequently caught by recreational fishers. Bag limits apply but levels (15-20) are unlikely to greatly affect the total harvest. There is no minimum legal size for kahawai.
- 130 A survey of the Value of New Zealand Recreational Fishing undertaken by the South Australian Centre for Economic Studies (SACES) compared kahawai fishers with other recreational fishers. Kahawai anglers are characterised as follows: they go fishing significantly more times per year and are more likely to fish for eating purposes. They are more likely to fish from jetty or land platforms and are slightly more likely to catch and keep additional fish. They have a lower average fishing expenditure, have a higher male participation and are more likely to be a member of a fishing club.
- 131 The estimated number and harvest estimates of kahawai taken by recreational fishers from the various surveys are detailed in Table 4. Recreational harvest estimates by fish stock have been obtained from national telephone diary surveys undertaken in 1996 and 2000, with a follow up survey in 2001. Regional telephone diary surveys were undertaken in 1991/92 in the South Region, 1992/93 in the Central Region and in 1993/94 in the North Region.
- 132 The Recreational Technical Working Group recommends that the harvest estimates from 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 estimates are implausibly high for many important fisheries.

Table 7: Estimated number of kahawai harvested by recreational fishers by Fishstock. (Source: Tierney et al. 1997, Bradford 1997, Bradford 1998, Boyd & Reilly 2002, and Boyd et al. 2004).

Survey			KAH 1		KAH 2			
Year	Number	c.v. (%)	Range	Estimate	Number	c.v. (%)	Range	Estimate
1992/93	-	-	-	-	195000	-	245-350	297.5
1993/94	727000	-	920-1035	977.5	-	-	-	-
1996	666000	6	900-1020	960	142000	9	190-240	217
2000	1860000	13	915.6-2474.7	2195.1	1808000	74	769.1-5104.8	2937
2001	1905000	13	-	2248.3	492000	20	-	799.2

Survey			KAH 3		KAH 9			
Year	Number	c.v. (%)	Range	Estimate	Number	c.v. (%)	Range	Estimate
1991/92	231000	-	160-260	210	-	-	-	-
1993/94	6000	-	-	8.4#	254000	-	285-395	340
1996	226000	7	125-145	137	199000	9	195-225	204
2000	413000	16	563.5-771.3	667.4	337000	20	353.8-527.3	440.6
2001	353000	18	-	569.7	466000	24	-	608.5

#No harvest estimate available in the survey report, estimate presented is calculated as average fish weight for all years and areas by the number of fish estimated caught.

Customary catch

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

Illegal catch

134 No quantitative information is available on the level of illegal kahawai catch.

Other sources of mortality

135 There is no information on other sources of mortality. MFish notes that currently an arbitrary allowance has been set for incidental mortality on the basis of 2% of Maori customary, recreational and commercial utilisation.

136 Juvenile kahawai may suffer from habitat degradation in estuarine areas.

Stock assessment summary

137 The last assessment for kahawai was undertaken in 1997. A stock reduction model was used to obtain estimates of virgin biomass (B_0), the biomass level in 1996 (B_{1996}) and maximum constant yield (MCY) for a single nationwide kahawai stock.

138 A number of biological assumptions were used in the model and these are provided below in table 8. The most sensitive input parameter was the natural mortality of kahawai.

Table 8: Biological parameters used in the model

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

- 139 Catch curves derived for purse seine fishing in KAH 2, KAH 3 and KAH 9 during 1991–92 suggested a maximum value for total mortality of 0.31. Therefore, adjusting the maximum fishing mortality in any year so that the average fishing mortality and natural mortality combined was 0.31 probably made the estimates conservative. The average fishing mortality was calculated over the years 1980–92. Results of the model for various values of M (natural mortality) are provided below.

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

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

- 140 The above estimates are uncertain depending more on the model assumptions (a single stock, deterministic recruitment and the constraints on fishing mortality imposed) and input data than most New Zealand stock assessments. They may be regarded as conservative estimates as the estimates of total mortality in the model are based on the upper end of the range of values. The catch history is uncertain due to uncertainties in the commercial catch records, and the non-commercial catch history is uncertain with the assumed recent catches based on the 1996 diary harvest survey estimates. Estimates of MCY were calculated for a single national fishstock. MCY = pB₀ where p is determined from a method where the biomass does not go below 20% B₀ more than 20% of the time.
- 141 If the natural mortality of kahawai is assumed to lie between 0.15 and 0.25 the model estimates MCY ranging between 5,100 and 12,600 tonnes (see table 9).

Table 10: Summary of yield estimates (tonnes greenweight) and TACs for stocks of kahawai.

Fishstock	FMA	MCY	TAC
KAH 1 Auckland	1		3 685
KAH 2 Central (East)	2		1 705
KAH3 South-East, Southland, Sub-Antarctic, and Challenger	3, 4, 5 6, & 7		1 035 16
KAH 8 Central (West), Auckland (West)	8 & 9		1 155
KAH 10 Kermadec Is	10		16
Total		5 100–12 600	7 612

- 142 MCY estimates are unreliable and sensitive to key assumptions, but were thought to be conservative.
- 143 There are two species of kahawai present in New Zealand waters, kahawai and northern kahawai. This assessment applies only to kahawai and nothing is known about the other species.

New Information

- 144 The current research programme for kahawai is intended to provide information for a reassessment of kahawai stocks in 2007. The Minister asked MFish to fast-track research from the current research program in support of a review of catch limits and allowances in 2005.
- 145 Some new information is now available but for the most part this new information consists of preliminary findings or is limited in scope to certain parts of the fishery only. The Pelagic Fisheries Stock Assessment Working Group (PFSAWG) has recently evaluated this information. Preliminary findings of the working group are summarised below:

- a) KAH 2003/01: This project continues a time series of size and age composition data for recreational catches taken in KAH1. The sampling is undertaken in three main areas: east Northland, the Hauraki Gulf and the Bay of Plenty. In the Hauraki Gulf fewer kahawai were encountered in 2004 than in previous years despite increased levels of sampling. The majority of fish landed in the Hauraki Gulf are juveniles, and in recent years, the proportion of larger fish has declined. The age distribution of fish landed in East Northland has broadened over the last four years, with a higher proportion of older fish being caught. There has been less change in the Bay of Plenty, where catch rates are higher and the average age of those fish landed is greatest.

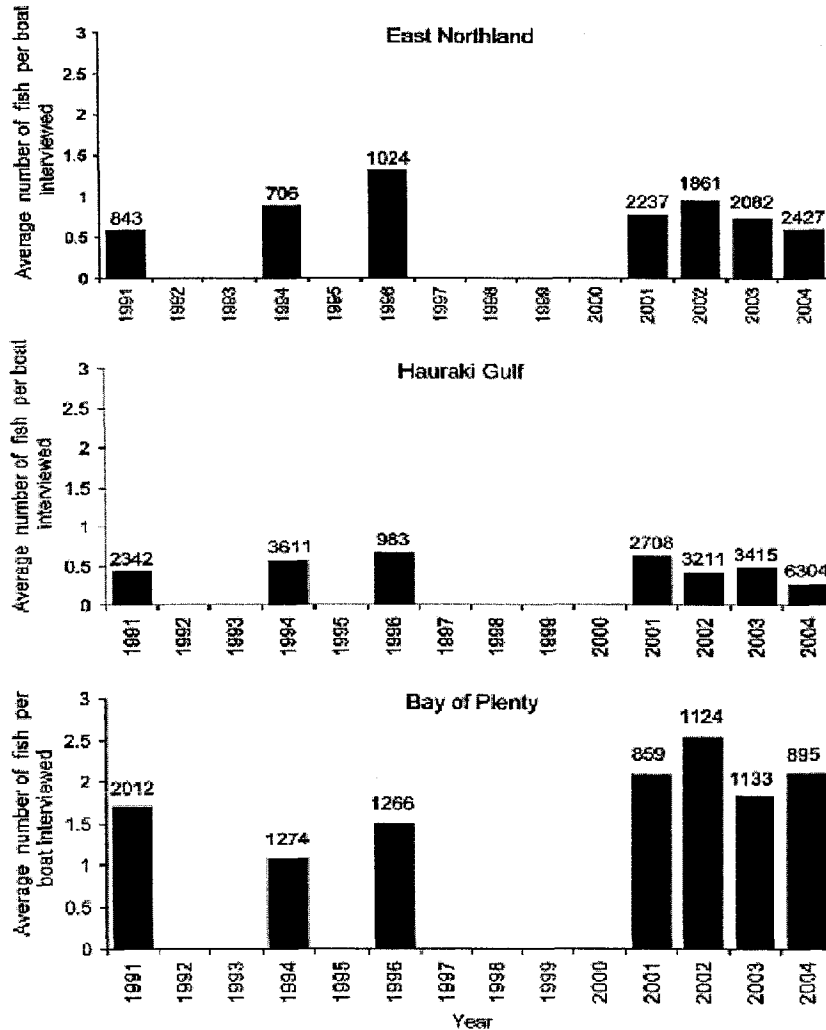
Boat ramp surveys conducted by the Ministry of Fisheries since 1991 provide unstandardised catch rates of kahawai by recreational fishers. It should be noted that these values included trips targeting other species (e.g., snapper) and therefore may be artificially low. The data are presented for the three main strata (East Northland, Hauraki Gulf and Bay of Plenty).

The average number of kahawai caught per trip in KAH 1 is highest in the Bay of Plenty, and lowest in the Hauraki Gulf (Figure 3). Since 1991, catch rates

have fluctuated in all three regions sampled, although there is some evidence of declining catch per trip in the Hauraki Gulf in recent years.

Data describing whether kahawai caught during the trip were released or used as bait were also collected. Most of the kahawai catch was landed, and boat ramp interviewers measured the majority of fish encountered. The highest catch release rates occurred in the Bay of Plenty (9% to 26%) where catch rates were highest, with the lowest release rates in East Northland (5% to 15%). A small proportion of the recreational kahawai catch was reported as being used for bait.

Figure 3: Catch rates of kahawai caught by recreational fishers in East Northland, the Hauraki Gulf and the Bay of Plenty, as reported by fishers interviewed during boat ramp surveys during the months of January to April since 1991. Numbers above histograms denote the number of fishing parties interviewed.



- b) PEL 2003/02: A preliminary relative index of abundance for kahawai has been developed based on aerial sighting data. Spatio-temporal tabulation of kahawai sightings by QMA showed that the most extensive and consistent sightings occur in KAH 1. Sightings in KAH 2 were considerably fewer and more variable, and those in KAH 3 were consistent and of good numbers between 1978–79. Kahawai sightings in KAH 8 have been low in most years. Accordingly, an area of the Bay of Plenty was selected for the preliminary index. A ‘combined model’ stepwise multiple regression using a delta-lognormal approach was used to produce time series of standardised annual relative abundance indices based on a measure of sighting rate as the response variable.

Trends in the analysis are variable depending on the assumptions made in standardising the index and assumptions about pilot learning. The combined model incorporates a model of tonnes sighted per hour flown and a model of presence with implied absence of sightings within a flight. The presence/absence data may add more information to the indices, but they require additional work to investigate the most appropriate selection of implied absence data before being usable in a stock assessment model. Additional work on the incorporation of environmental variables, expansion of the index to other areas and further standardisation are also required.

It is important to note that the above analysis is preliminary and the relationship between sightings and stock size are unknown.

- c) REC 2002/02: This project trials a new methodology using aerial over-flights and boat ramp surveys to estimate recreational snapper landings. The programme was expanded to better estimate kahawai landings. It cannot provide recreational harvest estimates for all of KAH 1 as the survey work was only undertaken in the summer of 2004 (temporal limitation) and only covered the Hauraki Gulf (spatial limitation). Based on previous surveys, the Hauraki Gulf was thought to contribute about 17% of the recreational kahawai landings for KAH1. Preliminary estimates of kahawai harvest for the summer months (1 December 2003 to 30 April 2004) suggest landings of 30.5 tonnes, which is considerably lower than previous harvest estimates for the Hauraki Gulf.

