REVIEW OF SUSTAINABILITY MEASURES FOR ALL KAHAWAI STOCKS (KAH 1, 2, 3, 4, 8 AND 10) OCTOBER 2010 – INITIAL POSITION PAPER

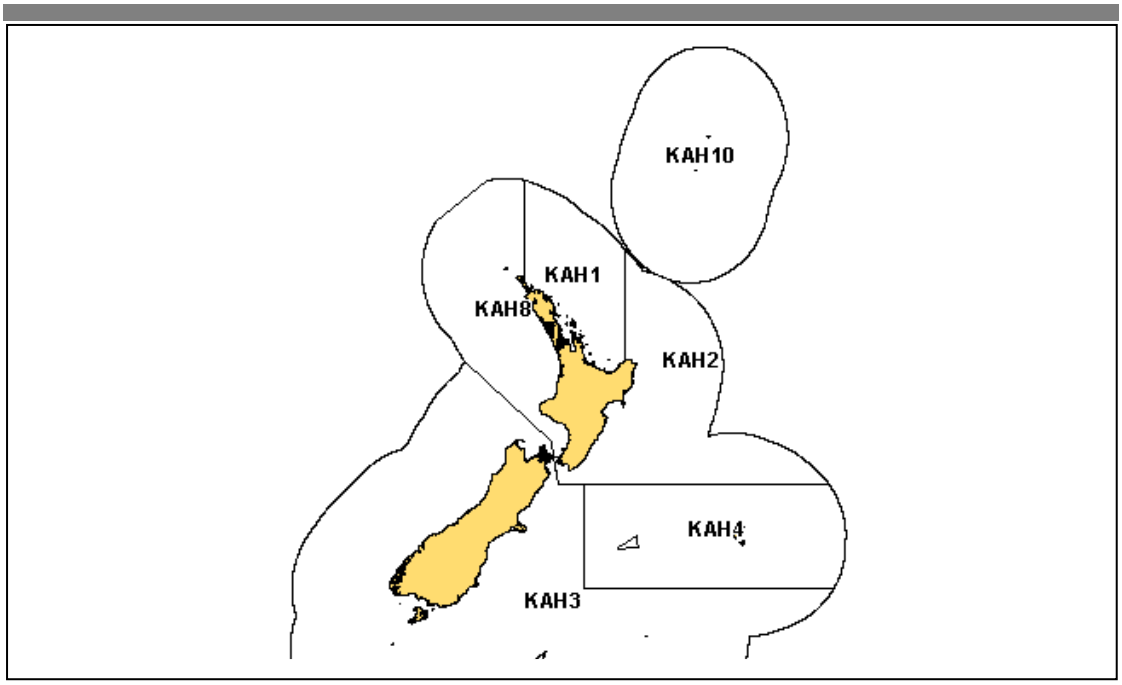


Figure 1: Quota Management Areas (stocks) for kahawai

Summary

1 The Ministry of Fisheries (MFish) is seeking tangata whenua and stakeholder information and views to inform a review of Total Allowable Catches (TACs), Total Allowable Commercial Catches (TACCs), allowances, and non-commercial management controls for all kahawai stocks (refer Figure 1).

2 Three options are proposed for reviewing the KAH 1 TAC, ranging from moving stock size upwards to 60% of the unfished stock size (Option 1), retaining the status quo (Option 2), or reducing the stock size to B_{MSY} (Option 3).

3 MFish's initial view is that Option 1 is the more appropriate option.

4 For KAH 2, 3, 4, 8 and 10, there is no new information on stock size or yields to inform altering the existing TACs. Given the lack of information, allocation options provided in this paper either reconfirm the status quo or propose varying the TACCs and non-commercial allowances to reflect the most recent estimates of current non-commercial catch (from 1999/2000). MFish's initial view is that the existing TACs, TACCs and allowances for these stocks should be retained, ie *status quo*.

5 MFish's initial view is that no additional non-commercial management controls are required at this time.

Reason for Reviewing the Catch Limits

6 Kahawai is an important shared fishery. Since introduction into the Quota Management System (QMS) in 2004, management decisions have been contentious culminating in legal challenges from both non-commercial and commercial fishers that extended to the Supreme Court. Following on from the Supreme Court decision in May 2009, the Minister indicated he would review all kahawai stocks during 2010.

Background

Kahawai fisheries

7 Kahawai stocks support important recreational, customary and commercial fisheries.

Recreational

8 Kahawai are highly sought after by recreational fishers who employ a range of shore and boat-based fishing methods. Recreational fishers account for a large proportion of the total kahawai catch by all sectors and it is one of few species that has this characteristic. A survey indicated kahawai is the third most important recreational species by weight caught in New Zealand.[1]

9 Kahawai are fished mostly for sport. Accordingly, kahawai have a much higher value as sporting fish than fish caught mainly for the table. Kahawai has been assessed as the second most valuable of five key New Zealand recreational species evaluated [2] by the South Australian Centre for Economic Studies (SACES). That assessment was based on non-market estimation techniques. The information, although dated, reinforces the qualitative information about the social and economic benefits recreational fishers receive from the kahawai resource.

10 There is considerable uncertainty in information used to assess species value because of difficulties in comparing non-market values such as marginal willingness to pay (MWTP) with market values such as annual catch entitlement (ACE), and the static nature of the value estimate. The SACES value estimate of MWTP was $3.50 per kg adjusted for inflation to the 2010 value. The MWTP is based on recreational catch estimates from 1996 that are towards the upper bound of estimates of current recreational landings. The estimate of MWTP is valid only for the time the survey was undertaken, although non-commercial fishers continue to highlight the value of the kahawai resource to them. It is also difficult for such a survey to provide information on the intrinsic values of the fishery (although contingent valuation techniques do attempt to incorporate intrinsic values).

Maori customary non-commercial

11 Kahawai is an important traditional and customary food fish for Maori non-commercial customary fishers. The level of Maori customary catch is not able

[1] Motivations and perceptions of seawater recreational fishers in New Zealand. Walshe, K, Ackroyd, J March 2000.

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

to be quantified, however, a substantial level of importance to customary interests was documented in past submissions. Kahawai is a known target species for customary purposes, especially on the seasonal runs around river mouths in the Eastern Bay of Plenty. (for further details on Maori customary fishing see Annex Two).

Commercial

12 There has been a long-established commercial fishery for kahawai using set nets and ring nets. However, it was not until the mid 1970s that there was a dramatic increase in kahawai commercial catch after New Zealand companies invested in a coastal purse seine fleet to target pelagic species. Purse seine vessels now rely on kahawai as a seasonal component of catches and take the bulk of commercial catches. Kahawai is in general a lower value species than others targeted by purse seine. Kahawai is also taken as bycatch in longline and trawl fisheries. For further details on commercial fishing see the 2010 Plenary Report section for kahawai.

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

Relative value

14 MFish considers that the estimates of MWTP derived from the SACES study for recreational fishers ($3.50 per kilogram as adjusted for inflation to the 2010 value) and the ACE price for commercial fishers ($0.28 per kilogram) provide some indication of relative social, economic and cultural value of the resource and the respective sectors' wellbeing derived from it. If these relative marginal values reflect the current situation, then kahawai are of significantly greater value to recreational fishers than to commercial fishers.

Biological Characteristics

15 Two species of kahawai are present in New Zealand waters, kahawai (*Arripis trutta*) and northern kahawai (*A. xylabion*). Under the QMS, both species are managed together as single stocks.

16 Kahawai are pelagic schooling fish that are widely distributed around New Zealand, but the main fishing grounds for kahawai are in the North Island, in particular the waters of the Bay of Plenty (KAH 1).

17 Returns from tagging programmes do not provide definitive information on the level of potential mixing between kahawai quota management areas (QMAs). These studies suggest that most kahawai remain in the same area for several years, but that some move. The pattern of kahawai movement around New Zealand is poorly understood and there are regional differences in age

structure and abundance that are consistent with limited mixing between QMAs.

18 Accordingly, any conclusions with regard to the KAH 1 stock status should not necessarily be applied to any other stock.

19 Kahawai grow rapidly, attaining a length of around 15 cm at the end of their first year, and maturing after 3–5 years at about 35–40 cm, after which their growth rate slows. The species is medium (with some low attributes) in terms of the *MFish Harvest Strategy Guidelines* for categorising productivity levels in exploited fish species.

20 Kahawai are often associated with pelagic prey species such as juvenile jack mackerels, pilchards, anchovies, sprats, yellow-eyed mullet, whitebait and pelagic crustaceans such as krill. Kahawai are prey for other species such as kingfish, sharks, tunas and billfish. The presence of kahawai is a factor in the seasonal availability of these gamefish. Further, as predators, kahawai form an important ecological relationship with their prey, some seabirds, and possibly with marine mammals.

Stock Status

KAH 1

21 Since the 2005 review, the following new information is available for KAH 1:

- The Fisheries Assessment Plenary accepted a stock assessment for KAH 1 in 2007.[3] The 2007 assessment concludes it is likely that the current spawning biomass of KAH 1 is at or above the biomass level that can produce the MSY, but it is uncertain how far above. Projections based on the 2007 assessment, and current TACC and assumed non-commercial removals, predict biomass to increase over five years (2008-2013).
- The 2007 KAH 1 assessment is not as comprehensive as stock assessments for some other species such as hoki. The assessment lacks fishery-independent information on abundance (e.g. surveys), and total annual catches are not well understood due to the considerable uncertainties – most notably in non-commercial catches.
- A key parameter of uncertainty is the non-commercial catch history. The most plausible estimates of recreational catch are between 500-900 tonnes. (See Annex Three for more detailed information on recreational catch estimates). However, assumed non-commercial catch history has little influence on the predicted stock status – although the assumed level of removals will influence the yields estimated by the assessment. Current assumed removals are lower than almost all estimates of deterministic maximum sustainable yield (MSY). Combining this with the result that most estimates of recent biomass are well above B_{MSY}, the 2010 Plenary reports it is unlikely that the stock will decline below B_{MSY} at current assumed catch levels, given the model recruitment assumptions.

[3] For further details of stock assessment see *Assessment of the KAH 1 stock for 2006* and the *Addendum to the assessment of the KAH 1 fishery for 2006 – analysis of management options*

Other kahawai stocks

22 No accepted assessment for any other stocks of kahawai is available. It is not known if the current catches, allowances or TACCs are sustainable. The status of KAH 2, 3 4, 8 and 10 relative to B_{MSY} is unknown.

Current management

Table 1 Current TACs, Allowances and TACCs for all KAH stocks (tonnes).

Fish stock	TAC	Customary Allowance	Recreational Allowance	Fishing related mortality	TACC
KAH 1	3,315	495	1,680	65	1,075
KAH 2	1,530	185	610	30	705
KAH 3	935	115	390	20	410
KAH 4	14	1	4	0	9
KAH 8	1,040	115	385	20	520
KAH 10	14	1	4	0	9

23 When kahawai was introduced into the QMS in 2004, TACs were based upon combined levels of estimated use by all sectors of the kahawai fishery at that time. However, because these combined estimates exceeded reference points of sustainable yield for kahawai relied on at that time, the Minister concluded utilisation of kahawai stocks at that time might not be sustainable. To ensure sustainability the Minister set the initial TACs at a level 15% less than the combined level of commercial and recreational use at that time.

24 To provide greater certainty that kahawai stocks would rebuild, TACs, TACCs, and allowances for all kahawai stocks were reduced by a further 10% to the current levels in 2005. The current TAC, allowances and TACC for kahawai fishstocks are given in Table 1.

Proposed management options

Discussion of Total Allowable Catch (TAC) proposals – KAH 1

Table 2 Proposed TAC, Allowances and TACC options for KAH 1 (tonnes).

Option	TAC	Customary Allowance	Recreational Allowance	Fishing related mortality	TACC
KAH 1					
Option 1	2,190	200	900	45	1,045
Option 2	2,220	200	900	45	1,075
Option 3	2,885	200	900	60	1,725

25 Table 2 sets out the options proposed for KAH 1.

26 The assessment for KAH 1 concludes the current spawning stock biomass (SSB) is likely to be greater than B_{MSY}. Section 13 of the Fisheries Act 1996 (the Act) provides that the biomass of the stock should be managed at or above a level that can produce MSY, having regard to the interdependence of stocks.

27 For stocks whose biomass is currently above the level that will produce MSY, the Minister may set a TAC that:

- maintains the stock at or above a level that can produce the maximum sustainable yield, having regard to interdependence of stocks (s 13(2)(a)); or

- enables the level of any stock whose current level is above that which can produce the maximum sustainable yield 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 maximum sustainable yield, having regard to the interdependence of stocks (s 13(2)(c)).

Interdependence of stocks

28 Interdependence of stocks is where there is a direct trophic (ie a stock is likely to be directly affected through a predator or prey relationship by the abundance of another stock) or symbiotic relationship between stocks. Kahawai has roles in both aspects as noted below.

29 In considering the interdependence of stocks, MFish notes kahawai swim in schools of similar sized fish and often mix with those of other pelagic species. Kahawai are associated with pelagic prey species. Kahawai are preyed upon by other species - primarily gamefish. Kahawai availability as prey is a factor in the seasonal availability of these sought-after gamefish.

30 As predators, kahawai form an important symbiotic relationship with their 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, including seabirds. There is no information on whether current kahawai fishing activities are detrimental to the long-term viability of any other species. However, there are gamefisher concerns about the effect any reduction in kahawai schools might be having on interdependent stocks of predators such as kingfish, marlin and tuna. The factors influencing the distribution of highly migratory stocks of these species are complex and not well understood.

Social, cultural and economic factors

31 The Minister shall also have regard to such social, cultural, and economic factors as he considers being relevant when determining the way and rate at which to move the stock biomass toward or above the B_{MSY} level. Qualifying factors are relevant in the determination of the way and rate, rather than in the determination of the target stock level – accordingly this requirement is relevant only to TAC options that propose either to increase or decrease biomass from current levels.

32 MFish has a policy preference expressed in Fisheries 2030 to have "New Zealanders maximising benefits from the use of fisheries within environmental limits". Supporting this policy is the outcome – "Fisheries resources are used in a manner that provides the greatest overall economic, social, and cultural benefit". This means having:

- An internationally competitive and profitable seafood industry that makes a significant contribution to our economy

- High-quality recreational fisheries that contribute to the social, cultural, and economic well-being of all New Zealanders

- Thriving customary fisheries, managed in accordance with kaitiakitanga, supporting the cultural well-being of iwi and hapū

- Healthy fisheries resources in their aquatic environment that reflect and provide for intrinsic and amenity value.

Taking account of the Hauraki Gulf Marine Park Act 2000

33 Section 7(1) of the Hauraki Gulf Marine Park Act 2000 provides:

> "The interrelationship between the Hauraki Gulf, its islands, and catchments and the ability of that relationship to sustain, the life-supporting capacity of the environment of the Hauraki Gulf and its islands are matters of national significance."

34 So far as this is relevant to TAC decisions, this can be summarised as relating to the protection, maintenance and enhancement of natural and physical resources in order to provide for the social, economic, recreational and cultural well-being of people and communities. Annex One contains further information.

35 Recreational catches in the Hauraki Gulf are generally of smaller and younger kahawai than taken in other parts of KAH 1. MFish cannot determine whether this situation is because of fishing practices or environmental factors. Catch and catch rates in the Gulf may fluctuate in response to variation in recruitment. Further, changes in catch rates could be associated with a change in the factors that influence the movement of kahawai into or out of the Hauraki Gulf. If commercial catches within KAH 1 have affected non-commercial fishers' access to the resource within the Hauraki Gulf, it might be more appropriate to set a TAC towards the lower end of the range to try and address this.

36 Any TAC decision the Minister makes in relation to KAH 1 will need to consider possible impacts on both commercial and non-commercial users of the resource within the Gulf, and the wellbeing of all sectors. MFish invites respondents that submit on this IPP to provide any additional information that they have on the importance of kahawai to the social, economic, recreational, and cultural wellbeing of people in the Hauraki Gulf.

TAC options for KAH 1

37 Three options are proposed for reviewing the KAH 1 TAC, as follows:

- Option 1 (**60% of B_0**) – TAC based on increasing the spawning stock biomass (SSB) towards 60% of the unfished stock size;

- Option 2 (**"*Status quo*"**) – TAC based on retaining the *status quo* TACC and non-commercial harvest levels;

- Option 3 (**35% of B_0**) – TAC based on reducing the spawning stock biomass towards B_{MSY}.

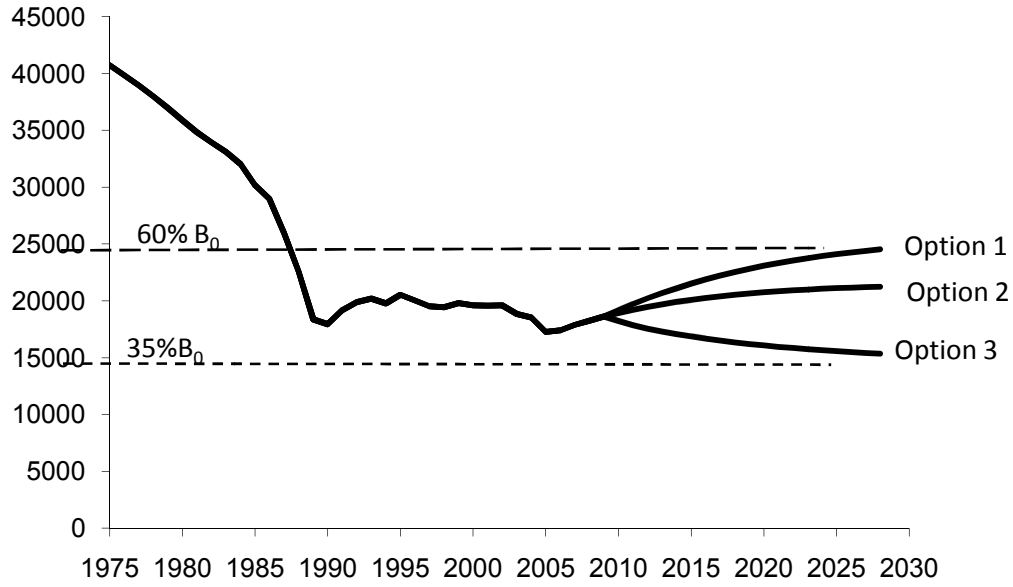
38 A series of management strategies was evaluated by the 2007 stock assessment model. MFish has proposed two TAC options based on outputs from the model (Options 1 and 3). Option 2 is the TAC based on retaining the *status quo* TACC and non-commercial harvest levels.

39 In using these model outputs it was assumed that levels of Maori customary catches and incidental mortality were relatively constant over time and that these may be treated as an on-going yield over and above yield outputs generated from the model. In other words, estimates of customary catch and incidental mortality were added to model-estimated yields used as the basis for deriving TACs in Table 2, rather than treated as a component and subtracted from model outputs of yield.

40 According to the *MFish Harvest Strategy Standard Guidelines*, the biological characteristics of kahawai suggest it is a medium productivity species. The Guidelines indicate that the default analytical proxy for B_{MSY} for kahawai should be no less that 35% of the unfished biomass (B_0). MFish uses 35% B_0 as the B_{MSY} reference for the options proposed in this paper.

41 Figure 2 shows trajectories of biomass associated with the three proposed options as determined by the stock assessment model. It is important to note under options 1 and 3 that reaching the target biomass is not predicted to occur until about 2028. The relative benefits and costs discussed below should be viewed in this context. MFish has outlined social, economic and cultural factors that are relevant to the rate at which to move the stock towards a level at or above B_{MSY}.

Figure 2 KAH 1 historical and projected biomass for the three TAC options based on the 800 tonne non-commercial catch history. Vertical axis is spawning stock biomass (tonnes), horizontal axis is years AD.



Evaluation of TAC options - KAH 1

Option		Benefits	Costs
1	Vary the TAC to 2,190 tonnes in order to increase the biomass towards 60% of the unfished stock size	Provides benefits in relation to interdependence of stocks by maintaining a higher stock size so kahawai is more abundant as a prey species.	Does not provide opportunity to maximise yield from the fishery.
		Provides greater social, economic and cultural benefits for recreational and customary fishers by providing for more abundance, and potential for the range of the stock to expand. Evidence submitted by recreational fishers indicates that they are more concerned with the length of time taken to catch fish and the size of available fish, than with the total tonnage of fish.	If biomass increases, commercial fishers may find it more difficult to manage their bycatch of kahawai.
		Providing greater benefits for recreational and customary fishers would also address the	

		objective: • in Fisheries 2030 of maximising benefits from the use of fisheries; and • in the Hauraki Gulf Marine Park Act of enhancing natural resources that contribute to the recreational and cultural well-being of people and communities.	
		Recreational and customary catches are likely to progressively increase with greater abundance (availability). Future considerations will include the need to consider increasing allowances or to alter constraints on recreational catches – perhaps no earlier than 2014 - as indicated by projections from the 2007 assessment.	
		There may be efficiency gains in target fisheries for commercial fishers through increased catch rates and easier location of fish.	Purse seine operators say the overall viability of the fishery is dependent on kahawai catches. Some social and economic impact on commercial fishers is expected but mitigated by the relative small – and low value - of the catch reduction.
2	Vary the TAC to 2,220 tonnes in order to maintain the status quo TACC with biomass above B_{MSY}	Maintains current availability and size range of kahawai and is therefore neutral in terms of: • interdependence of stocks • impacts on commercial, recreational and customary fishing	Recreational fishers say they are not satisfied with current availability and size range of kahawai.
		Maintains the current balance in the Hauraki Gulf Marine Park Act objective of providing for the social, economic, recreational and cultural well-being of people and communities.	Due to limited opportunity to increase benefits for high value recreational and customary fishing, this option may not address the objective expressed in

			Fisheries 2030 of maximising overall benefits from the use of fisheries.
3	Vary the TAC to 2,800 tonnes in order to move the biomass downwards towards B_{MSY}	Maximises the yield from the fishery whilst still ensuring sustainability.	Reduces current availability and potentially the range of fish and is therefore detrimental in terms of • impacts on recreational and customary fishing • interdependence of stocks
		Provides greater social and economic benefits for commercial fishers by providing a greater level of catch	Due to the potential for reducing benefits for high value recreational and customary fishing, this option does not address the objective expressed in Fisheries 2030 of maximising overall benefits from the use of fisheries.
		Shifts the balance in the Hauraki Gulf Marine Park Act objective to provide for the social, economic, recreational and cultural well-being of people and communities, to more favour commercial fishers and some consumers in particular.	Recreational and customary catches are likely to progressively decrease as biomass is fished down. Future considerations will include the need to consider decreasing allowances.

Discussion of TACC and allowance options - KAH 1

42 The TAC is the primary sustainability measure for a fish stock and is intended to include all sources of fishing and fishing-related mortality. Section 21 of the Fisheries Act 1996 requires the Minister to allow for:

a) Maori customary non-commercial interests,

b) recreational interests;

c) and other sources of fishing-related mortality.

within the TAC before varying the total allowable commercial catch (TACC).

43 TACs should be fully allocated. Allowances represent what the Minister considers non-commercial interests should be able to catch, but also what they will be able to catch having regard to any controls the Minister may impose such as bag limits and fishing seasons. Questions of allocation are ultimately a policy decision for a properly informed Minister, acting within the

framework of the Act. The Act does not confer any priority for any interest over any other.

44 MFish considers that the following factors are relevant to the exercise of the Minister's discretion in terms of allocating the TAC for kahawai:

a) historic and current use by various sectors;

b) importance of the resource to various sectors and the impact of allocation decisions;

c) importance of taking an equitable approach to allocation;

d) current status of the stock.

Maori customary non-commercial allowance – KAH 1

45 Limited information is available at present from reporting of customary catches. The lack of information is not thought to reflect the importance or otherwise of kahawai as a species of customary interest. Rather, the lack of data reflects that many iwi are operating under transition from regulation 27 and 27A of the Fisheries (Recreational Fishing) Regulations 1986, in which reporting was non-mandatory - for reported customary landings see Table 3.

Table 3 Reported landings in kilograms* from MFish customary fishing database.

Year	KAH 1
2005	150
2006	70
2007	80
2008	1021
2009	974

Where the number of fish were reported these were converted to weight at unity on the basis that the recreational catch is mostly 4 year old fish or 40cm that from length weight curves provides a weight close to 1:1.

46 MFish notes that more iwi and hapu are Gazetting their rohe moana, and becoming subjected to mandatory customary reporting measures. The allowance made for customary fishing should be able to satisfy customary interests. In any event customary fishing is not subject to daily bag limits or other restrictions that could reduce the actual customary take.

47 In the meantime, setting appropriate customary allowances is difficult. In 2004 and 2005, 25% of the recreational allowance was used as the basis for providing an allowance for Maori customary fishing. The rationale was that this was an appropriate basis on which to base the Maori customary allowance. The use of 25% reflects that while kahawai is undoubtedly an important customary species, it is most unlikely that the catch is anywhere near the level of the recreational catch. The number of recreational fishers taking this species is likely to significantly exceed the numbers of customary fishers. Further, a proportion of the catch taken to fulfil customary purposes is

probably taken within the bounds of the daily recreational allowance of up to twenty kahawai per person.

48 It is proposed that the customary allowance for KAH 1 be varied to 200 tonnes, based on the considerations listed above and in tandem with the proposed change to the recreational allowance. MFish notes that, although this is a reduction to the existing allowance, it does not reflect a constraint on customary fishing. Rather it is a correction to the allowance to reflect new information on recreational harvest.

49 MFish invites respondents that submit on this IPP to provide any additional information that they have pertaining to the setting of allowances for Maori customary fishing.

Recreational allowance – KAH 1

50 MFish considers estimates of historic and current use of the fishery provide a starting point for setting a recreational allowance.

51 As discussed in Annex Three estimating historic and current recreational catch is problematic. Estimates of current use may not fully reflect the value of the resource to each sector. MFish considers it may be appropriate to provide for an allowance at the upper level of estimates of current recreational catch, for the following reasons:

- there is substantial uncertainty about estimates;
- current use may have been constrained by past/current commercial fishing, and therefore does not accurately reflect the past importance of the fishery to recreational fishers, or desired future use;
- recreational catch of kahawai is likely to be variable from year to year, but harvest estimates are for a single point in time;
- to better reflect recreational fishers' ability to provide for their social economic and cultural wellbeing;
- implications for recreational catches of changing biomass.

52 The SACES study suggests non-commercial fishers gain greater wellbeing from the resource than commercial fishers. Providing for a higher recreational allowance would reflect the high value of the fishery to recreational fishers. However, it must be acknowledged that the information that suggests that the fishery provides more benefits to recreational, than commercial, fishers is dated and uncertain.

53 For KAH 1, MFish proposes an allowance of 900 tonnes for recreational fishing interests based on the upper bound of the most plausible estimates of current use. This proposal provides for social, economic and cultural wellbeing, but not beyond what currently might reasonably be expected to be caught. This single proposal for the recreational allowance relates to all TAC options. MFish notes that, although this is a reduction to the existing allowance, it does not reflect a change to the current constraints on

recreational fishing. Rather it is a correction to the allowance to reflect new information on recreational harvest.

54 Although MFish has recommended a single option, the Minister may choose to set a different allowance. MFish invites respondents that submit on this IPP to provide any additional information that they have pertaining to the setting of allowances for recreational fishing.

Fishing-related mortality – KAH 1

55 Fishing-related mortality is likely from all sectors in the fishery. In 2004 and 2005, 2% of the TAC was used as an arbitrary basis for providing an allowance for all other sources of fishing-related mortality. This allowance assumed small amounts of fishing-related mortality across all commercial fishing methods and including recreational fishers (that are known to practise catch and release resulting in further unknown levels of incidental mortality). It is not intended that this allowance serve as a constraint, rather to recognise the current unintended consequence of fishing.

56 The level of incidental mortality will vary depending on the management options being considered and are based on assumptions that require further investigation.

TACC – KAH 1

57 Proposed TACCs for KAH 1 are set out in Table 2. The different TACC options arise only as a consequence of varying the TAC and only one TACC option is proposed for each TAC option.

58 Options for varying TACCs in KAH 1 will have a number of possible economic effects on industry.

59 MFish has estimated the following potential loss of economic return in NZ$:

a) loss in earnings from kahawai (based on port price);

b) loss in earnings from ACE sales;

c) loss in earnings from export sales (assumes all catch would be exported).

60 Quota value may also change as a result of TACC reductions. However, the degree to which it will change is difficult to estimate without a full economic assessment of the fishery.

61 The ACE value estimates the forgone annual earnings for quota owners associated with selling ACE. Average ACE for the 2008-09 fishing year in KAH 1 is $284 per tonne. The port price reflects what fishers receive for their fish prior to costs being taken into account. The 2008-09 port price is $230 per tonne for KAH 1.

62 An important source of earnings from the kahawai fishery is derived from exporting. The principal market is Australia (in the form of frozen whole fish). The 2009 average unit price is $1,070 per tonne.

63 The assessment of the potential economic loss to industry associated with TACC options is summarised in Table 3. It is important to note financial implications of adopting Option 1 may be considerably greater than this assessment suggests going forward – depending on future management outcomes.

Table 4 **Possible annual opportunity costs and benefits associated with changes to KAH 1 TACCs (based on ACE, port price, and export price).**

	Option 1	Option 2	Option 3
Change from status quo	-30 tonnes	0	+650 tonnes
ACE price (NZ$)	-$8,520	0	$184,600
Port price (NZ$)	-$6,900	0	$149500
Export price (NZ$)	-$32,100	0	$695,500

64 Commercial fishers also derive value from the kahawai fishery that is not directly related to the value of the fish caught. The kahawai fishery allows fishing vessels to continue operating throughout the year, particularly when the key target species are not in season. This means the costs associated with not fishing are avoided – these costs include berthing, and laying off and rehiring crew.

TAC proposals for other KAH stocks

Table 5 **Proposed TAC, Allowances and TACC options for other KAH stocks (tonnes).**

Fish stock	TAC	Customary Allowance	Recreational Allowance	Fishing related mortality	TACC
KAH 2					
Option 1 *Status quo*	1,530	185	610	30	705
Option 2	1,530	185	800	30	515
KAH 3					
Option 1 *Status quo*	935	115	390	20	410
Option 2	935	115	510	20	290
KAH 4					
Status quo	14	1	4	0	9
KAH 8					
Status quo	1,040	115	385	20	520
KAH 10					
Status quo	14	1	4	0	9

65 Proposed TACs for all other stocks are set out in Table 5.

66 Given the assumption of multiple stocks with limited mixing, the stock assessment result that KAH 1 is above B_{MSY} does not necessarily shed any light on the stock status of any other kahawai stocks. As there is no available stock assessment, the state of these stocks in relation to B_{MSY} is unable to be estimated. MFish proposes the TACs be set under s.13 (2A) of the Act. This requires that TACs are not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

67 For KAH 2, 3 and 8 there is no new information available to inform altering the existing TACs. Given the uncertainty and lack of information, it is proposed to retain the existing TACs for these stocks on the basis that the current TACs are not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield. A national stock assessment for kahawai is expected in 2012 and should provide new information for reviewing these stocks at that time.

68 For the remaining stocks (KAH 4 and KAH 10) that are based on nominal values, retaining the status quo is also proposed.

TACC and allowance proposals for other KAH stocks

KAH 2 and 3

69 Option 1 retains the status quo for KAH 2 and 3 and reflects a cautious approach to change given the lack of recent information about the level of current non-commercial landings and the uncertainty surrounding estimates (see Annex 3).

70 Option 2 sets a higher recreational allowance (and reduced TACC) based on 2004 estimates of recreational catch. As described in Annex Three, the surveys on which the 2004 estimates are based are now subject to significant qualifications. Providing for a higher recreational allowance would reflect the high value of the fishery to recreational fishers. However, it must be acknowledged that the information that suggests that the fishery provides more benefits to recreational, than commercial, fishers is dated and uncertain.

71 Recreational fishing surveys are due to start in 2011 and a national stock assessment for kahawai is proposed for 2012. Until such time as this information becomes available, MFish's initial view is to adopt a more cautious approach of retaining the *status quo* TAC, TACC and allowances (Option 1).

KAH 8

72 The TACC for KAH8 is set at a level that allows almost entirely for bycatch of kahawai in other target fisheries. There is a greater risk of economic impacts to Industry of a TACC reduction in this fishstock than for other fishstocks. There was a consensus among stakeholders for retaining the status quo in 2005. Accordingly MFish has proposed the *status quo* (Option 1) only for KAH 8.

KAH 4 and 10

73 For these remaining stocks the status quo is proposed. These TACCs and allowances were set on nominal values based on scant information. No further information apart from commercial catch is available.

Other Management Controls

Review of management measures to control recreational landings

74 At present, there is no minimum legal size (MLS) for kahawai. The size selected by recreational fishers is poorly understood although the scant data suggests kahawai is landed regardless of size – with small kahawai popular as bait. Without a better understanding of size selectivity and fisher behaviour it is difficult to assess how effective a MLS would be to control landings in recreational fisheries.

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

KAH 1

76 The proposal for varying the recreational allowance in KAH 1 is based on the most plausible estimates of the current levels of catch. Accordingly there is no reason to consider other management measures at this time. Over the longer term, MFish is concerned to ensure management measures are in place to protect the integrity of TACs set for QMS stocks. If the stock size is allowed to increase from current levels (as is proposed by TAC option 1 for KAH 1), then with increased availability, non-commercial catches are also likely to increase. Accordingly, adopting this TAC option will require consideration of additional management measures (such as reducing bag limits) in the future. Changes to bag limits are required only as biomass increases and this may occur around 2014 - as indicated by projections from the 2007 assessment.

Other KAH stocks

77 As discussed in Annex 3, there is considerable uncertainty about estimates of recreational catch. Anecdotal evidence from the recreational sector suggests that, in the short term, recreational catches are within the allowances that are currently set for these stocks even if no change is made to daily bag limits. MFish has no information to confirm or refute this.

78 Should the Minster choose to retain the status quo allowances for other kahawai stocks, MFish considers that a reduction in the daily bag limit need not be required despite these allowances being based on a theoretical 15% reduction in the recreational catch. This is because of the considerable uncertainty about the 1999/2000 recreational diary harvest estimate these allowances were based on and their potential for overestimation.

79 MFish invites respondents that submit on this IPP to provide any additional information that they have with respect to the management controls on recreational fishers.

Management of commercial landings

80 Under the 1996 Act, overfishing is controlled in the first instance by the application of graduated administrative disincentives (interim and deemed values). This deemed value framework provides an incentive for fishers to acquire sufficient ACE to balance against catch. The current deemed values set for kahawai are shown in Table 6. Standard ramping provisions apply to all kahawai stocks.

Table 6: Deemed values for kahawai:

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

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

82 Pelco New Zealand Ltd (Pelco) has requested in the past that kahawai be included on the Sixth Schedule of the Fisheries Act to reduce the socio-economic impact of constraining TACCs and provide fishers with some flexibility to control catch. Pelco proposes any species of kahawai taken by the fishing method of purse seine could be returned to the water as would be allowed by placing kahawai on the Sixth Schedule of the Act.

83 Schedule 6 allows specifically conditioned exemptions to normal statutory requirements. Accordingly, kahawai taken by purse seine may be returned to the water subject to a Schedule 6 condition that the fish are likely to survive release. Pelco has reviewed available information and assessed kahawai released from a purse seine net are likely to survive. The basis for their review was a small scale survivability study of 78 fish caught by line and lures in 1984 which suggested all untagged kahawai, and 93% of those tagged, survived. Further, Pelco also note that some kahawai tagged and released from purse seine catches were recaptured. MFish agrees the small-scale study supports that line-caught kahawai tagged and released are likely to survive, however, the mortality rate due to capture by purse seine net is unknown.

84 This proposal would require further consideration of survivability of purse seine caught kahawai as well as the consideration of related compliance

matters. MFish proposes to defer further consideration of kahawai stocks being included on the Schedule 6 until such time as this matter may be considered as part of the National Inshore Fisheries Plan for Finfish and subject to operational priorities.

MFish's Initial View

85 MFish has outlined social, economic, and cultural factors that support moving KAH 1 further above B_{MSY} to provide for greater abundance of kahawai, and an increased potential for the range of the stock to expand. This outcome also supports the Fisheries 2030 objective of maximising benefits for the use of the kahawai fishery by providing better overall economic, social and cultural benefit with increased use by non-commercial fishers. It provides a greater level of wellbeing to recreational and customary fishers using the Hauraki Gulf Marine Park and has better regard to the interdependence of stocks by making kahawai more abundant as a species. The impact of increasing biomass further above B_{MSY} on the commercial sector is a potential loss of annual export income of tens of thousands of dollars, but this may be considerably greater going forward – depending on future management outcomes.

86 The preliminary analysis suggests that for KAH 1, the proposed TAC Option 1 best achieves these outcomes. Accordingly, MFish's initial view is to adopt Option 1.

87 For KAH 2, 3, 4, 8 and 10 there is no new information available for altering the existing TACs, TACCs, and allowances. MFish's initial view is that retention of the *status quo* TAC and allowances for the above stocks would be appropriate.

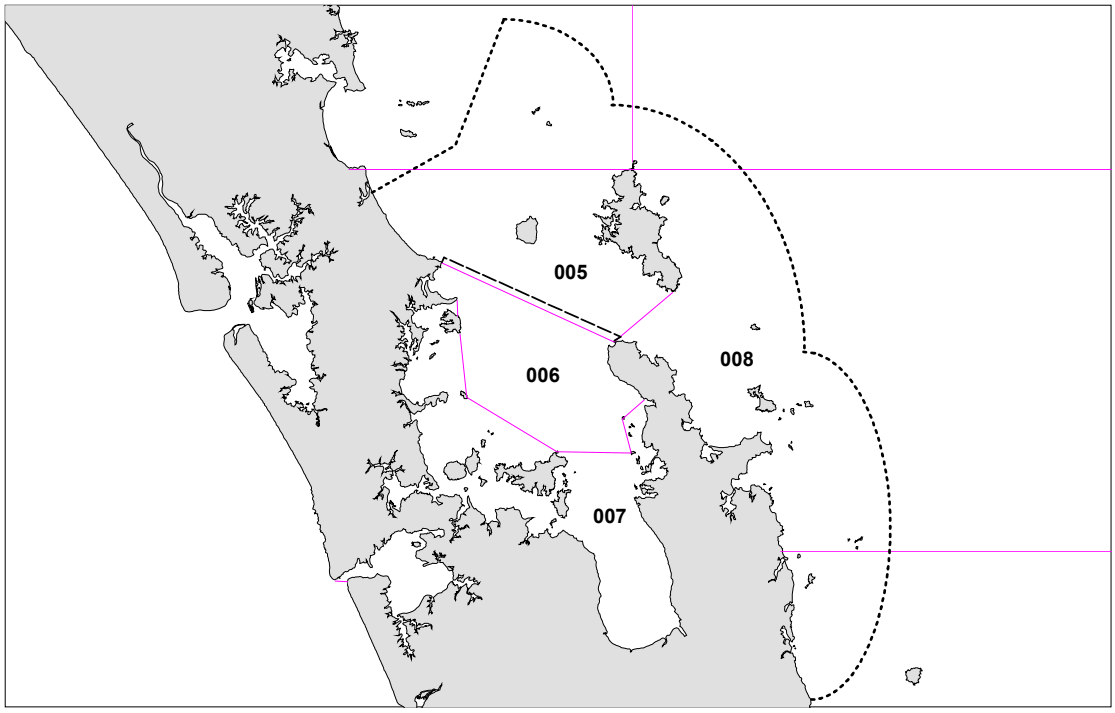
88 MFish's initial view is that no additional non-commercial management controls are required at this time.

Annex One

Characterisation of non-commercial and commercial use of kahawai in the Hauraki Gulf Marine Park

89 The Hauraki Gulf Marine Park covers the Hauraki Gulf, Waitemata Harbour, Firth of Thames and the east coast of the Coromandel Peninsula (Map 1).

Map 1: **Map of the Hauraki Gulf Marine Park seaward boundaries (dotted line) showing statistical areas 005, 006, 007 008 (solid line) used by commercial fishers for reporting catches and boundary of the area (dashed line) used for assessing recreational harvest in the inner Hauraki Gulf during 2003-04 and 2004-05.**



Recreational use

90 The Hauraki Gulf is a high-use recreational fishing area. The combination of extensive shoreline, sheltered waters of the inner Gulf and Waitemata Harbour, the close proximity to Auckland, and the large number of privately owned boats in the region result in intensive recreational fishing activity particularly during the summer months.

91 Sampling of recreational catches has taken place annually in East Northland, the Hauraki Gulf and the Bay of Plenty since 2001 (and intermittently since 1991). Such sampling suggests there are consistent regional differences in the length and age compositions of kahawai among these regions. In the Hauraki Gulf, recreational landings of kahawai are regularly dominated by small fish (three year olds), with low proportions of fish older than five years. It is improbable that these regional differences in age structure can be attributed to relative fishing pressure alone, which suggests that the Hauraki Gulf is an area populated by predominantly juvenile kahawai.

92 Information from boat ramp interviews conducted since 1990/91 show catch rates have fluctuated. There is some evidence of declining catch per trip in the Hauraki Gulf in recent years. However, it was only in 2003-04 that fisher success was noticeably lower than those experienced in the early 1990s. The reasons for the apparent decline in recreational catch rates within the Hauraki Gulf are not clear.

93 Aerial overflight surveys also suggest highly variable non-commercial catches of kahawai between years within the Hauraki Gulf. Recreational harvest estimates for 2003-04 and 2004-05 vary between 56 and 98 tonnes. These values contrast with a 2000 estimate of recreational catch for the Hauraki Gulf of 180 tonnes. The difference in recreational kahawai landings between the aerial surveys and the 2000 telephone diary survey may be explained either by the 2000 estimate of recreational catch in the Hauraki Gulf being an overestimate, by landings fluctuating, or by recreational landings having declined since 2000.

Customary use

94 The Hauraki Iwi Environmental Plan (2004) notes: "Hauraki moana have been used and valued by Hauraki people since beyond living memory for cultural, spiritual and economic purposes. Hauraki Whänui have been continuously engaged in fishing, a tradition that expanded to accommodate a supply of fresh fish to Auckland in the 19th century."

95 Hauraki Maori Trust Board's Strategic plan for the customary fisheries of Hauraki, 2002 – 2052 provides an overview of the customary fisheries of Hauraki. Kahawai is listed as a key component of customary fisheries in the Firth of Thames, Waihou River, and Manaia. The strategy expresses concern about declines in customary fisheries: "These fisheries were at one time abundant teeming as they were with seafood (fish and shellfish) but have been greatly diminished over time by degradation of habitats (through pollution) and depletion through over-fishing." Some of this concern focuses specifically on shellfish resources, rather than kahawai. One of the key goals of the strategic plan is an abundant and well-managed customary fishery.

Commercial use

96 Most of the commercial catch of kahawai from KAH 1 is taken from the Bay of Plenty, rather than the Hauraki Gulf. However, since 2004, landings reported from statistical areas 005, 006, 007, 008 within the Hauraki Gulf Marine Park area have fluctuated. Commercial landings in those areas have varied between 119 and 338 tonnes per fishing year since the TACC was first set in 2004.

97 Most of the commercial catch of kahawai in New Zealand waters is taken by purse seining. However, there is currently a voluntary purse seine closure in place in the inner Hauraki Gulf and parts outside. No fishing has been reported by that fishing method within the inner Hauraki Gulf since before 1991.

98 There are two main groups of finfishing methods taking kahawai in the Hauraki Gulf Marine Park area. The first is trawling, Danish seining and long lining for snapper. Only very small catches of kahawai are taken as a bycatch of the snapper fishery, which is already constrained by method closures for trawling and Danish seining and a seasonal closure to long lining in some parts of the area.

99 The second is set netting and ring netting for grey mullet, flatfish, kahawai, snapper, trevally and rig. Commercial kahawai landings in the Gulf are primarily by set and ring net fishers, who fish for a small, but relatively valuable, local smoked fish trade. Smoked kahawai adds much greater economic value than that sold into other markets as frozen fillets or bait. Despite the set net fishery and ring net fishery being constrained by a prohibition on target fishing for certain species (including kahawai) during the summer months in the central part of statistical area 007, reported landings by these fishing methods have increased since 2004.

Annex Two

Customary fishing characteristics

100 Maori have had an historic interest in kahawai. Kahawai is an important food source in some localities. In some areas, kahawai is traditionally used in food dishes such as ika ota (raw fish) offered to visitors of marae. Exploitation of kahawai dates from the early settlement of New Zealand, when kahawai formed a substantial food source for Maori. In pre-European times, large catches were often dried or smoked and stored for later use. 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 (particularly in areas where there is some reliance on seafood such as kahawai as part of a staple diet). 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. Access to the kahawai resource to fulfil obligations such as manaakitanga (hospitality), as well as day-to-day food needs, is important for many Maori to be able to provide for their wellbeing.

Annex Three

Recreational harvest estimates – KAH 1

101 The first recreational harvest estimates were obtained from regional telephone diary surveys undertaken in 1991–92 in the South Region, 1992–93 in the Central Region and in 1993–94 in the North Region. National telephone diary surveys were undertaken in 1996 and 2000, with a follow up survey in 2001 (i.e., the 2000 and 2001 estimates are not independent). Combined aerial overflight / boat ramp surveys, focusing on snapper, have provided kahawai harvest estimates in 2004 (Hauraki Gulf only) and 2005 (FMA 1 only).

102 During 2004, the Recreational Technical Working Group (RTWG) indicated its concerns with telephone/diary surveys. The following summarises that group's views on the estimates:

"*The RTWG 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 harvest estimates are implausibly high for many important fisheries*."

103 Comments from stock assessment working groups (PELWG and NINSWG) went further than the RTWG and suggested that the 2000 and 2001 diary harvest estimates may be overestimated for kahawai stocks for those years - some PELWG members felt that the estimates were implausibly high - and are implausibly high if considered as a long term average; and likely represent the upper limit of the harvest that may have occurred in any year since the 1990s.

104 Concern has also been expressed about the aerial overflight estimate for KAH 1 being an underestimate because a large proportion of the catch is not directly assessed by this method (but other forms of harvest are allowed for in the final estimate).

105 One means of addressing these uncertainties was to consider KAH 1 harvest estimates relative to each other and to those for SNA 1. SNA 1 harvest estimates derived from the aerial overflight approach were considered to be broadly reliable. In 2004-05 the harvest of KAH 1 was estimated to be 22% of that from SNA 1. The ratio of KAH 1 to SNA 1 harvest estimates derived from previous diary harvest estimates averaged 37%, and 37% of the more accepted 2004-05 SNA 1 estimate (ie 37% of 2,419 tonnes) gives a KAH 1 harvest estimate of 892 tonnes.

106 The NINSWG reconsidered these issues in 2010 after further work benchmarking the KAH 1 estimates against SNA 1 - as described above - was undertaken. The working group concluded that the 800 tonnes estimate of KAH 1 recreational harvest derived from aerial surveys is more plausible than the estimate of 1,865 tonnes derived from the 2000 diary survey. The 800 tonnes estimate may not, however, be the best available estimate of the KAH 1 catch in 2004/05.

107 The various harvest estimates for kahawai are depicted in figure 3. The current recreational harvest is uncertain but MFish considers the most plausible estimates are in the vicinity of 500-900 tonnes.

Figure 3 Recreational harvest estimates for KAH 1 in relation to the 800 and 1865 recreational catch history scenarios. The dotted line is the reported commercial catch.