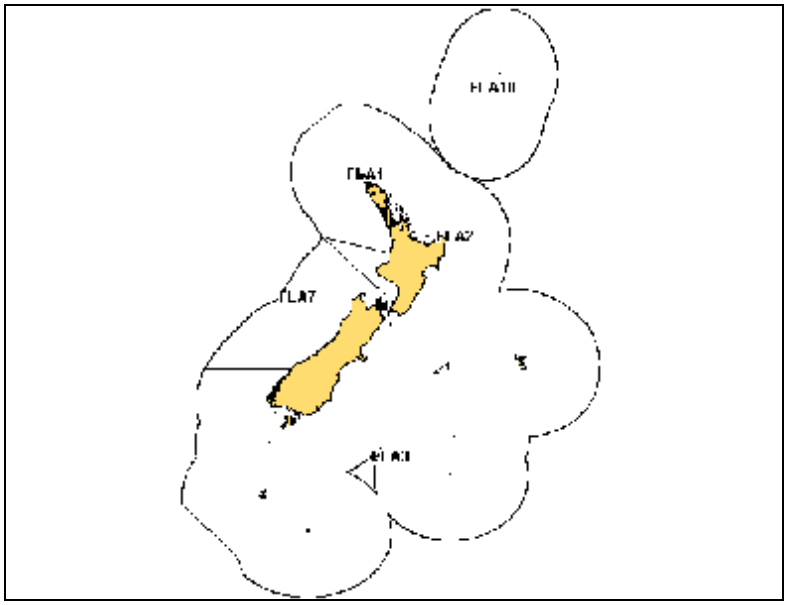
FLATFISH (FLA 1)

Figure 1: **Location of boundaries of the flatfish (FLA) Quota Management Areas.**



Key Issues to be Considered

1 The key issues to consider for flatfish (FLA 1) are as follows:

a) The Minister of Fisheries requested this review of catch limits for FLA 1, in response to expressions of concern from coastal communities (including some commercial fishers) about sustainability and local depletion of stocks in various harbours on the west coast of the North Island.

b) No total allowable catch (TAC) is currently set for FLA 1. The existing total allowable commercial catch (TACC) is 1 187 tonnes.

c) It is Ministry of Fisheries (MFish) policy when reviewing a stock to set a TAC if the stock does not yet have one.

d) There is some evidence of declining abundance and recruitment in FLA 1. The decline is considered unlikely to be caused by commercial fishing, but is nonetheless an important factor in determining an appropriate TAC.

e) If it were fully caught, the existing TACC is considered unlikely to move FLA 1 towards a level that could sustain the maximum sustainable yield (MSY).

f) Setting a TAC, and within that a TACC, will result in a reduction to the existing TACC. This reduction will have various social and economic impacts, even though the proposals retain a TACC at about the level of current catches.

List of Management Options

2 The following management measures are proposed for the FLA 1 fishery for the 2005–06 fishing year:

EITHER

Option 1

a) Set a TAC of 1 382 tonnes for FLA 1 and within that TAC set:

i) a customary allowance of 270 tonnes;

ii) a recreational allowance of 270 tonnes;

iii) an allowance of 27 tonnes for other sources of fishing-related mortality; and

iv) a TACC of 815 tonnes.

OR

Option 2

b) Set a TAC of 1 307 tonnes for FLA 1 and within that TAC set:

i) a customary allowance of 270 tonnes;

ii) a recreational allowance of 270 tonnes;

iii) an allowance of 27 tonnes for other sources of fishing-related mortality; and

iv) a TACC of 740 tonnes.

3 The current TACC is 1 187 tonnes. A TAC and other allowances have not yet been set for FLA 1. Both options propose to base the TAC, TACC, and allowances on recent catches.

4 The proposed TAC, TACC, and allowances are set out in Table 1.

Table 1: The proposed TAC (tonnes), TACC (tonnes) and allowances (tonnes) for FLA 1 for the 2005-06 fishing year

	Proposed TAC	Customary allowance	Recreational allowance	Other sources of fishing-related mortality	Proposed TACC
Option 1 (TAC based on recent catch)	1 382	270	270	27	815
Option 2 (TAC based on recent catch)	1 307	270	270	27	740

Rationale for Management Options

5 MFish proposes to set the TAC for FLA 1 using s 13 of the Fisheries Act 1996.

6 Most stocks in the Quota Management System (QMS) are managed under s 13. Section 14 provides an alternative means for setting a TAC under certain circumstances, where it would better meet the purpose of the Act. MFish considers that s 14 does not apply for FLA 1, because:

a) It is possible to estimate MSY because of the biological characteristics of the species;

b) A catch limit for New Zealand has not been determined as part of an international agreement;

c) The stock is not managed on a rotational or enhanced basis; and

d) The stock does not include one or more highly migratory species.

7 MFish considers it is possible to estimate MSY for flatfish. Although the 'FLA' code includes eight flatfish species, most of these are rarely taken in FLA 1. The two most common species in FLA 1 – yellow-belly and sand flounder – have similar life histories and other biological characteristics relevant to calculating MSY.

8 MSY is 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. Thus, relevant factors include the stock's population dynamics (for example, whether stock numbers vary greatly from year to year); and environmental factors that influence the stock. The level that can produce MSY may be a dynamic target rather than a fixed point.

9 The Minister of Fisheries must set a TAC under s 13 that:

a) Maintains the stock at, or above, a level that can produce MSY; or

b) Enables any stock that is currently below a level that can produce MSY to be restored to a level at, or above, that which can produce MSY; or

c) Enables the level of any stock currently above MSY to be altered in a way and at a rate that will result in the stock moving towards MSY.

10 Flatfish is also listed on the Second Schedule of the Fisheries Act 1996. This schedule can apply to any stock whose abundance may vary a lot from year to year. For stocks listed on the Second Schedule, in years when the stock is particularly abundant, the TAC can be increased *during* the fishing year. The aim of an in-season adjustment to the TAC is still to manage a stock at, or above, a level that can produce MSY.

Current stock status

11 A stock assessment has not been completed for FLA 1 that would provide information on whether the stock is at, above, or below the level that can produce MSY. However, there is some information to suggest that flatfish abundance may be declining, because of declining recruitment.

12 Analysis of the FLA 1 fishery indicates that commercial catch per unit effort has declined on both the west and east coast over the last fourteen years (Figure 2).[1] The decline is most evident in the Manukau Harbour, Kaipara Harbour, Firth of Thames, and Hauraki Gulf. These areas provide most of the flatfish catch (see Figure 6 in Annex One).

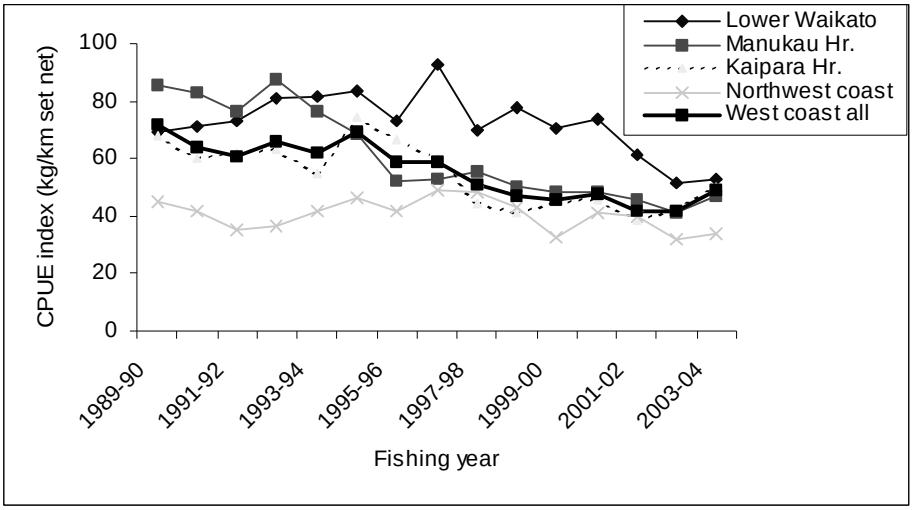
13 More than 90% of the west coast catch reported by species specific code is yellow-belly flounder (para 104 in Annex One). Catch per unit effort indices for the west coast, therefore, reflect abundance of yellow-belly flounder (rather than other FLA species that are less commonly caught).

14 In the Manukau Harbour, catch per unit effort declined at a moderate rate between 1989–90 and 1995–96. It then declined gradually to 2002–03, and subsequently increased slightly to 2003–04. In the Kaipara Harbour, catch per unit effort likewise declined at a moderate rate between 1989–90 and 1997–98. Catch per unit effort in the Kaipara Harbour appears to have been stable since 1997–98.

15 In the Firth of Thames, both yellow-belly and sand flounder are caught in significant quantities. The yellow-belly standardised catch per unit effort in the Firth of Thames declined steeply between 1990–91 and 1995–96, and has been fairly stable since then (see Figure 7 in Annex One). Catch per unit effort for sand flounder in the Firth of Thames increased between 1990–91 and 1993–94, but declined steeply to 2003–04 (see Figure 8 in Annex One).

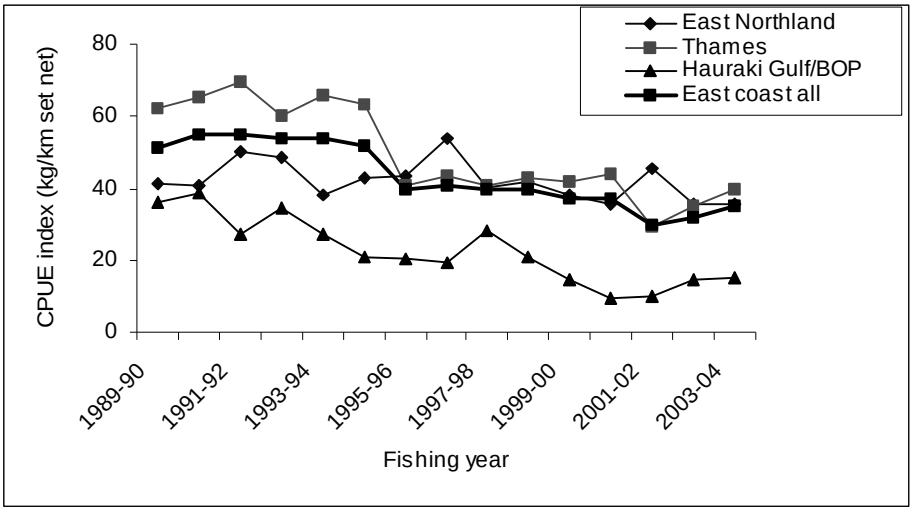
Figure 2: Standardised catch per unit effort indices by zone within FLA 1 for fishing years 1989–90 to 2003–04 (from Beentjes 2005).

a) West coast



[1] Catch per unit effort is often calculated as the catch weight (in kilograms) per metre of net used for set net fisheries such as flatfish. The length of time the net is in the water may also be a component of the catch per unit effort. A declining catch per unit effort means that more effort – metres of net set and/or length of soak time – is required to catch a given volume of flatfish.

b) East coast



16 Assessing the sustainability of FLA 1 catches using catch per unit effort analysis involves some assumptions about the relationship between the catch per unit effort indices and underlying flatfish abundance. It is generally assumed the relationship between catch per unit effort and abundance is proportional.[2] However, there are no other abundance indices for FLA 1 to evaluate whether the decline in catch per unit effort does index abundance. Although the catch per unit effort shows a decline, this is not reflected in the catch of FLA 1. Commercial catches have not decreased over time (although they have fluctuated markedly, and have never reached the TACC).

17 However, a decline is evident on both east and west coasts, and in all the main harbour fisheries. It is likely the FLA 1 fishery consists of a number of sub-stocks with limited mixing, particularly between the east and west coast. Tagging studies show that both sand flounder and yellow-belly flounder have a relatively small home range. The decline in various different fisheries indicates that abundance of flatfish may be declining throughout FLA 1.

18 Flatfish is a short-lived species, and the commercial fishery is likely to be based on only one or two year classes. Because the fishery is based on only one or two year classes, a trend of declining abundance (as indicated by the declining catch per unit effort) is equivalent to declining recruitment.

19 A number of factors may influence flatfish recruitment. The conclusion of the Inshore Working Group was that recruitment has declined in FLA 1. The decline may be caused by a number of factors, including environmental or climatic. Although the Working Group considered it unlikely that the size of the population was causing declining recruitment (because of a stock recruit relationship), that possibility cannot be ruled out.

20 Changes in fishing gear over time could also be influencing the apparently declining trend. The Working Group concluded that if these results were to be used as the basis of future management measures, the possible impact of gear changes on the abundance index should be investigated. For example, some fishers are voluntarily using nets with a larger mesh size,

[2] Dunn, A., Harley, S.J., Doonan, I.J. and Bull, B. (2000) Calculation and interpretation of catch-per-unit effort (CPUE) indices. *New Zealand Fisheries Assessment Report 2000/1*. 44 p.

which might decrease catch per unit effort. Conversely, net material of greater efficiency might now be in use that would increase catch per unit effort.

Assessment of Management Options

21 MFish policy is to set a TAC for any stock under review that does not yet have one. MFish considers that setting a TAC, and within it, allowances for commercial and non–commercial fishing, is the best way of ensuring sustainable management of this fishery.

22 MFish does not have information to confirm what is causing recruitment to decline. Rather than fishing pressure, the cause may be environmental or climatic factors. However, the TACC is currently set substantially above the level of commercial catches. Retaining the existing TACC is not considered a viable option, because a constant catch around the level of the TACC is unlikely to be sustainable. A TAC needs to be set that is more likely to fulfill the obligation to move FLA 1 towards the level that can produce MSY.

23 The following sources of information have been considered in proposing a TAC for FLA 1:

- Best available information about the status of the stock;
- The existing commercial catch limit set; and
- Catch information and estimates of other sources of fishing-related mortality.

24 Catch information and estimates of other sources of fishing-related mortality are considered the most appropriate basis for setting the TAC. Both option 1 and 2 sum the estimates of current catch and other sources of fishing-related mortality as the basis of the proposed TAC.

Stock status

25 Information about the status of the stock is discussed at paragraph 11. There are no existing estimates of sustainable yield. There is some information that recruitment has declined or is declining. This information cannot be used directly to determine a value for the TAC, but can be taken into account, along with other factors.

Existing catch limits

26 MFish considers the current TACC is a relevant factor to consider when determining *the way in which* and *the rate at which* a stock is altered to achieve the target stock level. However, the current TACC is not considered an appropriate input into setting the TAC under the Fisheries Act 1996, for the following reasons.

27 The original TACC for FLA 1 was set at a high level, based on 1983 catch levels that were the highest on record. The TACC was intended to allow high levels of commercial catch in years of high abundance.[3] However, the TACC has not been caught since it was set, and it is substantially above the level of current catches. The recent catch per unit effort analysis

[3] Colman, A. (1985) Flatfish. In: Background papers for the 1985 TAC recommendations. Pp 74-78. N.Z. Ministry of Agriculture and Fisheries (unpublished report held in NIWA library, Wellington).

also indicates that abundance has not shown the high variability from year to year initially anticipated for New Zealand flatfish species.

28 MFish recognises that commercial fishers are not obliged to fully catch their catch entitlements. Various reasons unrelated to abundance of the stock (for example market demand or price) can affect how much flatfish fishers choose to take. However, the existing TACC appears to be artificially high, given that it has never been caught. In addition, even if current commercial catches are not contributing to declining recruitment, MFish considers the possible decline in recruitment needs to be taken into account.

29 The 2004 plenary report noted that: "It is unknown if recent catch levels will allow the stocks to move towards a size that will support MSY."[4] MFish considers it unlikely that a TAC incorporating the current TACC of 1 187 tonnes (as well as allowances for recreational and customary catches) would move FLA 1 towards a level that would support MSY.

Other factors

30 MFish has also considered what impact fishing at the level proposed under the TAC will have on:

- Associated fisheries;
- Associated or dependent species;
- Maintenance of biological diversity of the aquatic environment; and
- Protection of habitat of particular significance for fisheries management.

31 MFish considers that none of these factors would require adjustment to the TAC proposals. Further information on these considerations is contained in the section on statutory considerations.

32 Yellow-belly and sand flounder have high fecundity, and are short lived. These characteristics are likely to increase the rate of rebuild towards the level that can produce MSY if it is currently below that level (see also Annex One). There is also uncertainty about whether current removals are likely to affect flatfish recruitment and abundance. For these reasons, it is not considered necessary to propose a TAC that is below the level of current catches at this stage. Nonetheless, it is desirable to constrain the potential for any additional effort and catch occurring in FLA 1, where recruitment may be declining. The impact of any reduction will be monitored, and further management action taken if required.

Proposed TAC options

33 Both option 1 and 2 propose to base the TAC for FLA 1 on current catches:

- Option 1 - TAC based on 15-year average of commercial catches, plus estimates of recreational and customary catches and other sources of fishing-related mortality;

[4] Annala, J.H., Sullivan, K.J., Smith, N.W.McL., Griffiths, M.H., Todd, P.R., Mace, P.M. and Connell, A.M. (Comps) (2004) Report from the Fishery Assessment Plenary, May 2004: stock assessments and yield estimates. 690 p.

- Option 2 - TAC based on 10-year average of commercial catches, plus estimates of recreational and customary catches and other sources of fishing-related mortality.

34 Estimates of current catch for the relevant sectors are discussed below.

Recreational catches

35 It is proposed that 270 tonnes be used as the estimate for recreational catch as an input for calculating the TAC. The same estimate is proposed for options 1 and 2.

36 Surveys of recreational fishing in 1992–94, 1996, 1999–00, and 2000–01 provide estimates of the recreational harvest of flatfish in FLA 1. The estimates from the 1999–2000 and 2000–01 surveys are very similar, and are considered the best available information about recreational take. Both surveys estimate recreational flatfish take in FLA 1 to be approximately 270 tonnes. Annex One contains further information on the recreational surveys.

37 The recreational survey estimates have relatively large ranges (203-336 tonnes in the 1999–00 survey and 189-352 tonnes in the 2000–01 survey). Therefore, MFish considers it is more appropriate to use the mid-point as an estimate of recreational catch, rather than an alternative value such as the upper limit of the harvest estimate.

Customary Maori catches

38 It is proposed that 270 tonnes be used as the estimate for customary Maori catch as an input for calculating the TAC. The same estimate is proposed for options 1 and 2.

39 There are no estimates of customary take of flatfish in FLA 1, but the species are known to be of importance to Maori (see paragraph 126, Annex One for details). Customary catches are, therefore, assumed to approximate the recreational catches for setting a TAC.

Estimate of other sources of fishing-related mortality

40 MFish proposes to include an estimate of 27 tonnes for other sources of fishing-related mortality for FLA 1. No allowance is currently set, but there are various potential sources of fishing-related mortality in FLA 1, including:

- Some fish are likely to escape from nets but subsequently die;
- Flatfish may be subject to high-grading, where market preference leads to the establishment of processor grading and size limits. Fishers may discard lower-grade fish that they are unable to sell;
- Some illegal catch of flatfish for commercial sale is likely to occur;
- Both commercial and recreational fishers may lose nets. Such ‘ghost nets’ can continue to catch fish for some time.

41 Because there is no quantitative information on other sources of fishing-related mortality, the proposed allowance is based on 2% of the estimated commercial and non-commercial take.

Commercial catches

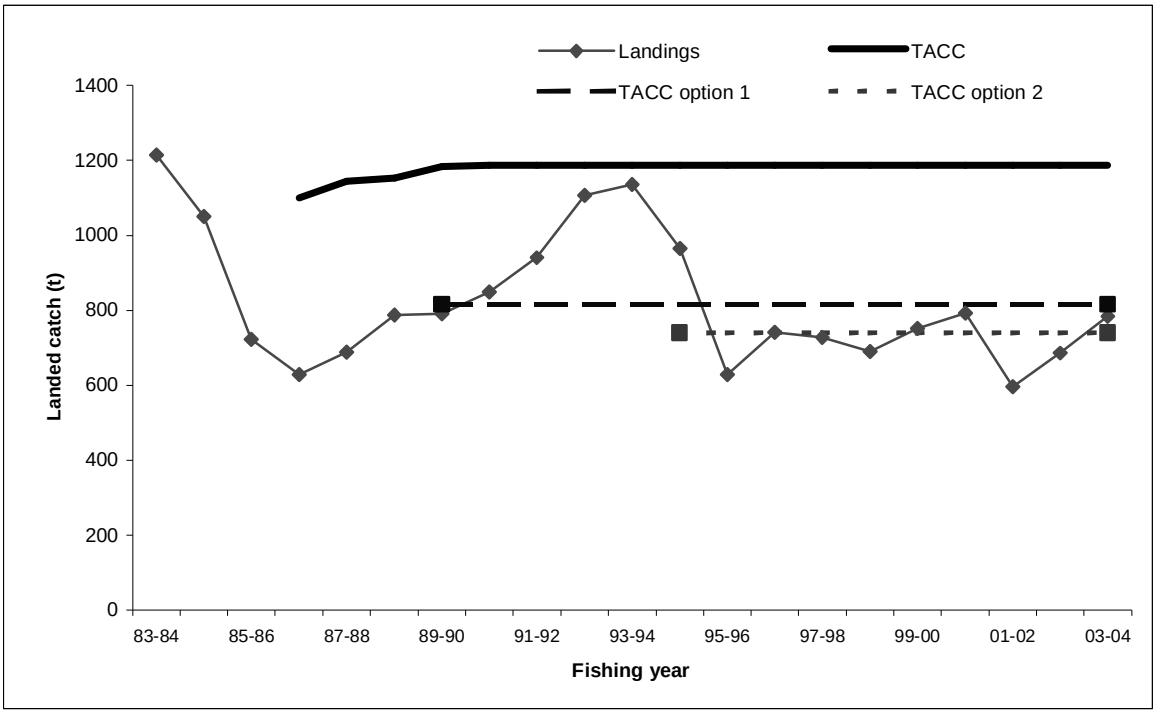
42 MFish assesses FLA 1 as a 'stable' fishery (rather than a developing fishery). Reported catches have remained relatively constant over an extended period, at around 600 to 700 tonnes. Peaks occurred in 1983–84 (1 215 tonnes), and 1993–94 (1 136 tonnes) (Figure 3).

43 The potentially high natural variability of flatfish has been taken into account by providing two options on which to base the TAC. Average landings have been rounded to the nearest 5 tonnes in both cases:

a) Option 1 - 15-year average of commercial catches (815 tonnes).

b) Option 2 - 10-year average of commercial catches (740 tonnes).

Figure 3: Landings, current TACC and proposed TACCs. Option 1: 15-year average of landings; option 2: 10-year average of landings.



Option 1

44 Option 1 proposes a TAC of 1 382 tonnes, including a commercial catch estimate of 815 tonnes. Commercial catch is averaged over a longer period in option 1, to account for any cyclical changes in flatfish catches over time. For example, commercial catches have peaked twice in the last twenty years: once in 1983–84, and again between 1992 and 1994. The fifteen-year period incorporates the years 1991–92 to 1994–95, in which flatfish catches were substantially higher than in other years.

45 The choice of periods longer than the flatfish lifecycle reflects the natural variability of flatfish, which is likely to have influenced commercial catches over shorter timeframes. Because of flatfish's biological characteristics (including high fecundity and short life span),

the risks to the stock of adopting the higher TAC as proposed in option 1 – and monitoring the impacts of that TAC – are not considered unduly high.

46 Option 1 would prevent any additional catch or effort in this fishery, where there is uncertainty about the biomass level that will produce MSY, and recruitment may have declined. Conversely, it would not necessarily constrain catches unduly.

Option 2

47 Option 2 proposes a TAC of 1 307 tonnes. This option proposes to use the same estimates for customary and recreational catch, and other sources of fishing-related mortality. It is proposed to calculate commercial catches over a different period – the 10-year average between 1994–95 and 2003–04 (740 tonnes).

48 Option 2 more closely reflects recent catches in the commercial fishery. In addition, using the more recent period may better reflect the apparent decline in flatfish abundance and recruitment.

49 Option 2 would prevent any additional catch or effort in FLA 1, as option 1 does. It is a more conservative approach that places greater emphasis on recent catches. The uncertainty about current recruitment may suggest that earlier catches are unrepresentative of what the fishery can now support. Option 2 places greater weight on anecdotal evidence from some coastal communities (including some commercial fishers) that current catches are unsustainable.

50 This TAC option is lower than past catches have been in some years, so is likely to have greater socio-economic impacts than option 1. Because most of the FLA 1 catch is targeted, fishers would probably be able to adjust their activities without necessarily exceeding the TAC. Option 2 would nonetheless have greater economic impacts than option 1. In particular, in some years the catch of fishers who might otherwise catch more than the proposed TAC would be constrained.

Allocation of the Total Allowable Catch

51 The proposed allowances and TACCs are outlined in Table 1.

52 It is proposed to determine allowances and TACCs based on each sector's current use of the fishery. FLA 1 is a valuable resource for both non-commercial and commercial fishers. Basing allowances on current use will result in a substantial reduction to the present TACC.

53 The Fisheries Act 1996 does not explicitly provide guidance about what level of allowance should be provided to sector groups. The Minister does have the discretion to reallocate from one sector to another. However, in shared fisheries where there is no clear information to support a 'utility based' model, MFish has a policy preference for allocating the TAC based on existing use.[5] The section on *Statutory obligations and policy guidelines* at the start of this document gives further information about allocation.

[5] A utility-based model is one in which allocation between sectors explicitly takes into account an assessment of the relative value of a fish stock to various sectors.

54 MFish has considered the following factors when proposing how to allocate the TAC:

- Existing catch levels and importance of the resource to each sector;
- Current fishing practices;
- Economic impact; and
- Social and cultural impact.

55 Any allocation decision will have a range of economic, social, and cultural impacts.

Economic impacts

56 FLA 1 has a relatively high commercial value, and a large number of fishers are involved in the fishery. The port price was set at $5.26 per kg in 2004. Conversely, FLA 1 quota trades at a low amount (generally $3-$5 per kg) compared to its market value.

57 Any reduction in the TACC will mean an 'opportunity cost' for commercial fishers, who will no longer be able to catch up to the current commercial catch limit. Because the TACC has never been caught, it is more meaningful to compare the opportunity cost between landings in the most recent fishing year (2003–04), and what they would be constrained to under the new TACC (**Error! Reference source not found.**2).

Table 2: Opportunity cost of decreases to the TACC (based on landings of 784 tonnes in 2003-04)

	Option 1 (815 t)	Option 2 (740 t)
Difference between proposed TACC and 2003-04 catch (tonnes)	+31	-44
Potential loss to commercial industry (based on 2004 port price)	N/A	$231,480

58 Because FLA 1 is listed on the Second Schedule, there is provision for an in-season increase to the TAC (under s 13(7)). This provision could potentially mitigate some of the lost opportunity costs, because catches could be increased during years of high abundance. However, using this provision would require a pre-recruit survey or some other way of assessing abundance, so it might not be a cost-effective way of increasing commercial catches.

59 Most of the FLA 1 commercial catch is taken by fishers who do not own quota, but buy annual catch entitlement (ACE) from quota holders. The market for ACE is quite active. Most quota holders who do not choose to fish their own entitlement sell it to other fishers (see Annex One for further information). If the commercial catch limit is reduced to the level of current catches, MFish expects that most commercial fishers will still be able to obtain ACE to cover their catches. This assumption is based on quota holders continuing to trade their ACE in a similar manner to their current practices.

60 However, because ACE will become scarcer, the price is likely to increase above the current level of $0.20-0.40 per kg. This increase is likely to affect the profitability of individual fishing operations. Conversely, quota holders may benefit over the medium term, because quota prices may increase.

61 MFish also notes that most flatfish is sold on the domestic market, where prices are likely to be affected by product availability. MFish is aware of anecdotal information that markets become saturated at certain times during the year, and fishers are advised to decrease landings for a time. Adjusting the TACC may result in a better product flow to domestic markets, and therefore more favourable prices.

62 Restricting the availability of ACE by reducing the TACC is also likely to limit the number of new fishers entering the fishery. MFish considers that existing fishers are more likely to be able to access ACE, because they will already have relationships with quota holders.

Social and cultural impacts

63 Flatfish is an important recreational fish species. It was amongst the top five finfish species harvested (by volume) in the most recent national survey of recreational fishing. Important recreational fisheries for yellow-belly and sand flounder occur in most estuaries, coastal lakes and coastal inlets throughout the North Island, including the west coast harbours; the lower Waikato; the Hauraki Gulf; the Firth of Thames; and Ohiwa and Tauranga Harbours. The main methods are set netting, drag netting, and spearing.

64 Flatfish is also a species of customary significance. Pātiki (flounder) have traditionally been a popular food source that can easily be caught by spear fishing. Customary design patterns based on the flounder shape have been related to hospitality, and being able to provide abundant food (see paragraph 126, Annex One).

65 The relatively high estimates of non-commercial catches indicate that recreational and customary fishers are still able to catch flatfish.

66 However, some recreational fishers have argued that commercial fishing affects the ability of non-commercial fishers to catch a 'fair' share of important recreational fisheries including flatfish. Non-commercial fishers cannot use the bulk harvesting methods that commercial fishers use. The high level of the current TACC, along with the lack of explicit allowances for non-commercial catch, may increase the likelihood that commercial fishers preferentially catch available flatfish. This situation is likely to be particularly apparent in years of lower flatfish abundance.

67 Community groups from several west coast harbours including Kaipara and Raglan have raised concerns about the extent of commercial fishing – including for flatfish – in harbours. These concerns relate not only to the overall sustainability of the fishstock. Other concerns include localised depletion, and competition for space when the extensive use of commercial fishing nets interferes with other harbour users. Non-commercial fishers in areas such as Kaipara, Manukau, and the Firth of Thames – where the main commercial fisheries are located – may find it hard to access flatfish.

68 Some commercial fishers are also involved in the Kaipara community group, and have raised their own concerns about the sustainability of the existing TACC.

Option 1

Customary Maori allowance

69 MFish proposes to make an allowance of 270 tonnes for customary Maori fishers, on the basis of estimated current catches.

70 The estimate of customary catch is very uncertain. MFish nonetheless considers that it is likely to be sufficient to allow Maori customary fishers to provide kaimoana (seafood) for important occasions, as provided for in the Fisheries (Kaimoana Customary Fishing) Regulations 1998 and Regulation 27 of the Fisheries (Amateur Fishing) Regulations 1986.

Recreational allowance

71 MFish proposes to make an allowance of 270 tonnes of recreational fishers, on the basis of estimated current catches. MFish recognises that, because of uncertainties in estimates of recreational catch, actual harvest could be either above or below 270 tonnes.

Allowance for other sources of fishing-related mortality

72 MFish proposes to set an allowance of 27 tonnes for other sources of fishing-related mortality, on the basis of estimated current incidental mortality.

TACC

73 MFish proposes to set the TACC at 815 tonnes under option 1.

74 If future commercial catches are of a similar size to recent catches, option 1 is unlikely to substantially affect commercial fishers' utilisation of the fishery. Figure 3 shows that commercial catches have exceeded the proposed TACC under option 1 only once in the last 10 years. As noted above, the decrease to the TACC is likely to nonetheless have economic impacts on commercial fishers. In particular, the availability and price of ACE may change.

75 The proposed TACC – at about the level of current catches – may mean that community concerns about sustainability are not fully addressed. However, MFish also notes that the Minister does not need to fully provide for the needs of any particular sector when specifying an allowance.

Option 2

76 Under option 2, MFish proposes to set a TACC of 740 tonnes – the 10-year average of commercial catches. This option is, therefore, likely to have a greater impact on commercial fishers. MFish proposes to set the same customary and recreational allowances, and allowance for other sources of fishing-related mortality in both options 1 and 2.

77 Because it is based on recent commercial catches, the TACC under option 2 is unlikely to substantially constrain commercial fishers in most years. However, the flatfish fishery is variable. Commercial catches have exceeded the TACC proposed under option 2 five times in the last 10 years (although sometimes by only a small amount). As **Error! Reference source not found.**2 shows, this option will have economic impacts in some years when the TACC will constrain catches to lower levels than have sometimes been obtained in recent years.

78 Furthermore, other factors such as environmental conditions are also likely to impact on the availability of flatfish. These factors will continue to affect flatfish abundance and recruitment at the TACC proposed under either option.

Other Management Controls

Deemed value

79 MFish considers it is not necessary to alter the existing deemed value at this stage. As **Error! Reference source not found.**10 in Annex One shows, the interim deemed value ($0.75) is currently set above the level of most ACE trades. Although reducing the TACC is likely to alter the cost of ACE, there is insufficient information at this stage to propose a change to the existing deemed value. A new policy framework is currently being developed that will provide further guidance on how to set deemed values.

Future Management

80 The proposed allocation of the new TAC under either option will reduce the current TACC. MFish requests feedback from stakeholders on the proposed options, but suggests that it may be appropriate to choose a smaller reduction at this stage. The fishery could be closely monitored to determine the social and economic results of the reduction, as well as the sustainability outcomes. Over the next several years, MFish proposes to monitor:

- The ongoing availability of ACE to enable current fishers to continue to fish;
- Quota and ACE prices;
- Quantity of deemed values paid; and
- Anecdotal evidence about the impact of any change implemented.

81 Because changes in fishing gear used over time could also cause the trend in catch per unit effort, MFish has commissioned research to investigate this factor. The results of this research should be available before the final advice paper is written.

82 Otherwise, no future research is currently planned to monitor FLA 1. Because recruitment and abundance in the largest commercial fisheries in FLA 1 appear to be declining, MFish considers that it would be useful to update the catch per unit effort analysis in two or three years. This research would be advanced through the research planning process that MFish regularly runs.

83 MFish will undertake further surveys to determine levels of recreational catch, including in FLA 1. Estimates of customary Maori catch may become available from reporting under the North Island customary fishing regulations. MFish would also welcome submitters providing further information on the social and customary importance of flatfish.

84 MFish notes that the Inshore Working Group has suggested that environmental factors such as siltation may be affecting flatfish recruitment. MFish does not have a direct role in managing such environmental impacts. Nonetheless, MFish will monitor existing work being done in this field, and may be able to advocate for future work.

Statutory Considerations

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

a) The purpose of the Act (as provided in s 8) is to provide for the use of fisheries resources while ensuring sustainability. Because information about flatfish abundance is uncertain, MFish has provided two options consistent with the Act's purpose. Both options aim to provide for use while ensuring sustainability. The options propose a TAC for sustainability purposes, and allowances for commercial, recreational and customary fishers to provide for use of the flatfish fishery.

b) The TAC set under s 13 should be set at the level that can produce MSY, or it should move the stock towards that level. As noted, there is uncertainty about where FLA 1 is in relation to the level that can produce MSY. Because of this uncertainty, two TAC options are proposed. MFish considers, on the information available, that both options are likely to move the stock towards the level that can produce MSY.

c) The proposed TAC options have also taken into account the following factors:

i) Flatfish stocks may vary from year to year, because they are affected by *environmental conditions*. However, specific environmental conditions have not been identified that would affect the movement of the stock towards a level that will support MSY (as discussed in s 13(2)(b)(ii) of the Act).

ii) The *biological* characteristics of flatfish have been considered when proposing options for the TAC (as required under s 13(2)(b)(ii)).

iii) Most flatfish is caught in target set net fisheries that catch only a small amount of bycatch. Small quantities of flatfish are caught as bycatch in other inshore fisheries. Section 13(2) notes that, when setting a TAC, the Minister shall have regard to the *interdependence of stocks*. There is no information to suggest that the interdependence of stocks should affect the level of the TAC set for FLA 1 at this time.

d) Social and economic consequences are a relevant factor when the Minister considers the way in which and rate at which a stock is moved towards or above a level that can produce MSY (s 13(3)). MFish has identified differing social and economic consequences of altering the TAC and TACC under each of the two options.

e) Natural variability is a relevant factor to consider when setting or altering a sustainability measure such as a TAC (s 11(1)(c)). This factor has been taken into account when choosing the periods over which to calculate average commercial catch.

f) Section 9 sets out some environmental principles that must be taken into account when setting or altering a sustainability measure such as a TAC:

a) Associated or dependent species should be maintained above a level that ensures their long-term viability;

b) Biological diversity of the aquatic environment should be maintained;

c) Habitat of particular significance for fisheries management should be protected.

g) The options proposed here are unlikely to lead to increased catches, or an expansion of fishing effort into previously unfished areas. Both options are therefore considered to adequately take into account these environmental principles).

h) Associated or dependent species (s 9a) are any non-harvested species – such as seabirds or marine mammals – that are affected by the taking of any harvested species. There have been instances on the North Island west coast where endangered Maui's dolphin have been caught in commercial and non-commercial set nets. To manage this risk, set netting has been prohibited within 4 nautical miles of much of the coast in fisheries management area 9, and within the entrance to the Manukau Harbour. There have been reports of Maui's dolphin sightings in some west coast harbours where set netting for flatfish occurs. However, at present there is insufficient evidence to confirm that the dolphins regularly come into the harbours. The proposed TAC options will not result in set net effort increasing in areas where Maui's dolphin may be found.

i) Protection of biological diversity of the aquatic environment also needs to be considered (s 9(b)). Likewise, s 9(c) concerns the protection of habitat of particular significance to fisheries management. Set netting is considered unlikely to impact on seabed habitat. However, the use of set nets can potentially impact on species diversity, because set nets may catch a wide range of inshore species. Many harbour areas where flatfish are targeted are important nurseries for a wide range of inshore species. There is no indication that set netting for flatfish adversely affects the value of the harbours as nurseries. Because no increase in fishing effort is anticipated, it is not expected that either of the proposed TAC options would have any additional impact on biological diversity or significant habitats.

j) A wide range of international obligations relate to fishing, including use and sustainability of fishstocks; and maintaining biodiversity (s 5(a)). MFish considers that the management options for FLA 1 are consistent with these international obligations.

k) MFish also considers that the proposed management options are consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5 (b)). Ongoing work is being done within the area covered by FLA 1 to promote policies that help to recognise customary use and management practices. This paper has assessed the importance of flatfish fisheries to customary fishers in FLA 1. Further information on this topic would also be welcomed.

l) Existing control measures have been considered when making recommendations for any change to measures used to control the FLA 1 fishery (as outlined in s 11(1)(b)). Annex One contains a list of specific controls.

m) No relevant fisheries plan has been approved under s 11(2A)(b) of the Act.

n) As discussed in Annex One, this paper has considered whether there are any relevant conservation services or fisheries services (as outlined in s 11(2A)(a and c)). No suggestion is made at this stage to alter any decision about whether such services are required. However, MFish does consider that some further research to update the catch per unit effort analysis for FLA 1 may be required in the future.

o) There are no known relevant provisions concerning the coastal marine area in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987 (as outlined in s 11(2)(a) and (b) of the Fisheries Act).

p) MFish considers that the proposals for FLA 1 meet the requirements of s 7 and 8 of the Hauraki Gulf Marine Park Act 2000 (which must be taken into account under s 11(2)(c) of the Fisheries Act). The Hauraki Gulf Marine Park Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf.

q) The nature of the fishery and the interests of each fishing sector have been considered in proposing the TACC and allowances for recreational and customary interests and other sources of fishing-related mortality (s 21(1)(a and b), 21(4)(i and ii) and 21(5)). There are currently no mātaitai within FLA 1. Areas have been closed for customary fishing purposes in FLA 1, but the closures do not affect flatfish fisheries. No restrictions have been placed on recreational fishing in any area within the QMA under s 311 of the Fisheries Act.

r) Section 10 sets out information principles that are to be taken into account when setting TACs.

s) The best available information on the status of FLA 1 is the revised research report that was presented to an Inshore Working Group meeting on 25 May 2005. This report provides a standardised catch per unit effort analysis of FLA 1. The report supplements information in the 2004 plenary. Based on the information contained in these reports, the Inshore Fisheries Assessment Working Group was unable to establish whether FLA 1 is above or below the level that can support MSY. MFish has, therefore, provided two options that place different weighting on information that indicates declining abundance in FLA 1.

t) MFish has used the surveys of recreational fishing in 1999–00, and 2000–01 as the basis for estimates of recreational catch in FLA 1. Limitations are acknowledged with the use of these surveys. However, in the absence of other information on recreational catches, the surveys are nonetheless considered to provide the best available information.

Conclusion

86 Commercial catch per unit effort information indicates that flatfish recruitment may be declining. Rather than fishing pressure, the cause may be environmental or climatic factors. In addition, the apparent decline may be caused by changes in gear use over time. However, the TACC is currently set substantially above the level of commercial catches. A TAC needs to be set that is more likely to fulfill the obligation to move FLA 1 towards the level that can produce MSY.

87 MFish considers it unlikely that a TAC incorporating the current TACC of 1 187 tonnes (as well as allowances for recreational and customary catches) would move FLA 1 towards a level that would support MSY.

88 The original TACC for FLA 1 was set at a high level, based on 1983 catch levels that were the highest on record. The TACC was intended to allow high levels of commercial catch in years of high abundance. Although MFish recognises that commercial fishers are not obliged to fully catch their catch entitlements, the existing TACC appears to be artificially high, given that it has never been caught. In addition, the recent analysis indicates that inter-annual abundance is not as variable as previously thought.

89 Option 1 and 2 both propose to base the TAC on estimates of current catches. The two options differ in the period over which they estimate commercial catches. Option 1

averages commercial catch over a longer period. This option makes greater provision for the natural variability of flatfish, and incorporates past years in which commercial catches have been higher than at present.

90 Conversely, option 2 chooses a shorter period to average commercial catches. Option 2 more closely reflects recent catches in the commercial fishery. Using the more recent period also makes more allowance for the apparent decline in flatfish abundance and recruitment. Commercial catches have exceeded the TACC proposed under option 2 in some years. Option 2 is a greater constraint on commercial fishers. Because FLA 1 is largely a target fishery, commercial fishers should nonetheless be able to constrain their catches within the TACC proposed under option 2.

91 Option 1 involves a greater risk to stock sustainability, given that the current stock status of FLA 1 is unknown. Option 2 would present a lower sustainability risk. However, because of flatfish's biological characteristics, the risks to the stock of adopting the higher TAC as proposed in option 1 – and monitoring the impacts of that TAC – are not considered unduly high.

92 Option 1 will also have a lower economic cost than option 2. Under option 1, commercial fishers are likely to be able to obtain ACE to cover their catches in most years, although the price may increase. Because both options are based on an estimate of current catches, neither may fully address community concerns about access to and sustainability of the fishery.

Preliminary Recommendations

93 MFish proposes that for the 2005–06 fishing year:

EITHER

Option 1

a) Set a TAC of 1 382 tonnes for FLA 1 and within that TAC set:

- i) a customary allowance of 270 tonnes;
- ii) a recreational allowance of 270 tonnes;
- iii) an allowance of 27 tonnes for other sources of fishing-related mortality; and
- iv) a TACC of 815 tonnes.

OR

Option 2

b) Set a TAC of 1 307 tonnes for FLA 1 and within that TAC set:

- i) a customary allowance of 270 tonnes;
- ii) a recreational allowance of 270 tonnes;
- iii) an allowance of 27 tonnes for other sources of fishing-related mortality; and
- iv) a TACC of 740 tonnes.

ANNEX ONE

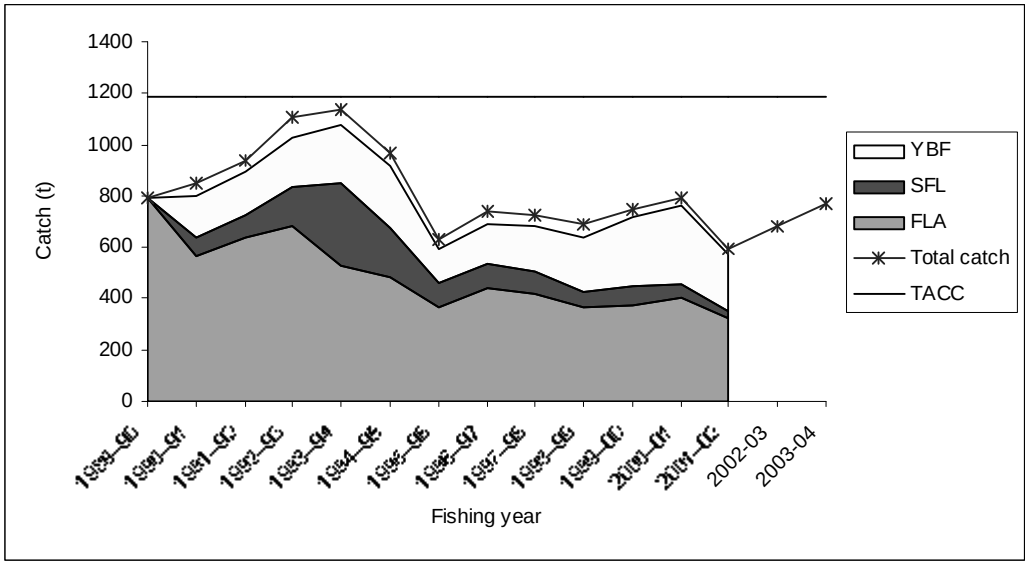
Fishery Information

Biological Characteristics

94 Flatfish feed on benthic macrofauna such as small crabs, worms, and small shellfish. They are a food source for a variety of fish and bird species (Paul 2000).

95 The species most commonly caught in FLA 1 are yellow-belly and sand flounder (Figure 4). Flatfish quota provides for the landing of eight species of flatfish: yellow-belly flounder, *Rhombosolea leporina*; sand flounder, *Rhombosolea plebeia*; black flounder, *Rhombosolea retiaria*; greenback flounder, *Rhombosolea tapirina*; lemon sole, *Pelotretis flavilatus*; New Zealand sole, *Peltorhamphus novaezeelandiae*; brill, *Colistium guntheri*; and turbot, *Colistium nudipinnis*. For management purposes, landings of all these species are recorded using the generic code FLA.

Figure 4: **Estimated commercial catch of yellow-belly flounder (YBF), sand flounder (SFL) and FLA in FLA 1 between 1989-90 and 2001-02 from all methods, scaled to landed catch. Total landed catch and the TACC in FLA 1 between 1989-90 and 2003-04 are also shown. (Source: Beentjes 2005, using data from Beentjes 2003).**



Productivity and natural variability

96 The New Zealand flatfish species that have been studied are fast growing and mainly short–lived. They generally only survive to three to five years of age. Very few reach five to six years. Flatfish generally mature at two or three years, when they are about 23-25 cm long (Colman 1994). A recent study has indicated that brill and turbot are longer lived, reaching a maximum age of 21 years and 16 years respectively (Stevens *et al*. 2001).

97 Size limits (for most species at 25 cm; 23cm for sand flounder) are generally at or above the size at which the fish reach maturity. The size limits are considered to provide adequate

protection to juveniles (Annala *et al*. 2004). Yellow-belly flounder have an average length of 25-40 cm, reaching at least 45cm. Sand flounder are also thought to reach about 45cm, with an average length of 25-35cm (Paul 2000).

98 Adult mortality is high. Consequently, many flatfish spawn only once and few spawn more than two or three times. However, fecundity is also relatively high, e.g., from 0.2 million eggs to over 1 million eggs in sand flounders (Annala *et al*. 2004). Because adult populations generally consist of only one or two year classes at any time, population size depends heavily on the strength of the recruiting year class. Recruitment of juvenile flatfish to the adult stock is variable from year to year. Flatfish populations are thus variable from year to year.

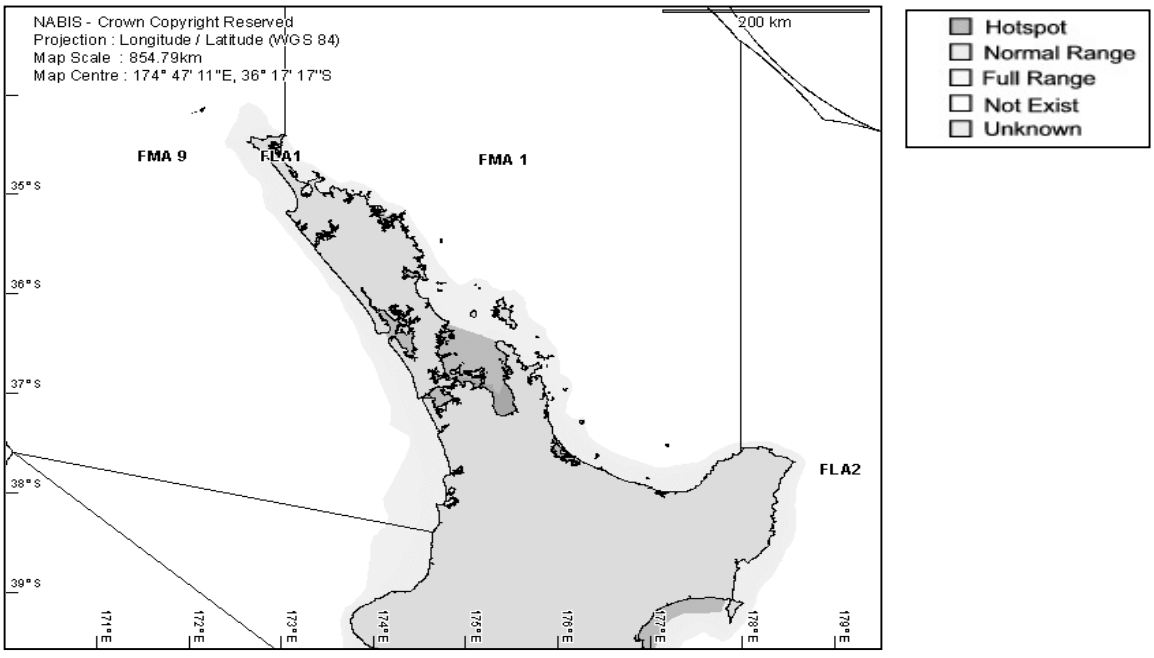
Distribution

99 Yellow-belly flounder are widespread, particularly in the northern North Island. They are shallow-water fish, sometimes found along open sandy coasts out to about 50 m. They are much more abundant in harbours, estuaries, and muddy bays (Paul 2000). Sand flounder occur in shallow but more open water than do yellow-bellies, but also range into harbours and estuaries (*ibid.*) (Figure 5).

100 Juveniles congregate in sheltered inshore waters, e.g., estuarine areas, shallow mudflats and sandflats, where they remain for up to two years. Flatfish move offshore during winter and spring for first spawning at two to three years of age.

101 There is evidence stocks are fairly localised, although how neighbouring populations inter–relate has not been thoroughly studied. Some studies indicate that flounder can move substantial distances. Other tagging studies, including one in the Hauraki Gulf, demonstrate very little movement. Flatfish in enclosed waters such as the Hauraki Gulf may be effectively isolated from neighbouring populations, and could be considered as separate stocks. Flatfish in the Bay of Plenty may likewise be treated as a separate stock (Annala *et al*. 2004). However, eggs may move considerable distances in the water column.

Figure 5: Distribution of yellow-belly and sand flounder in FLA 1



Catch Information

Commercial fishery

102 Annual flatfish catches for FLA 1 in recent years have been between about 600 and 700 tonnes, but historically have varied two-fold. Peaks of 1 215 tonnes and 1 136 tonnes occurred in 1983–84 and 1993–94 respectively (Table 3; Figure 3).

Table 3: Reported landings (t) of flatfish by fishstock from 1983-84 to 2002-03 and actual TACCs (t) from 1986-87 to 2003-04

Fishstock	FLA 1		FLA 2		FLA 3		FLA 7		FLA 10			
FMA (s)	1 & 9		2 & 8		3, 4, 5 & 6		7		10		Total	
	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings§	TACC
1983–84*	1215	–	378	–	1 564	–	1486	–	0	–	5 160	–
1984–85*	1050	–	285	–	1 803	–	951	–	0	–	4 467	–
1985–86*	722	–	261	–	1 537	–	385	–	0	–	3 215 ‡	–
1986–87†	629	1 100	323	670	1 235	2 430	563	1 840	0	10	2 750 ‡	6 050
1987–88†	688	1 145	374	677	2 010	2 535	1 000	1 899	0	10	4 072 ‡	6 266
1988–89†	787	1 153	297	717	2 458	2 552	757	2 045	0	10	4 299	6 477
1989–90†	791	1 184	308	723	1 637	2 585	745	2 066	0	10	3 482	6 568
1990–91†	849	1 187	292	726	1 340	2 681	502	2 066	0	10	2 983	6 670
1991–92†	940	1 187	288	726	1 229	2 681	745	2 066	0	10	3 202	6 670
1992–93†	1106	1 187	460	726	1 954	2 681	1 566	2 066	0	10	5 086	6 670
1993–94†	1136	1 187	435	726	1 926	2 681	1 108	2 066	0	10	4 605	6 670
1994–95†	964	1 187	543	726	1 966	2 681	1 107	2 066	0	10	4 580	6 670
1995–96†	628	1 187	481	726	2 298	2 681	1 163	2 066	1	10	4 571	6 670
1996–97†	741	1 187	363	726	2 573	2 681	1 117	2 066	0	10	4 794	6 670
1997–98†	728	1 187	559	726	2 351	2 681	1 020	2 066	0	10	4 657	6 670
1998–99†	690	1 187	274	726	1 882	2 681	868	2 066	0	10	3 714	6 670
1999–00†	751	1 187	212	726	1 583	2 681	417	2 066	0	10	2 963	6 670
2000–01†	792	1 187	186	726	1 702	2 681	447	2 066	0	10	3 127	6 670
2001–02†	596	1 187	177	726	1 693	2 681	614	2 066	0	10	3 080	6 670
2002–03†	686	1 187	144	726	1 650	2 681	819	2 066	0	10	3 299	6 670
2003–04†	784	1 187	218	726	1 282	2 681	917	2 066	0	10	3 201	6 670

* FSU data.
† QMS data.
§ Includes landings from unknown areas before 1986–87.

103 Much of the catch in FLA 1 is targeted (between 85% and 97%). Around 95% of targeted FLA 1 landings are taken by set net, 3% are taken by bottom trawl and less than 1% by Danish seine. The limited amount of trawling occurs on the open coast and Firth of Thames, and Danish seining almost exclusively in Hauraki Gulf and Bay of Plenty. Peak catches in the set net fishery occur in summer and autumn for Manukau and Kaipara Harbours, and spring and summer for Firth of Thames.

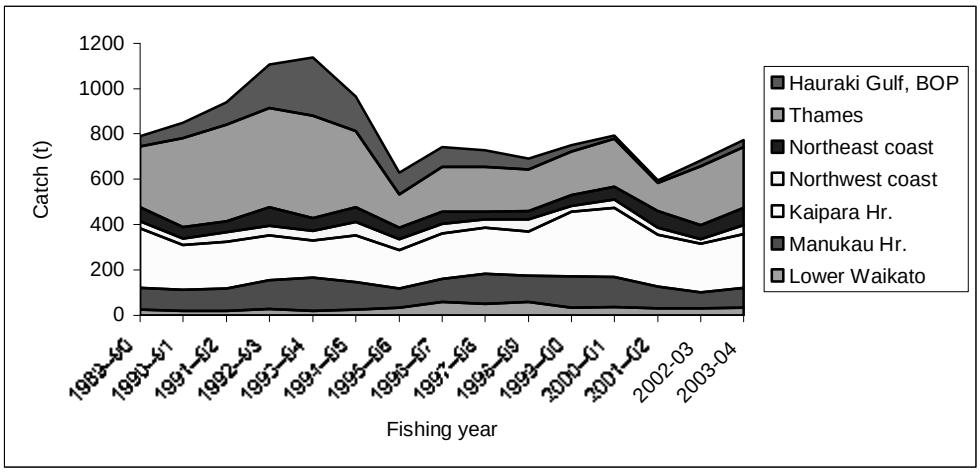
104 Fishermen and processors often record catches using a generic flatfish (FLA) code rather than using the individual species codes. Between 1989–90 and 2001–02, 59% of the estimated catch in FLA 1 was recorded using the generic code FLA, and the remainder used a combination of 11 other species codes (Beentjes 2003). Yellow-belly flounder (YBF) comprised 23% of the reported estimated catch, and sand flounder (SFL), 13% (Figure 4).

105 The use of 'FLA' as a reporting code has declined over time, so it is difficult to interpret trends in species catch. Although there does not appear to be a trend in total flatfish catch from FLA 1, catch of sand flounder has been steadily declining since the peak in 1993–94.

106 Thames, Kaipara Harbour, and Manukau Harbour provide much of the FLA 1 catch. Catches from the Hauraki Gulf and Bay of Plenty have been low in recent years, but were significant prior to 1999–2000 (Figure 6).

107 Vessels less than 10 m in length take around 90% of the FLA 1 catch; vessels of 10-20 m take much of the remainder. In the 2003–04 fishing year, 269 vessels were involved in the fishery, 188 of them in the 0-10 m class.

Figure 6: FLA 1 total estimated commercial catch from all methods, by area, for fishing years 1989-90 to 2003-04, scaled to landed catch (Beentjes 2005).



Associated fisheries

108 FLA 1 fisheries are relatively targeted, and do not catch substantial quantities of bycatch. Bycatch species include kahawai, red gurnard, parore, snapper, rig, john dory, and grey mullet. All of these species are managed under the quota management system, with their own catch limits in place. The catches in the flatfish fishery do not constitute a substantial portion of total landings for most of these species. As much as 20% of parore landings are taken in association with flatfish. Altering the TACC for FLA 1 is considered unlikely to substantially affect these associated fisheries.

109 Relatively small amounts of flatfish are caught in a range of inshore fisheries, including for snapper, rig, red gurnard, john dory and grey mullet. Estimated catches of FLA 1 caught as bycatch ranged from around 12 to 20 tonnes between 1998–99 and 2002–03.

Recreational fishery

110 Table 4 shows harvest estimates from the relevant recreational surveys.[6] Surveys were carried out in the North region in 1993-94 (Teirney *et al.* 1997), and nationally in 1996 (Bradford 1998); 1999–00 (Boyd and Reilly 2002); and a roll-over survey in 2000–01 (Boyd *et al.* 2004).

111 The midpoint of the estimate in the 1993–94 survey (250 tonnes) is similar to the 1999–2000 and 2000–01 survey estimates of 270 tonnes. Only the 1996 survey gives a

[6] In December 2003, technical members of the Recreational Working Group (RWG) examined the methodologies used for the 1996, 1999-00 and 2000-01 surveys. The RWG considered that the 1996 results should not be used as absolute estimates of recreational catch, because the results were considered to be substantially under-estimated. More recently, the 1996 estimates are reported to contain methodological errors and are considered unreliable. Technical members of the RWG have advised more recently 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.

lower estimate (110 tonnes). MFish notes that this survey has methodological errors. Although the estimates of the other surveys are also uncertain, they are considered more reliable than that of the 1996 survey.

Table 4: Estimated number and weight of flatfish harvested by recreational fishers. (- Data not available).

Date	Survey	Number	c. v.%	Harvest range (t)	Point estimate (t)
1993-94	North	520 000	19	225-275	-
1996	National	308 000	11	95-125	110
1999-00	National	702 000	25	203-336	-
2000-01	National	704 000	30	189-352	-

Maori customary fisheries

112 No quantitative information is available on the current level of Maori take for customary purposes for FLA 1, although flounder is known to be of customary importance (see paragraph 126).

113 Customary take is considered to probably be similar to recreational catch levels. The flatfish species are readily accessible for customary fishers, and there is a history of customary use.

Illegal catch

114 Quantitative information on the level of illegal catch is not available.

Other sources of fishing-related mortality

115 Quantitative information on the level of other sources of fishing-related mortality is not available. It is likely that some fish will escape from nets but subsequently die. Flatfish may also be subject to high-grading, where market preference leads to the establishment of processor grading and size limits. Fishers may discard lower-grade fish, even though they are above the minimum legal size limit. The extent of this unrecorded fishing mortality is unknown. Incidental mortality during recreational or customary fishing is considered minimal.

Stock Assessment Information

116 The recent review of standardised catch per unit effort for FLA 1 analysed various sub-regions within FLA 1-E and 1-W, as follows:

a) FLA 1-west:

i) Lower Waikato (statistical areas 041 and 042);

ii) Manukau (statistical area 043);

iii) Kaipara (statistical area 044);

iv) Northwest coast (statistical areas 045-047).

b) FLA 1-east:

i) East Northland (statistical areas 002-003);

ii) Thames (statistical area 007);

iii) Hauraki Gulf/Bay of Plenty (statistical areas 005-006, 008-010).

117 Major fisheries occur in the main harbours. Catches from the coastal areas are far lower. There is a seasonal pattern of effort in the main harbour fisheries of Kaipara, Manukau and the Firth of Thames, where greater effort occurs over the warmer months. The coastal fisheries showed in general a minor seasonal effect.

118 Revised analyses presented on 25 May 2005 used different criteria to select core vessels to include in the analysis, and a different data selection model. Neither change substantially altered the results that were presented at a Working Group meeting on 28 April 2005. Figure 2 presents the data from the earlier analysis (presented on 28 April 2005), because the subsequent analysis examined only the major fisheries.

119 Standardised catch rates have trended down in the major harbour fisheries, but the coastal fisheries are more mixed (Figure 2). Most coastal fisheries showed little trend. The declining trend is supported by a recent characterisation study of major fisheries in the Kaipara Harbour (Hartill 2002). Catch rates of flatfish in the Kaipara peaked in the 1990s and then declined, indicating local depletion within the harbour. There were also indications that increasing effort in the Kaipara harbour placed added stress on the fishery. The catch per unit effort analysis was unstandardised.

120 Further data on the catch composition of the various sub-areas was also presented on 25 May 2005. Yellow-belly flounder were shown to dominate catches in most areas. Catches of sand flounder were substantial only in the Firth of Thames (statistical area 007). A separate analysis of yellow-belly and sand flounder catch per unit effort was therefore done for the Firth of Thames, but not for other sub-areas.

121 Catch per unit effort trends were different for yellow-belly and sand flounder in the Firth of Thames (Figure 7, Figure 8). Although both indices show the declines that were seen in other areas, the decline is more marked for sand flounder, because abundance peaked strongly in 1994–95. The strong recruitment of sand flounder in the mid 1990s may be linked to colder than average sea temperatures in the early 1990s. However, no relationship between recruitment success and sea temperature was evident for yellow-belly flounder.

Figure 7: Catch per unit effort for yellow-belly flounder, Firth of Thames (007) between 1990-91 and 2003-04

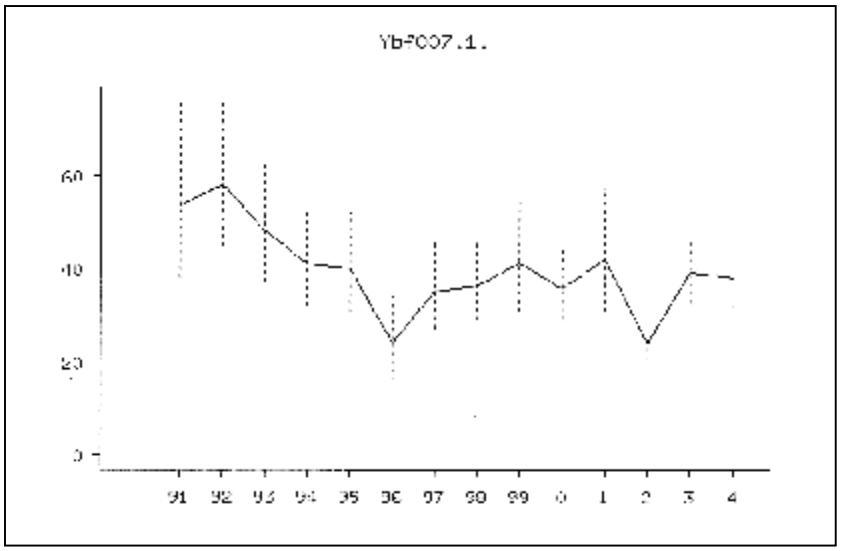
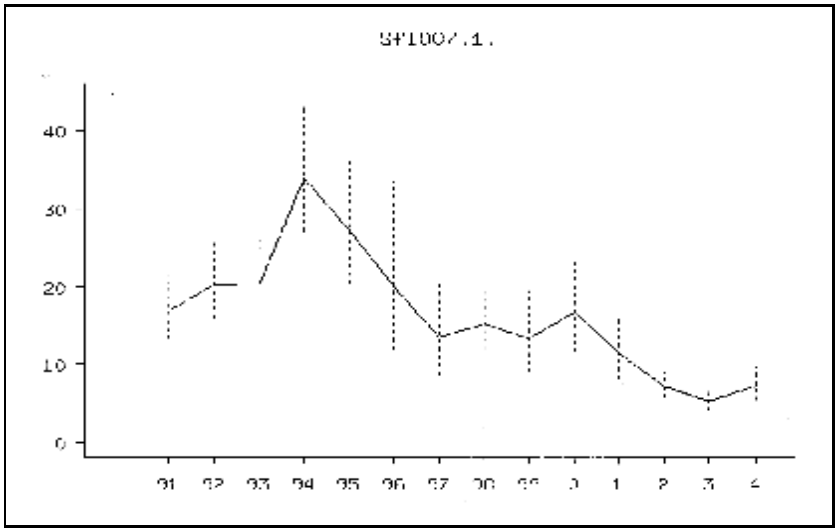


Figure 8: Catch per unit effort for sand flounder, Firth of Thames (007) between 1990-91 and 2003-04



Impacts of fishing

122 No research has yet been conducted on the catch of seabirds in flatfish set net fisheries. However, the *National Plan of Action to Reduce the Incidental Catch of Seabirds in New Zealand Fisheries* (April 2004) does not list flatfish as one of the fisheries with seabird interactions of particular concern. Because the options proposed here are unlikely to lead to increased catches, or an expansion of fishing effort into previously unfished areas, it is unlikely there would be a significant increase in the adverse effects on associated or dependent species.

123 Flatfish set net fisheries could potentially represent a risk to the endangered west coast North Island Maui's dolphin. Some of these dolphins have been accidentally caught and killed in set nets. Consequently, all set net fishing is prohibited in areas known to be the habitat of these dolphins. Research is currently being done to determine whether Maui's dolphin range includes parts of west coast harbours where there is a high level of set netting

for flatfish. However, the TAC proposals will limit any future increase in set netting for flatfish and therefore do not increase any risks to the dolphins.

124 Biological diversity of the aquatic environment has been considered when assessing consequences of the proposed options. The use of set nets can potentially impact on species diversity. Many harbour areas where flatfish are targeted are important nurseries for a wide range of inshore species. Juveniles of various species may be caught in set nets. The minimum mesh size limit is considered to provide some protection. Because no increase in fishing effort is anticipated, it is not expected that any of the proposed TACs would have any additional impact on biological diversity. Set netting is also considered unlikely to impact on seabed habitat.

Existing controls

125 Existing controls on flatfish fishing include area closures, method restrictions in certain areas, a minimum legal size and minimum set net mesh size, soakage time limits, and an amateur daily bag limit, as outlined below:

- Various areas are closed to the taking of finfish;[7]
- Set netting is prohibited in certain waters;[8]
- Inside specified harbour waters, no commercial fisher may use in total more than 1 000 m in any combination of net lengths;[9]
- There are restrictions on net fishing in the Bay of Islands;[10] and net and longline fishing around Mayor (Tuhua) Island;[11]
- Trawling and Danish seining are prohibited in defined areas;[12]
- There are restrictions on commercial fishing in the Manukau Harbour at certain times of day;[13] and restrictions on amateur fishing at all times;[14]
- There are seasonal restrictions on fishing methods for flatfish in the Inner Hauraki Gulf from 1 October to 31 March;[15]
- Stalling is not permitted,[16] except in the Kaipara Harbour;[17]
- Commercial fishers must service their nets within 18 hours;[18]
- The minimum mesh size for flatfish is 114mm in the Auckland and Kermadec fisheries management areas;[19]

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[7] Regulations 19, 23, 23(5) of the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[8] Regulation 15A, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[9] Regulation 10A, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[10] Regulation 19A, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[11] Regulation1 18AA, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[12] Regulation 3, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986; and Regulation 4, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[13] Regulation 18, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[14] Regulation 4, Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986.
[15] Regulation 4F, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[16] Regulation 61, Fisheries (Commercial Fishing) Regulations 2001.
[17] Regulation 14, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986.
[18] Regulation 66, Fisheries (Commercial Fishing) Regulations 2001.
[19] Regulation 5F, Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986; Regulation 3B, Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986.

- Flatfish is one of the species included in the daily combined bag limit of twenty fish that recreational fishers in Auckland and Kermadec fisheries management areas may take;[20]
- Amateur set netting is prohibited in defined areas;[21] and restricted in parts of the Bay of Islands;[22]
- Various controls apply to amateur net fishing, including a limit of one net per person; nets to be hauled by hand; nets not to extend across more than one-quarter of the width of any channel; net not to exceed 60 m in length; nor be set within 60 m of another net; stranding is not allowed;
- All fishing is prohibited in marine reserves at the Poor Knights Islands; Cape Rodney-Okakari Point; Long Bay-Okura; Pollen Island (Motu Manawa); Cathedral Cove (Whanganui-a-Hei); Mayor Island (1060 ha); and Te Matuku Bay.

Social, Cultural and Economic Factors

Customary importance

126 There is limited information about the social and cultural significance or importance of flatfish to customary fishers. However, being able to provide fish for special occasions is important for ***manaakitanga*** (hospitality), particularly in harbours on the west coast and in the far north.

127 Pātiki (flounder) have traditionally been a popular food source, since they can easily be caught by spear fishing. Submissions to the Waitangi Tribunal during the hearing of the Muriwhenua fishing claim (Wai 22) in 1988 noted that "Floundering was an everyday past–time for us children."[23]

128 Flounder are the inspiration for the pātiki or pātikitiki designs of some tukutuku panels (the woven panels that adorn meeting houses). The pattern is based on flounder's lozenge or diamond shape. The pātikitiki pattern has been related to hospitality, and being able to provide abundant food for the whole iwi.

129 Flounder are amongst the species listed in a Protocol between Te Uri o Hau and the Ministry of Fisheries, covering a large portion of the Kaipara Harbour. The Protocol was established as part of a Deed of Settlement. It recognises Te Uri o Hau's interest in all species of fish, aquatic life, and seaweed within the Te Uri o Hau Fisheries Protocol area.

Spatial tools applied in FLA 1

130 Tangata kaitiaki have been appointed in several areas within FLA 1. Tangata kaitiaki can issue permits for Maori customary fishing purposes. In the Tauranga Moana area (Tauranga), 55 have been appointed. Eight kaitiaki have been appointed at Raukokere in the Bay of Plenty, and eleven in Aotea Harbour on the West Coast. A mataitai application has been submitted at Raukokore, Bay of Plenty (Te Whanau Maru-haere-muri).

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[20] Regulation 3A, Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986.
[21] Regulation 6C, Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986.
[22] Regulation 6B, Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986.
[23] Wiremu Paraone, doc B33, in 'Report of the Waitangi Tribunal on the Muriwhenua fishing claim (Wai 22) 1988' (pg 28).

131 There are taiapure at Waikare Inlet and Maketu on the east coast, and Kawhia-Aotea on the west coast. The Kawhia-Aotea taiapure includes the Kawhia and Aotea Harbours and 1nm around Gannet Island (approximately 137km). There is also a taiapure application for Manukau Harbour, which includes the entire harbour inside Manukau Heads.

Social importance

132 Flounder species are relatively accessible for non-commercial fishers to catch, using spears or nets. Flounder are likely to be an important food source in some communities. The recreational harvest estimates indicate that flounder is a popular recreational species, with harvests in the order of 40-50% of commercial catches.

Economic importance

133 Recent port prices for FLA 1 are shown in Table 5. National exports of flounder species are around 800 tonnes a year, with a value of $6 million in 2004 (**Error! Reference source not found.**6). Flounder is also commonly sold on the domestic market. Landings from FLA 1 are around 20% of national landings.

Table 5: Port price for FLA 1 ($/kg)

	2002	2003	2004	2005*
FLA 1	4.5675	4.75	5.2609	3.35

* Provisional figure only: proposed 2005/06 port price

Table 6: National exports of flounder in 2003 and 2004. FLA 1 accounts for approximately 20% of national landings.

Flounder exports	2003		2004	
Type	Volume (kg)	Value ($)	Volume (kg)	Value ($)
Chilled fillets	1 908	14 672	97	802
Chilled headed and gutted	68 370	542 916	14 044	126 448
Chilled other form	386	4 079	90 857	747 316
Chilled whole	368 470	2 989 939	303 122	2 458 467
Frozen fillets	140 312	1 745 529	22 650	168 456
Frozen headed and gutted	8 750	64 499	13 000	90 188
Frozen other form	48 350	216 649	63 080	416 144
Frozen whole	253 788	1 667 718	300 634	1 979 998
Total	890 334	$7 246 001	807 484	$5 987 819

134 FLA 1 quota shares have generally traded for between $3 and $5 per kg over the last four years (**Error! Reference source not found.**9). ACE prices have commonly been in the range $0.20 to $0.40 (**Error! Reference source not found.**10).

Figure 9: Quota trade prices ($ per kg) for FLA 1 (1 October 2001 – 30 April 2005)

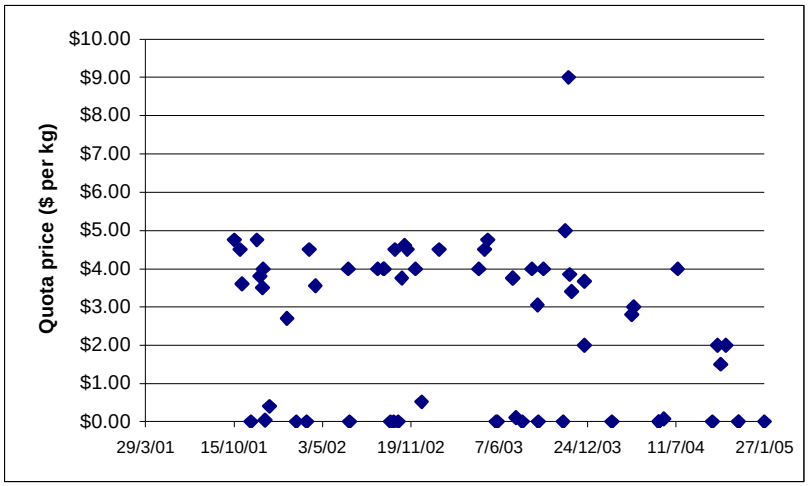
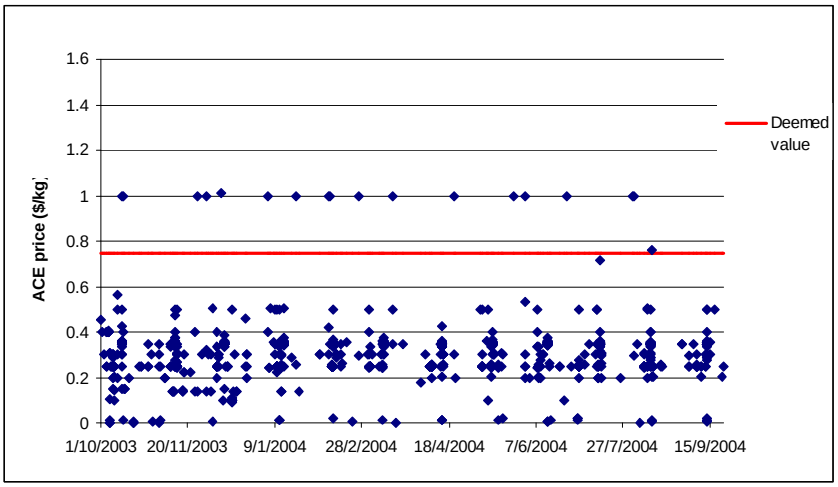


Figure 10: ACE trade prices ($ per kg) and interim deemed value for FLA 1 (2003-04)



135 The available ACE trading data suggests that there is an active market, with ACE available for most fishers to cover their catches. In the 2003–04 fishing year, 40% of quota was held by quota holders who sold 100% of their ACE. Only four quota holders, accounting for 2.9% of quota, did not sell any of their quota.

136 Figure 11 shows that by the end of the 2003–04 fishing year, most major quota holders had sold their ACE to other fishers. Conversely, Figure 12 shows that many of the fishers with the largest ACE holdings at the end of the 2003–04 fishing year did not own quota shares.

137 The relatively low amounts paid in deemed values also suggest that ACE are readily available (Table 7). The interim deemed value is set above the level of most ACE sales (see **Error! Reference source not found.**10). The annual deemed value is set at $1.50.

Table 7: Deemed value payments in FLA 1, 2001-02 to 2004-05

Year	Deemed value payment
2001-02	$6,313
2002-03	$3,485
2003-04	$4,667
2004-05*	$3,596

* fishing year incomplete.

138 There are 146 quota holders in FLA 1 (as at 10 June 2005). Quota is generally held in small parcels. The maximum holding is 118 tonnes (10% of the TACC). Only one other quota holding is greater than 5% of the TACC. There were 277 holders of ACE during the 2003–04 fishing year.

Figure 11: Quota holdings of top 30 quota holders in FLA 1 for the 2003-04 fishing year, and end of year regular ACE held by each quota holder. Where the quota and ACE values are not the same, ACE trading has occurred.

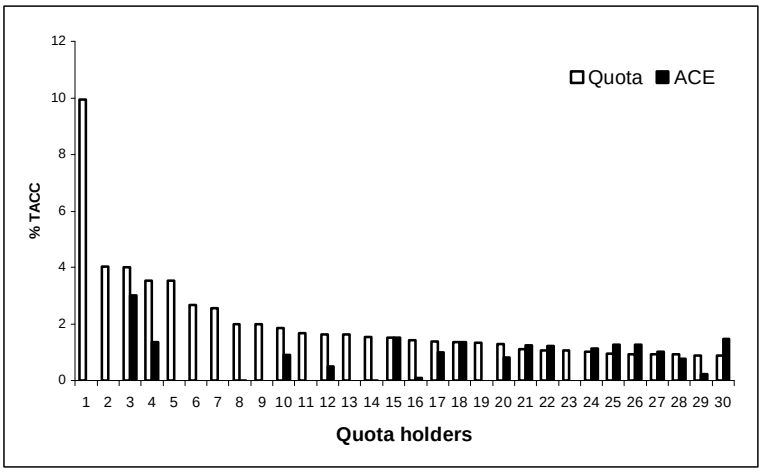
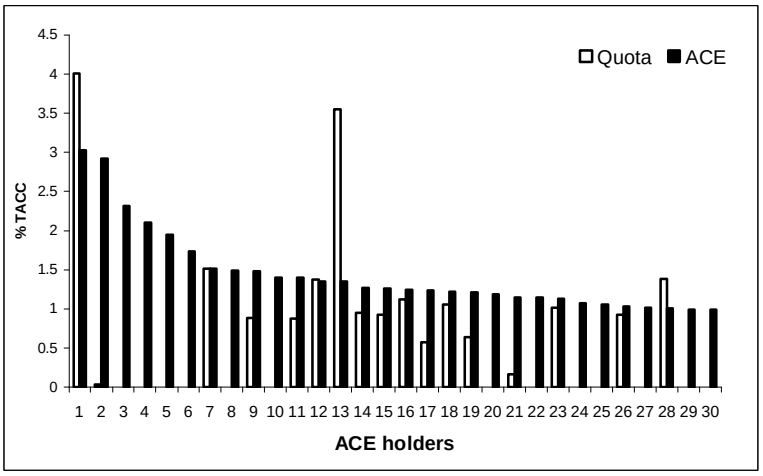


Figure 12: Holdings of top 30 ACE holders in FLA 1 for the 2003-04 fishing year, and quota held by each ACE holder. Where the quota and ACE values are not the same, ACE trading has occurred.



Relevant Plans and Other Matters

139 Before setting or varying any sustainability measure, the Minister must take into account:

- Any conservation or fisheries service;
- Any decision not to require such services;
- Any relevant fisheries plan approved under Part III of the Act;
- Any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991; and
- Any management strategy or plan under the Conservation Act 1987.

140 MFish does not consider that existing or proposed services materially affect the proposal for FLA 1. No fisheries plans have been submitted or approved that suggest management measures relevant to FLA 1. MFish is also not aware of any relevant statements in regional policy statements or plans, or any Department of Conservation conservation management strategies.

141 The Minister also needs to consider relevant provisions in 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. Flatfish are known to occur within the boundaries of the Hauraki Gulf. MFish considers that reviewing sustainability measures for flatfish will meet the purpose of the Hauraki Gulf Marine Park Act.

Research Plan

142 Flatfish research has focused on the productivity of individual species within the flatfish complex. Research has already been undertaken on the age and growth of turbot, brill, lemon sole, and New Zealand sole. Research is underway on the productivity of yellow-belly flounder.

143 A research project in 2002 (Beentjes 2003) investigated the species composition and catch statistics of flatfish fisheries in each QMA. This project showed that yellow-belly and sand flounder are the most commonly caught flatfish species in FLA 1. Project SAP2004/07 subsequently provided information on the relative contributions of yellow-belly and sand flounder to catches in the various sub-areas of FLA 1.

144 Project SAP2004/07 has also provided standardised catch per unit effort indices for FLA 1. There are currently no further plans for research on FLA 1. The workshop concluded that the decision on whether or not to update catch per unit effort analyses should be made after the final results of SAP2004/07 were reviewed. MFish considers that there would be merit in continuing the analysis.

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