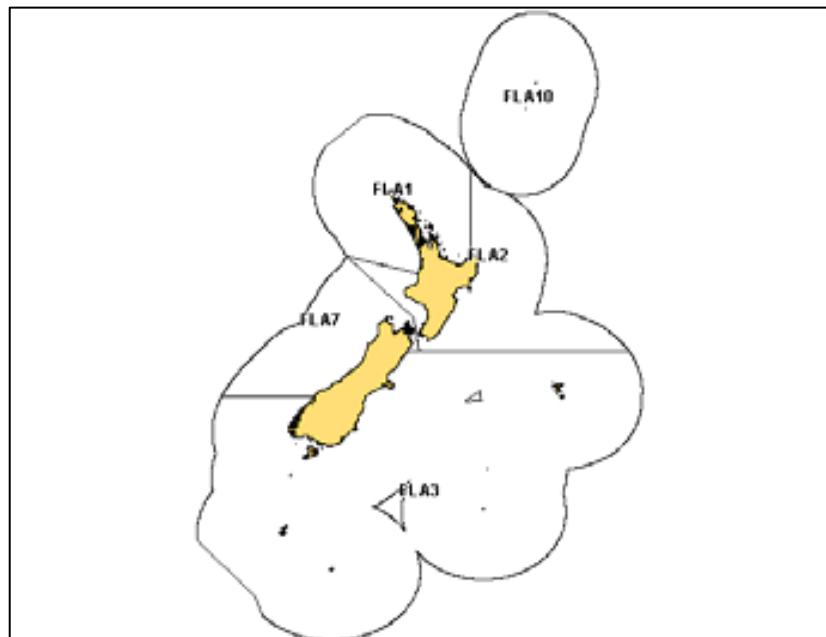


# FLATFISH (FLA 3) - INITIAL POSITION PAPER

Figure 2: Location of boundaries of the flatfish (FLA) Quota Management Areas.



## Executive Summary

- 1 The key issues to consider for flatfish (FLA 3) are as follows:
  - a) Anecdotal information from commercial and recreational fishers suggests current catches are not sustainable. Some commercial fishers consider that intensive fishing effort in recent years is affecting the sustainability of FLA 3. Some recreational fishers consider FLA 3 abundance is so low that they are effectively being denied access.
  - b) Commercial fishers are normally unable to harvest the Total Allowable Commercial Catch (TACC) so there is typically more Annual Catch Entitlement (ACE) available than there is catch. This disparity creates incentives to overcapitalise catching capacity and race for catch – inefficiencies characteristic of open access fisheries.
  - c) The Minister of Fisheries (the Minister) has asked the Ministry of Fisheries (MFish) to review FLA 3 catch limits in response to these sustainability and utilisation problems.
  - d) MFish cannot yet determine the status of FLA 3 biomass relative to the biomass that would sustain the maximum sustainable yield ( $B_{MSY}$ ). The best available information suggests FLA 3 abundance is declining and that constant catch at the TACC is probably not attainable or sustainable.
  - e) MFish proposes four Total Allowable Catch (TAC) options including, three options with lower TACCs. The first option reflects status quo management.

- f) Flatfish abundance is naturally variable (in relation to environmental variables) and some commercial fishers are concerned that a lower TACC will limit their ability to catch more fish in years of high abundance. MFish notes that FLA 3 is listed on the Second Schedule of the Fisheries Act 1996, allowing the Minister to increase the TAC *during* the fishing year. There is no rationale for maintaining a high TACC to cover years of high abundance.
- g) Lower TACCs will have social and economic impacts on commercial fishers, although MFish notes that, with the exception of option 4, the TACC options reflect current catches. In addition, impacts need to be balanced against the longer term sustainability and utilisation benefits associated with shorter term TACC reductions.

## Summary of Options

2 The current TACC for FLA 3 is 2 681 tonnes. A TAC and other allowances have not yet been set for FLA 3. All options propose to base the TAC, TACC, and allowances on recent catches and/or historic allocations.

3 The following management measures are proposed for the FLA 3 fishery for the 2007-08 fishing year:

EITHER

a) Option 1 - set a TAC of 2 893 tonnes for FLA 3 and within that TAC set:

- i) a customary allowance of 5 tonnes;
- ii) a recreational allowance of 150 tonnes;
- iii) an allowance of 57 tonnes for other sources of fishing-related mortality; and
- iv) a TACC of 2 681 tonnes (the existing TACC).

OR

b) Option 2 - set a TAC of 1 974 tonnes for FLA 3 and within that TAC set:

- i) a customary allowance of 5 tonnes;
- ii) a recreational allowance of 150 tonnes;
- iii) an allowance of 39 tonnes for other sources of fishing-related mortality; and
- iv) a TACC of 1 780 tonnes.

OR

c) Option 3 - set a TAC of 1 617 tonnes for FLA 3 and within that TAC set:

- i) a customary allowance of 5 tonnes;
- ii) a recreational allowance of 150 tonnes;
- iii) an allowance of 32 tonnes for other sources of fishing-related mortality; and

- iv) a TACC of 1 430 tonnes.
- d) Option 4 - set a TAC of 980 tonnes for FLA 3 and within that TAC set:
  - i) a customary allowance of 5 tonnes;
  - ii) a recreational allowance of 150 tonnes;
  - iii) an allowance of 20 tonnes for other sources of fishing-related mortality; and
  - iv) a TACC of 805 tonnes.

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

**Table 1: The proposed TAC (tonnes), TACC (tonnes) and allowances for FLA 3 for the 2007-08 fishing year**

	Proposed TAC (tonnes)	Customary allowance (tonnes)	Recreational allowance (tonnes)	<i>Other sources of fishing-related mortality (tonnes)</i>	Proposed TACC (tonnes)
Option 1 (TAC based on present TACC)	2 893	5	150	57	2 681
Option 2 (TAC based on recent catch)	1 974	5	150	39	1 780
Option 3 (TAC based on the last 5 years catch)	1 617	5	150	32	1 430
Option 4 (TAC based on estimate of MCY)	980	5	150	20	805

## Rationale for Management Options

- 5 MFish proposes to set the TAC for FLA 3 using s 13 of the Act.
- 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 3 because:
- a) it is possible to estimate the MSY for 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 The Act specifies a requirement to set a TAC that maintains or moves FLA 3 towards a level that can produce the maximum sustainable yield (MSY), having regard to the interdependence of stocks (*ref s 13(2)*). MSY is defined, in relation to any fishstock, as being the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the population dynamics of the stock and any environmental factors that influence the stock.
- 8 The Minister must set a TAC under s 13 that:
- a) Maintains the stock at or above a level that can produce the MSY; or
  - b) Enables any stock that is currently below a level that can produce the MSY to be restored to a level at, or above, that which can produce the MSY; or
  - c) Enables the level of any stock currently above the MSY to be altered in a way and at a rate that will result in the stock moving towards the MSY.

### ***Stock status***

- 9 FLA 3 consists of 8 species of right-eyed flounders and sole managed as one stock complex - lemon sole (*Pelotretis flavilatus*), New Zealand sole (*Peltorhamphus novaezealandiae*), yellowbelly flounder (*Rhombosolea leporina*), sand flounder (*Rhombosolea plebeia*), greenback flounder (*Rhombosolea tapirina*), black flounder (*Rhombosolea retiaria*), turbot (*Colistium nudipinnis*), and brill (*Colistium guntheri*).
- 10 There is little information on whether the FLA 3 stock is at, above, or below the level that can produce the MSY. There is no research information on the abundance of flatfish in FLA 3. Estimates of current and reference biomass are not available for flatfish in FLA 3. Stock assessments for flatfish have been based on estimating MSY in terms of Maximum Constant Yield (MCY)<sup>42</sup>. The yield estimates are based on commercial landings. The

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<sup>42</sup> MCY was estimated using the equation,  $MCY = cYav$  (Method 4).  $Yav$  is the reported catch over the period October 1983 to September 1988, and  $c$  was set equal to 0.6 based on the estimate of  $M = 1.1-1.3$ . These estimates of MCY are based on reported landings during a period of decreasing effort and are considered conservative.

management of eight species in one management group has inherent risks. At present, the population dynamics of individual flatfish species is poorly understood.

- 11 Annala et al (2001) estimated the FLA 3 MCY based on the average commercial landings from 1983-84 to 1987-88 (these years reflect stable effort and catches). The FLA 3 MCY only applies to the commercial fishery and is illustrated in Table 2 below.

**Table 2: Yield estimates (t) (rounded to the nearest 10 t)**

<b>Parameter</b>	<b>Fishstock</b>	<b>Estimate</b>
MCY	FLA 3	980

- 12 Anecdotal information on declining recruitment suggests that flatfish abundance may be declining. The 2006 plenary report noted that: “The sizes of the populations depend heavily on the strength of the recruiting year classes and are therefore highly variable. For this reason, a constant catch at the level of the current TACC is unlikely to be attainable or sustainable, nor would it be likely to allow stocks to move towards a size that would support the MSY.” The current landings and TACC are 40% and 170% respectively above the level that is considered sustainable using yield estimates based on the estimated maximum constant yield.
- 13 Recreational fishers participating in the regional MFish Recreational Fishing Forum are concerned about the sustainability of the current TACC. Forum members state they have stopped fishing for flatfish because of the decreased abundance. Forum members consider the current catch limits are denying them access to FLA 3.
- 14 Some commercial fishers are also of the view that the FLA 3 TACC (2 681 tonnes) is not sustainable. Since 1983, the average landing of FLA 3 has been 1 772 tonnes. They are concerned that the intensive fishing that has taken place in recent years is affecting the sustainability of the stock.
- 15 Customary fishers have only taken 65% of the authorised FLA 3 catch over the last five years. The reasons for this are unknown but may include inability to access sufficient flatfish.

### ***Existing catch limits***

- 16 The inclusion of flatfish in the QMS was based partly on the assumption that a TACC would act to decrease competition for catch in poor years. However, current flatfish TACCs do not operate in this way. The original TACC for FLA 3 was set at a high level of 2 681 tonnes, based on 1983 catch levels that were the highest on record, to allow high levels of commercial catch in years of high abundance.<sup>43</sup> It also accommodated quota appeals from quota holders following inclusion in the QMS. The TACC has not been fully caught since it was set, and it is substantially above the level of current catches.
- 17 FLA 3 is effectively an open access fishery because there is usually more ACE available than can be caught. There is intense competition for flatfish in poor years, both among commercial fishers, and between commercial and recreational fishers, and this accentuates bycatch problems.

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<sup>43</sup> 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).

- 18 Fishers target fishing for flatfish often run out of ACE for associated bycatch species, but use their uncaught flatfish ACE to continue target fishing, regardless of by-catch (which may be dumped or deemed). This is a problem that is associated with many of the inshore multi-species trawl fisheries. The high TACCs set for species like flatfish, whose availability is highly variable, provides an incentive to maximise target catch regardless of how much bycatch ACE is held. Although ACE is not required to go to fishing most fishers prefer to have allocated ACE rather than pay deemed value prices.
- 19 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 even if it is purely natural variability.
- 20 Reducing the TACC would reduce the amount of unfished FLA 3 ACE. It will help “close” the current open access characteristics of FLA 3 and provide a framework for fishers to obtain more value from the FLA 3 stock. Options 1 to 3 reflect current catches and will not unduly constrain catches. Option 4 is more conservative and will constrain catch below recent levels.
- 21 MFish notes that it is currently consulting on a proposal to increase the squid TAC (TAC set under s14, and on the Third Schedule of the Act; refer Initial Position Paper with this document). The fishery and biological characteristics of flatfish and squid are sufficiently different to warrant different management approaches. Flatfish is longer lived than squid and, while the abundance of flatfish varies, it does so over longer time periods and at a smaller scale than squid. Flatfish is also a shared fishery and recreational fishers are finding that what was once an abundant and accessible species is now an uncommon catch under current management.

### ***Option 1***

- 22 Option 1 proposes a TAC of 2 876 tonnes, with a TACC of 2 681 tonnes. This is, in effect, the status quo TACC with additional allowances based on current catch estimates to create a TAC.

### ***Option 2***

- 23 Option 2 proposes a TAC of 1 975 tonnes, including a TACC of 1 780 tonnes. Commercial catch is averaged over 15 years to account for any cyclical changes in flatfish catches over time. For example, commercial catches have peaked twice in the last 20 years, in 1988-89 and between 1995 and 1998 (refer Figure 2). The 15 year period incorporates the years 1995-96 to 1997-98 during which flatfish catches were substantially higher than in other years. Other allowances are as per option 1.

### ***Option 3***

- 24 Option 3 sets the TAC at 1 625 tonnes. It uses the same estimates for customary and recreational catch, and other sources of fishing-related mortality as option 2 but sets a lower TACC of 1 430 tonnes. This TACC is calculated from commercial catches over a different period, the average of the last five years 2001-06.

## ***Option 4***

- 25 Option 4 sets the TAC at 980 tonnes. It uses the same estimates for customary and recreational catch, and other sources of fishing-related mortality as option 2 but sets a lower TACC of 785 tonnes. This TAC is calculated from the estimate of MCY<sup>44</sup>.

## **Assessment of management options**

- 26 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.
- 27 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 and may not be attainable. A TAC needs to be set that is more likely to fulfill the obligation to move FLA 3 towards the level that can produce the MSY.
- 28 The following sources of information have been considered in proposing a TAC for FLA 3:
- Best available information about the status of the stock from 2006 Plenary (including the MCY estimate for FLA 3);
  - The existing commercial catch limit; and
  - Catch information and assumptions of other sources of fishing-related mortality.
- 29 Catch information and estimates of other sources of fishing-related mortality are considered the most appropriate basis for setting the TAC.

## ***Proposed TAC options***

- 30 Option 1 is the status quo TACC with additional allowances to make the TAC. Options 2 and 3 propose to base the TAC for FLA 3 on current catches. Option 4 is based on the estimate of MCY
- Option 1 - TAC based on current TACC, plus estimates of recreational and customary catches and other sources of fishing-related mortality based on estimates of current catch (2 893 t);
  - Option 2- TAC based on 15-year average of commercial catches, plus estimates of recreational and customary catches and other sources of fishing-related mortality based on estimates of current catch (1 974 t);
  - Option 3 - TAC based on average of the last 5 years of commercial catches, plus estimates of recreational and customary catches and other sources of fishing-related mortality based on estimates of current catch (1 617 t); and

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<sup>44</sup> MCY was estimated using the equation,  $MCY = cY_{av}$  (Method 4).  $Y_{av}$  is the reported catch over the period October 1983 to September 1988, and  $c$  was set equal to 0.6 based on the estimate of  $M = 1.1-1.3$ . These estimates of MCY are based on reported landings during a period of decreasing effort and are considered conservative.

- Option 4 –TAC based on MCY estimate, plus estimates of recreational and customary catches and other sources of fishing-related mortality based on estimates of current catch (980 t).

- 31 MFish assesses FLA 3 as a ‘stable’ fishery (rather than a developing fishery). Reported commercial catches have remained relatively constant over an extended period, at around 1 200 to 1 800 tonnes. Peaks occurred in 1988-89 (2 458 tonnes) and 1996-97 (2 573 tonnes).
- 32 The potentially high natural variability of flatfish has been taken into account by providing the four options on which to base the TAC.
- 33 The 2006 Plenary report suggests it is unlikely that a TAC based on the current TACC of 2 681 tonnes (option 1) would move FLA 3 towards a level that would support the MSY, nor will it alleviate the concerns expressed by recreational and some commercial fishers. Option 1 involves the greatest risk to stock sustainability, given that the current stock status of FLA 3 is unknown.
- 34 Option 2 would prevent additional catch or effort in this fishery. It takes into account the uncertainty about the biomass level that will produce the MSY, and the concerns of recreational and some commercial fishers regarding the sustainability of the fishery.
- 35 Option 3 would prevent any additional catch or effort in FLA 3. In some years, catch may be constrained (although the TACC could be increased using the Second Schedule for such years). This option places greater emphasis on historic and recent lower catches and less on the occasional peak years. It also places more weight on the concerns of recreational and some commercial fishers.
- 36 Option 4 is a conservative approach that would use an MCY strategy as a proxy for MSY to maintain or move FLA 3 towards a level that can support MSY. The level of risk to the stock by harvesting the population at the estimated MCY value cannot be determined given current information. FLA3 comprises eight species of right-eyed flounders and sole (refer Annex 1) and the proportion that each species contributes to the catch is expected to vary annually. It is not possible to estimate MCY for each species and stock individually.

### ***Other factors***

- 37 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.
- 38 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.
- 39 Lemon sole, English sole, 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 the MSY if it is currently below that level. There is also uncertainty about whether current removals are likely to affect flatfish recruitment and abundance. For these

reasons, it is considered necessary to propose an option where the TAC is below the level of current catches. Nonetheless, it is desirable to constrain the potential for any additional effort and catch occurring in FLA 3 where recruitment may be declining. The impact of any reduction could be monitored and further management action taken if required.

## **Allocation of the TAC**

40 The proposed allowances and TACCs are outlined in

Table 2.

41 It is proposed to determine allowances and TACCs based on each sector's current use of the fishery. FLA 3 is a valuable resource for both non-commercial and commercial fishers.

42 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.<sup>45</sup> The section on *Statutory obligations and policy guidelines* at the start of this document gives further information about allocation.

43 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.

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

### ***Recreational catches***

45 It is proposed that 150 tonnes be used as the estimate for recreational catch as a guide for calculating the recreational allowance. The same estimate is proposed for options 1, 2, 3 and 4.

46 Surveys of recreational fishing in 1992-94, 1996, 1999-00, and 2000-01 provide estimates of the recreational harvest of flatfish in FLA 3. 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 3 to be approximately 136-252 tonnes. Annex 1 contains further information on the recreational surveys.

47 The recreational survey estimates have relatively large ranges (30-50 tonnes in the 1996 survey and 127-252 tonnes in the 1999-2000 survey). 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.

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<sup>45</sup> 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.

### ***Customary Maori catches***

- 48 It is proposed that 5 tonnes be used as the estimate for customary Maori catch. The same estimate is proposed for options 1, 2, 3 and 4.
- 49 Tangata Tiaki have been appointed under the Fisheries (South Island Customary Fishing) Regulations 1999 (Customary regulations) for most of FLA 3 for at least five years. Customary authorisations show that 9000 fish were authorised to be taken between 1998 and 2006, but only 4000 were actually taken. It is likely that much of the FLA catch taken by tangata whenua is taken as recreational catch.

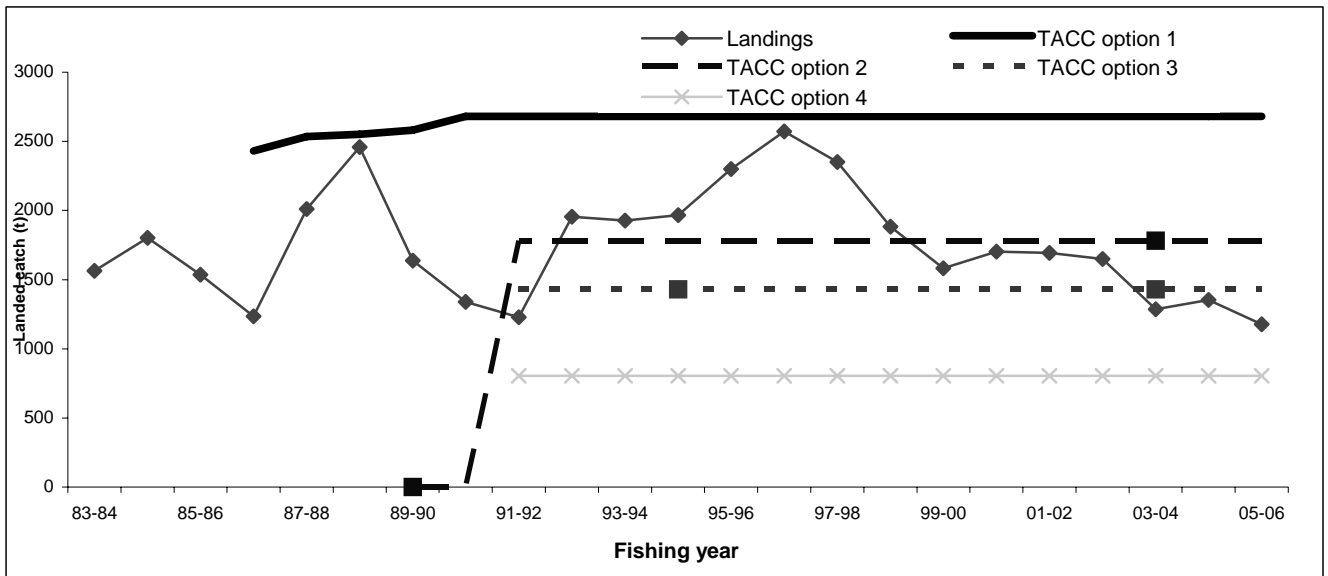
### ***Estimate of other sources of fishing-related mortality***

- 50 MFish proposes to include an estimate for other sources of fishing-related mortality for FLA 3. No allowance is currently set, but there are various potential sources of fishing-related mortality in FLA 3, 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; and
  - Both commercial and recreational fishers may lose nets. Such ‘ghost nets’ can continue to catch fish for some time.
- 51 Because there is no quantitative information on other sources of fishing-related mortality, the proposed allowance is based on approximately 2% of the estimated commercial and non-commercial take.

### **TACC**

- 52 MFish proposes four TACC options.
- a) Option 1 – Status quo (2 681 t)
  - b) Option 2 – 15-year average of commercial catches (1 780 t)
  - c) Option 3 – last 5 year average of commercial catch (1 430 t)
  - d) Option 4 – TACC based on MCY less allowances (805 t)

**Figure 3: Landings, current TACC and proposed TACCs. Option 1 Existing TACC; Option 2: 15-year average of landings; option 3: 5-year average of landings 2001-06; option 4: MCY estimate**



- 53 Options 1 and 2 maintain the commercial catch limit at or above current catch levels
- 54 The TACC in option 3 (1 430 tonnes) is less than past catches have been in some years, so is likely to have greater socio-economic impacts than option 2. Because most of the FLA 3 catch is targeted, fishers may be able to adjust their activities without necessarily exceeding the TACC. Option 3 will reduce the amount of unfished FLA 3 ACE and “close” the current open access characteristics of FLA 3 to a greater extent than option 2.
- 55 Option 4 decreases the TACC below current catches in line with the estimate of MCY. The Act defines TAC in terms of MSY. The definitions of the biological reference points, Maximum Constant Yield (MCY) and Current Annual Yield (CAY), derive from two ways of viewing MSY: a static interpretation and a dynamic interpretation. The static interpretation is MCY, which is based on the idea of taking the same catch from the fishery year after year. MCY is defined as the maximum constant catch that is estimated to be sustainable, with an acceptable level of risk, at all probable levels of biomass. The acceptable level of risk is why the MCY is conservative.

***Economic impacts***

- 56 FLA 3 has a relatively high commercial value, and a large number of fishers are involved in the fishery. The port price was estimated at \$2.96 per kg in 2006. Conversely, FLA 3 quota trades at a low amount (generally \$3.50-\$4.50 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. But because the TACC has never been caught, it is more meaningful to compare the opportunity cost between average landings in recent fishing years (2001-06) to what fishers would be constrained to under the new TACC (Table 3).

**Table 3: ‘Opportunity cost’ of decreases to the TACC (based on average landings of 1 430 tonnes in 2001-06)**

	Option 1 (2 681t)	Option 2 (1 780t)	Option 3 (1 430 t)	Option 4 (805 t)
Difference between proposed TACC and 2001-06 average catch (tonnes)	+1 250	+350	0	-625
Potential loss to commercial industry (based on 2006 port price)	Nil	Nil	Nil	\$1 850 000

- 58 Because FLA 3 is listed on the Second Schedule of the Act, there is provision for an in-season increase to the TAC (under s 13(7)). This provision will potentially mitigate some of the lost opportunity costs because catches could be increased during years of high abundance. Using this provision may require some other way of assessing abundance, with potential cost-recovery implications for fishers. A possible mechanism for this will be the project FLA 2007-01 (which has high priority for 2007-2008) which will analyse CPUE.
- 59 Most of the FLA 3 commercial catch is taken by fishers who do not own quota, but buy 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 1 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 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***

- 62 Flatfish is an important recreational fish species. Important recreational fisheries for sand, black and yellow-belly flounder occur in most estuaries, coastal lakes and coastal inlets throughout the South Island, including the east coast harbours and estuaries, shallow bays, and Lake Ellesmere. The main methods are set netting, drag netting, and spearing.
- 63 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 (refer Annex 1).
- 64 The relatively high estimates of non-commercial catches indicate that, at least until 2000, recreational and customary fishers were still able to catch flatfish.
- 65 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 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. Decreasing the TACC and making allowances for recreational catch goes some way to addressing these issues.

## Other Management Controls

### *Deemed value*

66 MFish considers it is not necessary to alter the existing deemed value at this stage. As Annex 1 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 (refer Table 12).

### *Future management*

67 The proposed allocation of the new TAC under options 2, 3 or 4 would reduce the current TACC. MFish requests feedback from stakeholders on the proposed options. 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:

- quota and ACE prices;
- quantity of deemed values paid;
- analysis of CPUE data;
- anecdotal evidence about the impact of any change implemented; and
- targeted research on individual flatfish species.

68 Because changes in fishing gear used over time could also bias trends in catch per unit effort, MFish will commission research to investigate this factor.

69 MFish intends to investigate a fishery-independent relative abundance estimate from customised research work. Because recruitment and abundance in the largest commercial fisheries in FLA 3 appear to be declining, this research would be advanced as a priority through the research planning process that MFish regularly runs.

70 MFish will undertake further surveys to determine levels of recreational catch, including in FLA 3. MFish would also welcome submitters providing further information on the social and customary importance of flatfish.

71 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.

72 MFish intends to begin working with Tangata Whenua and stakeholders on a Fisheries Plan for the southern finfish stocks within the next three years. Other flatfish management issues, such as managing eight species as one stock complex, will be addresses within the context of this plan.

## Statutory Considerations

73 The following statutory considerations have been taken into account when forming the management options for FLA 3:

- a) The purpose of the Act is to provide for the use of fisheries resources while ensuring sustainability. Because information about flatfish abundance is uncertain, MFish has provided four options that could be consistent with the Act's purpose. The options propose a TAC for sustainability purposes, and allowances for commercial, recreational, and customary fishers.
- b) The TAC set under s 13 should be set at the level that can produce the MSY, or move the stock towards that level. As noted, there is uncertainty about where FLA 3 is in relation to the level that can produce the MSY. Because of this uncertainty, four TAC options are proposed. MFish considers, on the information available, that options 2, 3 and 4 are more likely to maintain or move the stock towards a level that can support 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 the 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)); and
  - iii) Most flatfish is caught in target bottom trawl fisheries that catch a range 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 biological information to suggest that the interdependence of stocks should affect the level of the TAC set for FLA 3 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 the MSY (s 13(3)). MFish has identified differing social and economic consequences of altering the TAC and TACC under each of the four 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 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; and

- 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. All options are therefore considered to adequately take into account these environmental principles).
- h) Associated or dependent species (s 9(a)) 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 South Island east coast where endangered Hector’s dolphins have been caught in commercial and non-commercial set nets and in commercial trawl nets. To manage this risk, set netting has been controlled by codes of practice and regulation in areas of concern on the coast within FLA 3. There have been reports of Hector’s dolphin sightings in some east coast harbours and estuaries where set netting for flatfish sometime occurs. The proposed TAC options will not result in set net effort increasing in areas where Hector’s dolphins 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. Because no increase in fishing effort is anticipated, it is not expected that 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 3 are consistent with these international obligations.
- k) Existing control measures have been considered when making recommendations for any change to measures used to control the FLA 3 fishery (as outlined in s 11(1)(b)).
- l) No relevant fisheries plan has been approved under s 11(2A)(b) of the Act.
- m) As discussed in Annex 1, 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. MFish does consider that some further research to update the catch per unit effort analysis for FLA 3 is required and project FLA 2007-01 will be carried out in 2007-2008. 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). See Annex 1 Table 11 & 12.
- n) **Fiordland (Te Moana o Atawhenua) Marine Management Act 2005:** In recognition of the Fiordland (Te Moana o Atawhenua) Marine Area's local, national, and international importance, unique marine environment, distinctive biological diversity, and outstanding landscape and cultural heritage, the Government passed the Fiordland (Te Moana o Atawhenua) Marine Management Act 2005 (the 2005 Act). The Fiordland Marine Area is within the FLA 3 QMA. (See Figure 2).

- o) The purpose of the 2005 Act includes establishing the Fiordland Marine Guardians to provide advice on fisheries management, biosecurity, sustainable management, and marine preservation and protection. The 2005 Act also seeks to facilitate and promote co-operation between the Guardians and management agencies, to assist in achieving the integrated management of the Fiordland Marine Area.
- p) Section 12 of the Act establishes the Fiordland Marine Guardians. Section 13 of the 2005 Act states that the functions of the Guardians are, *inter alia*, to advise and make recommendations to management agencies and Ministers who exercise functions under specified enactments (including the Fisheries Act), to achieve the purpose of this Act. This includes, but is not limited to, advice and recommendations on the effectiveness of management measures in the Fiordland (Te Moana o Atawhenua) Marine Area.
- q) The 2005 Act goes on to state in s 26 that all management agencies exercising powers or carrying out functions in the Fiordland (Te Moana o Atawhenua) Marine Area must take into account any advice or recommendations provided by the Guardians (this includes powers and functions under the Fisheries Act 1996).
- r) FLA 3 includes the Fiordland coast and the Ministry will seek specific comment from the Fiordland Marine Guardians on the proposals.
- s) 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 (sections 21(1)(a and b), 21(4)(i and ii) and 21(5)). There are currently three mātaihai reserves within FLA 3. Areas have been closed for customary fishing purposes in FLA 3, but the closures do not affect flatfish fisheries. There is no commercial fishing in the internal waters of Fiordland - introduced in 2005 as part of the Fiordland Marine Management Strategy to reduce fishing pressure in this area.
- t) Section 10 sets out information principles that are to be taken into account when setting TACs.
- u) MFish has used the surveys of recreational fishing in 1999-00 and 2000-01 as the basis for estimates of recreational catch in FLA 3. Limitations are acknowledged with the use of these surveys. In the absence of other information on recreational catches, the surveys are nonetheless considered to provide the best available information.

## Conclusion

- 74 The TACC for FLA 3 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 maintain or move FLA 3 towards a level that can support MSY.
- 75 MFish considers it unlikely that a TAC incorporating the current TACC of 2 681 tonnes (as well as allowances for recreational and customary catches) would move FLA 3 towards a level that would support MSY. This TACC was set at a high level as result of quota appeals, following introduction to the QMS and was intended to allow high levels of commercial catch in years of high abundance.

- 76 Although MFish recognises that commercial fishers are not obliged to fully catch their catch entitlements, the existing TACC appears to be too high, given that it has never been caught. In addition, recent information indicates that inter-annual abundance is not as variable as previously thought in flat fish stocks.
- 77 Option 1 involves the greatest risk to stock sustainability, given that the current stock status of FLA 3 is unknown. The current plenary assessment for the stock is that, if it were fully caught, the existing TACC is unlikely to move FLA 3 towards a level that could sustain the maximum sustainable yield (MSY).
- 78 Options 2 and 3 both propose to base the TAC on estimates of recent catches. The two options differ in the period over which they estimate current commercial catch. Option 2 averages commercial catch over a fifteen year 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. Option 2 allows fishers to cover catch with ACE in most years and presents a lower sustainability risk than option 1.
- 79 Option 3 averages commercial catches over the last five years. This option more closely reflects historic low catches in the commercial fishery. Using the period of lower average catch also makes more allowance for the possible decline in flatfish abundance and recruitment. Commercial catches have exceeded the TACC proposed under option 3 in most years. Option 3 is a more conservative option with respect to sustainability risk and reduces the open access nature of the present fishery. This option places a greater constraint on commercial fishers. However, because FLA 3 is largely a target fishery, commercial fishers should be able to constrain their catches within the TACC proposed under option 3.
- 80 Option 4 uses the estimate of MCY as a proxy for MSY. This option places the TACC well below current and historic catch levels. This option removes the pressure on bycatch stocks and ends the open access nature of the present fishery. Option 4 has the greatest social and economic impact. The level of risk to the stock by harvesting the population at the estimated MCY value cannot be determined.
- 81 MFish requests feedback from stakeholders on the likely affects of the proposed measures.

## Preliminary Recommendations

- 82 MFish proposes that for the 2007-08 fishing year:
- a) **Option 1** - set a TAC of 2 863 tonnes for FLA 3 and within that TAC set:
    - i) a customary allowance of 5 tonnes;
    - ii) a recreational allowance of 150 tonnes;
    - iii) an allowance of 57 tonnes for other sources of fishing-related mortality; and
    - iv) a TACC of 2 681 tonnes.
- OR
- b) **Option 2** - set a TAC of 1 974 tonnes for FLA 3 and within that TAC set:
    - i) a customary allowance of 5 tonnes;
    - ii) a recreational allowance of 150 tonnes;

- iii) an allowance of 39 tonnes for other sources of fishing-related mortality; and
- iv) a TACC of 1 780 tonnes.

OR

c) **Option 3** - set a TAC of 1 617 tonnes for FLA 3 and within that TAC set:

- i) a customary allowance of 5 tonnes;
- ii) a recreational allowance of 150 tonnes;
- iii) an allowance of 32 tonnes for other sources of fishing-related mortality; and
- iv) a TACC of 1 430 tonnes.

OR

d) **Option 4** - set a TAC of 980 tonnes for FLA 3 and within that TAC set:

- i) a customary allowance of 5 tonnes;
- ii) a recreational allowance of 150 tonnes;
- iii) an allowance of 20 tonnes for other sources of fishing-related mortality; and
- iv) a TACC of 805 tonnes.

## ANNEX 1

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### Fishery Information and biological characteristics

- 83 Flatfish is a generic term used to describe 8 main species of right-eyed flounders and sole within New Zealand's fisheries waters. Flatfish are defined by the Fisheries (Amateur Fishing) Regulations 1986 and the Fisheries (Commercial Fishing) Regulations 1986 as: lemon sole (*Pelotretis flavilatus*), New Zealand sole (*Peltorhamphus novaezealandiae*), yellowbelly flounder (*Rhombosolea leporina*), sand flounder (*Rhombosolea plebia*), greenback flounder (*Rhombosolea tapirina*), black flounder (*Rhombosolea retiaria*), turbot (*Colistium nudipinnis*), and brill (*Colistium guntheri*).
- 84 Flatfish are shallow water species that generally inhabit the coastal waters (less than 50 meters deep) around New Zealand's coastline, although some species occur to moderate depths on the continental shelf and beyond.
- 85 Virtually all of the 14 or so species of flatfish found in New Zealand waters are unique to New Zealand<sup>46</sup>. There is evidence that many stocks are localised and the interrelationships of neighbouring populations have not been thoroughly studied. The best available information results from studies on the variation in morphological characteristics of sand flounder and from tagging studies of sand and yellow-belly flounder. These studies indicate that sand flounder off the east and south of the South Island appear to be a single, continuous population<sup>47</sup>. Sand flounder stocks off the east and south of the South Island are clearly different from stocks from central New Zealand waters and from those off the west coast of the South Island. Tagging experiments show that sand flounders, and other species of flounder, can move substantial distances off the east and south coasts of the South Island.

#### *Age, size and growth*

- 86 New Zealand flatfish species are believed to be fast growing, short-lived and prolific. Recent research on brill and turbot<sup>48</sup> indicates that growth is rapid for the first 3 years of their life and then slows afterwards. Females generally grow larger and faster than males.

#### *Size at maturity*

- 87 Flatfish reach maturity between 2-4 years. Most species grow up to 20 to 40 cm at maturity, although size does vary slightly between species. Sole species generally grow to approximately 50cm and flounders to 45cm. Brill and turbot grow to a larger size than other species, reaching 70 to 80 cm in length.

#### *Maximum age*

- 88 Most species only survive to 3-4 years of age, with very few reaching 5-6 years. Brill and turbot may survive to maximum ages of 21 and 16 years respectively<sup>49</sup>.

#### *Natural Mortality*

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<sup>46</sup> Recent studies by Van Den Enden et al. (2000) indicate that there is a significant genetic difference between the New Zealand and Australian populations of *Rhombosolea tapirina*.

<sup>47</sup> Studies in Tasman Bay and the Hauraki Gulf indicate that flatfish in fairly enclosed waters may be effectively isolated from neighbouring populations and should be considered as separate stocks.

<sup>48</sup> Ministry of Fisheries Research project FLA2000-01

<sup>49</sup> Much of the early research done on the age of lemon sole is unsatisfactory.

89 Little is known about the natural mortality of flatfish. The mortality of sand flounder, in Canterbury, has been calculated at 1.1 to 1.3.

***Spawning and breeding behavior***

90 Juveniles congregate in sheltered inshore waters, e.g., estuarine areas, channels, shallow mudflats and sandflats, where they remain for up to two years. Juvenile survival is highly variable. Flatfish move offshore for first spawning at 2–3 years of age during winter and spring. Adult mortality is high, with many flatfish spawning only once and few spawning more than two or three times. Fecundity is high, e.g., from 0.2 million eggs to over a million eggs in sand flounders.

***Research on Biology and distribution of Flatfish***

91 There has been little research into the biology of flatfish and their ecological relationships. Most studies were carried out in the 1970s on sand flounder. Recently, there have been a number of studies on brill and turbot but, in general, flatfish in FLA 3 must be considered to be poorly understood.

**Table 4: The main characteristics of flatfish species.**

Species	Habitat	Size	Fishing methods
Sand flounder	NZ only. Widespread in inshore sandy areas and mouths of rivers.	25-35 cm (up to 45 cm)	Recreational: beach seines and set nets. Commercial: trawling and set nets.
Yellow belly flounder	NZ only. Widespread in sandy areas and seafloor, sheltered bays, estuaries, and harbours.	25-35 cm (up to 45 cm)	Recreational: beach seines and set nets. Commercial: trawling and set nets.
Greenback flounder	NZ and southern Australia. Moderately common in shallow coastal areas.	25-40 cm	Recreational: seines, set nets and spears. Commercial: set nets and sometimes eel traps.
Black flounder	NZ only. Common in river estuaries.	15-25 cm	Recreational: set nets and beach seines. Commercial: trawl.
Turbot	NZ only. Southern coastal areas.	25-45 cm	Set nets and beach seines. Commercial: trawl.
Brill	NZ only. Southern areas.	25-40 cm. (Up to 70 cm.)	Set nets; Commercial: trawl.
New Zealand sole	NZ only. Inshore sandy areas.	25 – 35 cm.	Trawlers.
Lemon sole	NZ only. Shallow to mid shelf.	25-35cm. (Up to 50 cm)	Trawlers.

**Table 5: Estimates of biological parameters (Annala et al., 2001)**

<b>Fishstock</b>	<b>Estimate</b>			<b>Source</b>		
<b>1. Natural mortality (M)</b>						
Sand flounder Canterbury (FLA 3)	1.1-1.3			Colman (1978)		
<b>2. Weight = a (length)<sup>b</sup> (weight in g, length in cm total length)</b>						
	<b>Females</b>		<b>Males</b>			
New Zealand sole (FLA3)	a=0.03578	b=2.6753	a=0.007608	b=3.0728	McGregor (unpublished)	
<b>3. von Bertalanffy growth parameters</b>						
	<b>Females</b>			<b>Males</b>		
Sand flounder	<b>K</b>	<b>t<sub>0</sub></b>	<b>L<sub>∞</sub></b>	<b>K</b>	<b>t<sub>0</sub></b>	<b>L<sub>∞</sub></b>
Canterbury (FLA3)	0.235	-0.083	59.9	0.781	n.a.	37.4
						Mundy (1968), Colman (1978)

### *Catch Information*

#### *Commercial fishery*

92 Annual flatfish catches for FLA 3 in recent years have been between about 1 200 and 1 700 tonnes, but historically have varied two-fold. Peaks of 2 573 tonnes and 2 458 tonnes occurred in 1996-97 and 1988-89 respectively. See Table 6

**Table 6: reported landings (t) of Flatfish in FLA 3 for 1983-84 to 2005-06 and actual TACs (t) from 1986-87 to 2005-06**

<b>Fishing year</b>	<b>Catch landings (t)</b>	<b>TAC (t)</b>
1983-1984	1 564	-
1984-1985	1 803	-
1985-1986	1 537	-
1986-1987	1 235	2 430
1987-1988	2 010	2 535
1988-1989	2 458	2 552
1989-1990	1 637	2 585
1990-1991	1 340	2 681
1991-1992	1 229	2 681
1992-1993	1 954	2 681
1993-1994	1 926	2 681
1994-1995	1 966	2 681
1995-1996	2 298	2 681
1996-1997	2 573	2 681
1997-1998	2 351	2 681
1998-1999	1 882	2 681
1999-2000	1 583	2 681
2000-2001	1 702	2 681
2001-2002	1 694	2 681
2002-2003	1 641	2 681
2003-2004	1 286	2 681
2004-2005	1 353	2 681
2005-2006	1 177	2 681

- 93 Much of the catch in FLA 3 is targeted (between 85% and 97%). Around 95% of targeted FLA 3 landings are taken by bottom trawl, 3% is taken by set net and less than 1% by Danish seine. The majority of trawling occurs on the open coast from Pegasus Bay south to Te Waewae Bay. Danish seining occurs almost exclusively off Timaru. Peak catches in the trawl fishery occur in spring to autumn for most of FLA 3.
- 94 Commercial fishers predominantly (over 80% since 2001) catch flat fish when they are target fishing for it. The main associated bycatch was comprised of large quantities of red cod and lesser amounts of barracuda, skate, elephant fish, giant stargazer, gurnard, spiny dogfish and tarakihi.

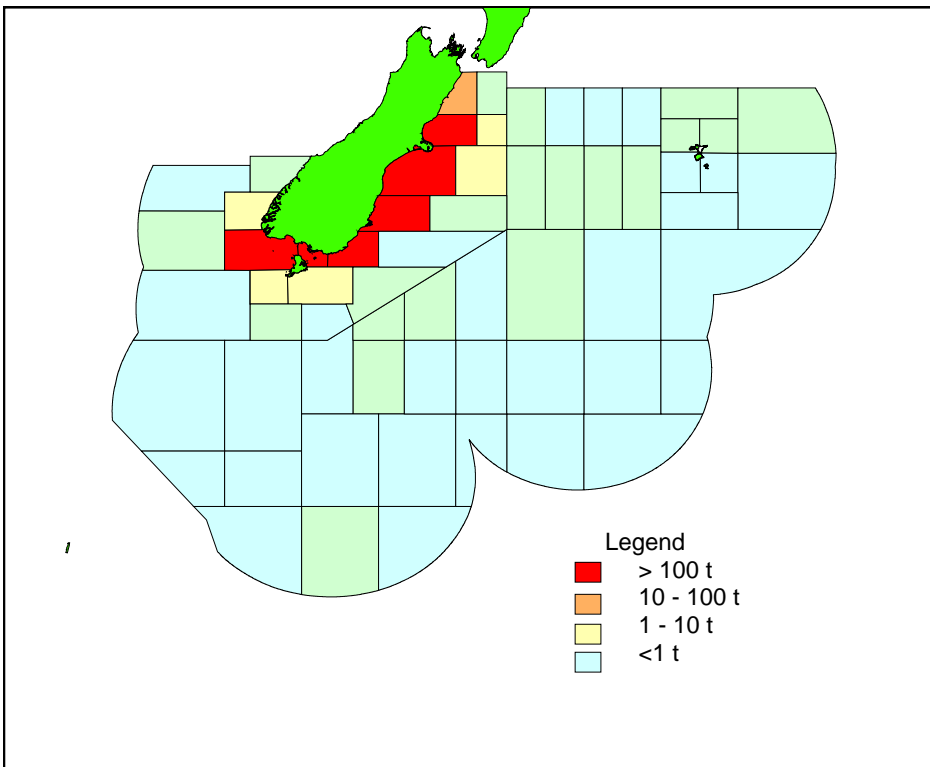
***Flatfish caught as a by-catch of other fisheries***

- 95 Flatfish is a minor bycatch of other targeted species, e.g. elephant fish, hāpuku and bass, ling, red cod, red gurnard, rig, school shark, sea perch, tarakihi, and yellow eyed mullet. Flatfish is only a significant bycatch when fishing for red cod.

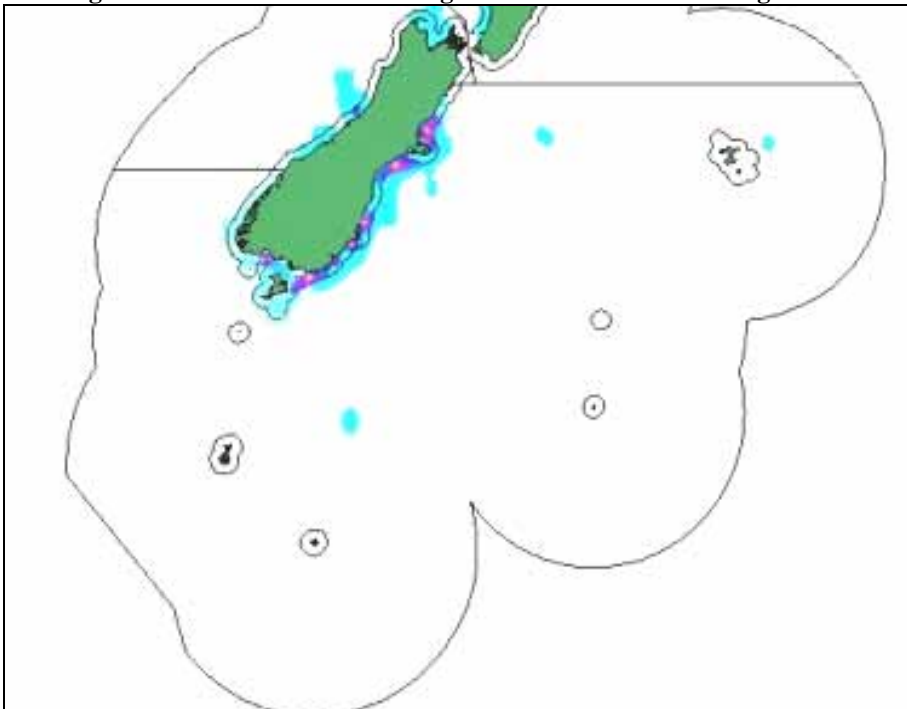
***Spatial variation in FLA 3 catch***

- 96 The amount of flatfish caught varies around FLA 3. The largest commercial takes are in the inshore areas along the eastern and southern coast, with the Catlins (Stat Area 026), Pegasus Bay (Stat Area 020) Canterbury Bight (Stat Area 022), Otago (Stat Area 024), Foveaux Strait (Stat Area 025), and Te Waewae Bay (Stat Area 030) the source of most commercial catch.
- 97 Most statistical areas show a decrease in catch over the 1998-99 and 1999-2000 fishing years with a recovery in 2000-2001, the exceptions being Pegasus Bay (Stat Area 020), where the catch continued to decrease in 2005-2006, and Te Waewae Bay where the catch has continued to increase throughout the 2000 s.

**Figure 3: Map showing the variation in the flatfish catch in FLA 3 1995-96 to 2005-06.**



**Figure 4: Schematic diagram showing the main flatfish fishing grounds. Information is a combination of latitude and longitude from catch effort landing returns and local knowledge.**



- 98 The recording of generic flatfish is an obstacle to the understanding and management of individual flatfish species within FLA 3. As previously noted, the flatfish catch is made up of a number of species and the problem lies in the fact that catches are often recorded as generic “flatfish” (and sometimes “flounder” or “sole”). This varies both spatially and temporally.
- 99 The fishery is mainly confined to the inshore domestic trawl fleet except for small incidental bycatch of sole, brill, and turbot by deepwater trawlers, and some localised set-netting. There were a total of 126 vessels that caught flat fish over the 2005-2006 season. Medium sized vessels, between 10 m to 46 m long are used to catch the majority of flatfish. The majority of these vessels are of domestic origin (99%), with the remainder chartered or unknown.

### *Recreational fishery*

- 100 Table 8 shows harvest estimates from the relevant recreational surveys.<sup>50</sup> 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).
- 101 The surveys that estimated a harvest range give 30-252 t, so a mid point for allocation is 150 t (see para 44).

**Table 7: 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	-	-	-	-
1996	National	113 000	13	30-50	40
1999-00	National	39 000	33	127-252	189.9
2000-01	National	284 000	17	-	136.7

### *Impacts of fishing*

- 102 No research has 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.
- 103 Flatfish set net fisheries could potentially represent a risk to the endangered west coast South Island Hector's dolphin. Some of these dolphins have been accidentally caught and killed in set nets. The TAC proposals are unlikely to lead to expansion of set net effort and, therefore do not increase any risk to the dolphins.

<sup>50</sup> 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.

104 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.

***Social, Cultural and Economic Factors***

*Customary importance*

- 105 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).
- 106 Pātiki (flounder) have traditionally been a popular food source since they can easily be caught by spear fishing. Submissions to the Waitangi Tribunal in the form of the Ngai Tahu Sea Fisheries Report (The Habib Report) 1988 noted that “Ngai Tahu certainly took four species of flounder, as well as brill (horoti), turbot (horo), lemon sole (patiki) and NZ sole (patiki rori and horihori).
- 107 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.

*Social importance*

108 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 6-10% of commercial catches.

*Economic importance*

109 Recent port prices for FLA 3 are shown in Table 8. National exports of sole species are around 800 tonnes a year, with a value of \$6 million in 2004. Flounder is also commonly sold on the domestic market. Landings from FLA 3 are around 45% of national landings.

**Table 8: Port price for FLA 3 (\$/kg)**

	2002	2003	2004	2005
FLA 3	4.5675	4.75	5.2609	2.96

**Table 9: National exports of Soles (Lemon and NZ) in 2005 and 2006. FLA 3 accounts for approximately 45% of national landings.**

Sole Lemon and NZ exports		2005		2006	
Type	Volume (kg)	Value (\$)	Volume (kg)	Value (\$)	
Chilled fillets	157	6	722	0	
Chilled headed and gutted	220	1,514	2,029	0	
Chilled whole	4,910	837	1,850	0	
Frozen fillets	43,687	2,503	144,388	317	
Frozen headed and gutted	20,770	13,727	18,265	25,406	
Frozen whole	717,676	345,575	733,710	287,032	
<b>Total</b>	<b>787,420</b>	<b>\$364,156</b>	<b>900,964</b>	<b>\$312,755</b>	

- 110 FLA 3 quota shares have generally traded for between \$3 and \$5 per kg over the last four years. ACE prices have commonly been in the range \$0.20 to \$0.40
- 111 The available ACE trading data suggests that there is an active market, with ACE available for most fishers to cover their catches.
- 112 By the end of the 2005-06 fishing year, most major quota holders had sold their ACE to other fishers.
- 113 The relatively low amounts paid in deemed values also suggest that ACE are readily available. The interim deemed value is set above the level of most ACE sales. The annual deemed value is set at \$1.50.

**Table 10: Deemed value payments in FLA 3, 2003-04 to 2005-06**

	Interim DV	Annual DV payment	Ramping (Y/N)	DV Payments		
				2003-04 (\$)	2004-05 (\$)	2005-06 (\$)
FLA3	0.75	1.50	Y	5,297	3,286	582

- 114 There are 83 quota holders in FLA 3 (as at 18 May 2007). Quota is generally held in small parcels. The maximum holding is 449 tonnes (17% of the TACC). There were 104 holders of ACE during the 2006-07 fishing year.

**Table 11: Local Coastal plans under the RMA 1991**

Regional council	Document	Status	Issues raised
Environment Canterbury	Regional Plan	Operational 2005	Coastal protection and wet land preservation
Otago Regional Council	Regional Plan Coast	Operational 2001	Identification coastal protection areas within FLA 3. These include several estuaries.
Environment Southland	Regional Plan	Operational 2007	Estuarine protection and water quality in discharges

**Table 12: Relevant management strategy or management plan under Conservation Act 1987**

<i>Area within FLA 3</i>	<i>Document</i>	<i>Expire date</i>	<i>Sustainability issues</i>	<i>Specific areas of concern</i>
Kaikoura Coast to the Conway River	Conservation Management Strategy Nelson Marlborough Conservancy	2006	The effect of fishing on natural marine ecosystems. Reduction of biodiversity by fishing. Effect of marine fishing on terrestrial ecosystems (dependent on nesting grounds of sea birds). Achieving integrated management of marine and terrestrial environment.	<i>Kaikoura Peninsula:</i> Internationally important habitat of dolphins and whales. Part of Peninsula deemed possible site for marine reserve. <i>Kaikoura Coast:</i> Important breeding and nursery area for marine mammals, fish and sea birds.
Canterbury Coastline Conway to Waitaki River	Conservation Management Strategy Canterbury Conservancy	2009	Over harvesting of marine ecosystems	<i>Motunau Island:</i> important nesting site for seabirds including white flippered penguins Banks Peninsula Canterbury Coastline
Otago's coastline from the Waitaki River to Waikawa	Conservation Management Strategy Otago Conservancy	2006	Over- fishing a threat to the food supply of a number of marine mammals and sea birds including: Hooker's sea lion, NZ fur seal, leopard seal, southern elephant seal, yellow eyed penguin, and south island shag.	

<i>Area within FLA 3</i>	<i>Document</i>	<i>Expire date</i>	<i>Sustainability issues</i>	<i>Specific areas of concern</i>
Eastern Otago, Southland and Fiordland coastline from Waikawa to Awarua Point.	Conservation Management Strategy Southland/West Otago Conservancy	2008	The effects of fishing on the marine environment, especially marine mammals and sea birds. In particular: Effect of removal of fish species (targeted and non targeted) on food chain; Destruction of habitat by fishing methods; and Importance of protecting representative and important marine environments.	<i>Porpoise Bay:</i> Important habitat for hectors dolphin, hooker's sea lions and yellow eye penguins. <i>Estuaries:</i> including Awarua Bay, Waituna Bay, New River Estuary, Toetoe Estuary: Important habitat for sea birds and marine mammals. Proposed RAMSAR sites. <i>Te Waewae Bay:</i> Southland's largest population of Hector's dolphin's <i>Solander Island:</i> Important habitat for sea birds and marine mammals, especially NZ fur seals and Bullers molly hawks. <i>Fiords:</i> Pristine aquatic environment with important communities of marine mammals, seabirds and coral.

<i>Area within FLA 3</i>	<i>Document</i>	<i>Expire date</i>	<i>Sustainability issues</i>	<i>Specific areas of concern</i>
Stewart Island and surrounding Islands	Conservation Strategy Stewart Island	2007	Diverse populations of seaweed, brachiopods, marine mammals, and seabirds.	Stewart Island Paterson Inlet Mutton Bird Islands
Sub Antarctic Islands	Sub Antarctic Islands	2008		

# FLATFISH (FLA 3) – SUMMARY OF SUBMISSIONS

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- 1 MFish received submissions on the FLA3 IPP from:
  - Araiteuru Customary Fisheries Regional Forum
  - Environment and Conservation Organizations of NZ Inc.(ECO)
  - Graham Fraser, fisherman Taieri Mouth
  - New Zealand Recreational Fishing Council (NZRFC)
  - Ngati Mutunga O Wharekauri Iwi Trust
  - Ocean Fisheries Ltd
  - Royal Forest and Bird Protection Society of New Zealand Inc.(Forest & Bird )
  - Sanford Ltd
  - South East Finfish Management Ltd (South East Finfish)
  - The New Zealand Seafood Industry Council Ltd (SeaFIC)
  - Talley's Ltd (Talley's)
  - Tasman and Sounds Recreational Fisher's Association (TASFISH)
- 2 **Araiteuru Customary Fisheries Regional Forum** generally supported the customary allowance of 5 tonnes. The members also acknowledged that often customary fishes used the recreational allowances to take fish.
- 3 **Environment and Conservation Organizations of NZ Inc.(ECO)** supports Option 3, which is a TACC set at the average of the last 5 years commercial landings, in a move toward MSY. ECO also proposes that the TAC should be split into the separate flatfish species.
- 4 **Graham Fraser Quota Owner and Fisherman** supports the status quo and comments that in the area that he fishes (Otago) there are no problems. In fact, he catches his quota every year. If there are any cuts to the TACC, his small business will become unviable and he will consider leaving the industry.
- 5 **New Zealand Recreational Fishing Council (NZRFC)** supports Option 4 as they believe that this will meet the requirements of Section 13 of the Act. The NZRFC recommends that joint stakeholder discussions are encouraged and resourced by MFish to address the problem of localised depletion. The NZRFC also submits that both MFish and the commercial fishery managers investigate the use of technology as used in the Southern scallop fishery to improve management and stakeholder conflict in the FLA3 fishery.

- 6 **Ngati Mutunga O Wharekauri Iwi Trust** supports a lowering of the TACC for FLA3 if research has shown that this is required to support the long term sustainability of these fish stocks. They also submit that Chatham iwi and the community should be given the opportunity to develop a flatfish fishery in a separate Wharekauri/Chathams Fisheries Management Area.
- 7 **Ocean Fisheries Ltd** does not support any reduction in the TACC for FLA 3. They strongly believe that the variability in landed catch is due to changing catch effort. Ocean Fisheries is also not confident that, if the TACC is reduced, there is a method for upward adjustment of the TACC without significant scientific evidence to support the increase.
- 8 **Royal Forest and Bird Protection Society of New Zealand Inc. ( Forest and Bird)** supports Option 3, which is to set the TACC at the average of the last 5 years commercial landings, in a move toward MCY estimate. Forest and Bird also proposes that the TAC should be split into the separate flatfish species. In addition, Forest and Bird want a set net ban in order for fishers to investigate alternative fishing methods for flatfish.
- 9 **Sanfords Limited** supports the reduction of the TACC to 1780 tonnes (Option 2 of the IPP). Sanfords believes this option will ensure sustainability, whilst providing for utilisation during years of high abundance without restricting harvest levels during these periods.
- 10 Sanfords also would like consideration to be given for the management of FLA 3 to be under Section 14 of the FA 96 (Third Schedule Species), providing for in-season adjustments.
- 11 Sanfords also notes that the recreational allowance as not proportionally reduced for each of the options. Sanfords strongly opposes this and states that the options should reflect proportionality, by equally reducing the recreational allowance for each of the TACC reductions proposed.
- 12 **The New Zealand Seafood Industry Council Ltd (SeaFIC)** believes that further work is required to address fundamental questions about the way in which the FLA 3 fishery is managed, ideally prior to any TACC adjustments. SeaFIC proposes that a full characterisation of the fishery would assist in clarifying the problem definition. SeaFIC notes that there are two potentially available approaches for managing highly variable stocks - either (1) a TACC can be set at a relatively low level, and provision made for years of higher abundance by way of in-season increases, or (2) a TACC can be set at a relatively high level and provision made for years of lower abundance by arrangements between quota owners to set aside “excess” ACE. SeaFIC does not support setting a lower TAC and making use of the in-season TACC increase mechanism under the Second Schedule. The IPP proposals rely on the use of in-season TACC increases to alleviate any constraints on utilisation caused by the reduced TACCs proposed in the IPP. However, the IPP contains no analysis of the potential costs of this approach.
- 13 **South East Finfish Management Ltd** supports Option 1 but does acknowledge that there is mixed opinion within the South East Finfish Ltd shareholders. They state that, within the shareholders, there is a general consensus that there needs to

be adjustment to the TACCs for FLA 3. In supporting Option 1, SE Finfish undertake to:

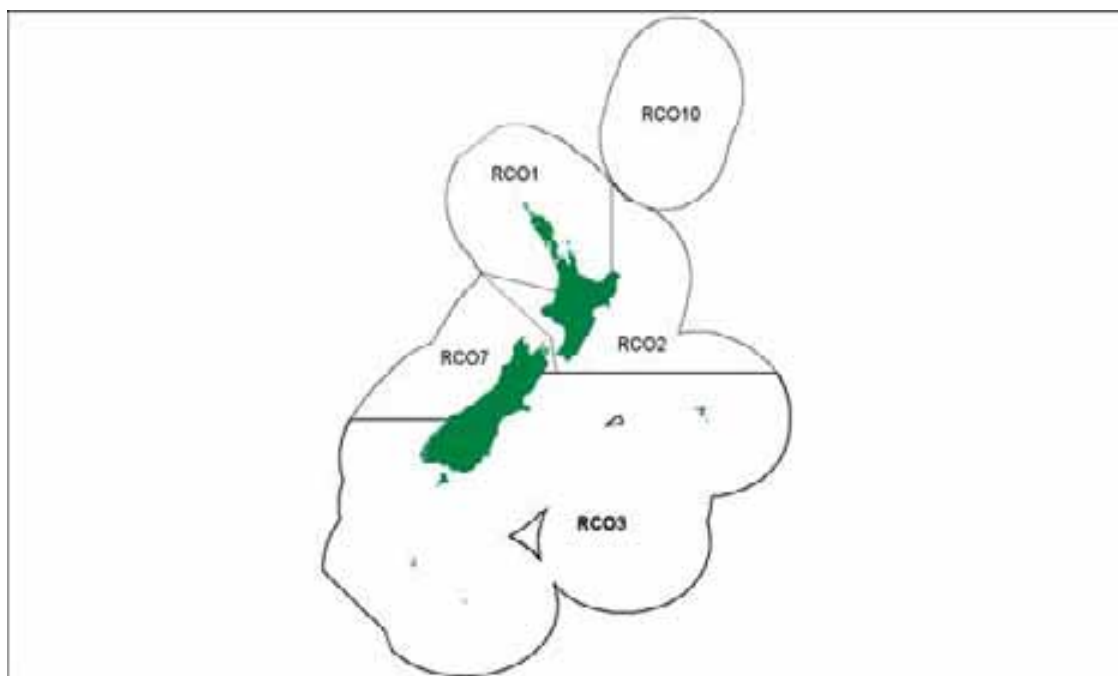
- provide economic data to support the fishery,
- complete a characterisation of the fishery,
- Analyse CPUE,
- work collaboratively with MFish on a specific Fish plan, and
- work with MFish to develop an in season decision rule for TACC increase under Schedule 2 of the Act.

- 14 If these proposals are achieved, South East Finfish would seek a negotiated TACC reduction in 2008.
- 15 **Talley's Ltd** supports Option 1 but notes that, if a reduction is decided, it is absolutely imperative that this occurs on the basis that FLA 3 is under schedule 2 of the Act and an in-season decision rule has to be developed. Talley's also strongly believes that consideration be given to the use of quota owners initiatives to withhold ACE from fisheries and spread effort to alleviate any localised abundance problems.
- 16 **Tasman and Sounds Recreational Fishers' Assn (TASFIH)** supports Option 4 as they believe this option meets the requirements of Section 13 of the Act. They have included in their submission that MFish should also reduce the TACC of FLA7 to below current catch rates for the same reason.

# RED COD (RCO 3) - INITIAL POSITION PAPER

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**Figure 4: Location of boundaries of the red cod (RCO) Quota Management Areas**



## Executive Summary

- 1 Red cod is a key target species within a complex of fished species in the Southern Inshore (trawl) Finfish Fishery (SIF fishery). Fishers target their operations around the inter-annual variation in the abundance of the species that make up this fishery complex.
- 2 Anecdotal information from all fishery sectors has raised concerns about the sustainability and utilisation of RCO 3 stocks off the east coast of the South Island. Commercial landings have declined substantially since the mid 1990s and recreational fishers consider some valuable local fisheries are lost.
- 3 The Minister of Fisheries has asked the Ministry of Fisheries (MFish) to review RCO 3 catch limits in response to these concerns. Currently, there is no Total allowable Catch (TAC) set for this fishery.
- 4 MFish believes that the current situation requires a review of the assumption that the fishery be managed at a level that is independent of biomass (because of the life history of red cod) and that reflects the inclusion of red cod on the Second Schedule of the Fisheries Act 1996 (the Act ). The Second Schedule allows for adjustment to the Total Allowable Commercial Catch (TACC) within a fishing year.

- 5 MFish believes that, on current available information, the RCO 3 biomass is below maximum sustainable yield (MSY) and requires rebuilding to a level that will support the MSY.
- 6 The most recent stock assessment (2001) is largely based on data which is now nine years old and which had followed an extended period of high landings. The Plenary considered that, if fully caught, the existing TACC is unlikely to move RCO 3 towards a level that could sustain the MSY. Red cod abundance is naturally variable (in relation to environmental variables) but the length and magnitude of the decline in commercial landings and recreational returns indicates fishing pressure may have significantly reduced spawning stock abundance.
- 7 In addition, the current substantial disparity between available catch and available Annual Catch entitlement (ACE) has created a “race for catch” fishery whereby there is (i) competition for access to local fishing grounds (ii) fishing in nursery areas (iii) discarding of non-marketable fish and bycatch and (iv) unnecessary sea bed damage caused by trawling for insignificant amounts of red cod. The disparity also distorts the ACE market. All these effects prevent RCO 3 fishers from using the resource efficiently in a sustainable way.
- 8 Red cod on the south-east coast lends itself to the provisions of the Second Schedule. An analysis of the recruitment-environment relationship shows there is a strong correlation between recruitment and environmental variables, with a 14 month lag. Further, the South-east coast trawl survey has recommenced this winter and will be able, in future years, to provide fishery independent information on the relative abundance of year class strength and recruitment into the fishery.

## Summary of Options

- 9 The following management measures are proposed for the RCO 3 fishery for the 2007-08 fishing year:

EITHER

- a) Option 1 - set a TAC of 13 299 tonnes for RCO 3 and within that TAC set:
  - i) a customary allowance of 5 tonnes;
  - ii) a recreational allowance of 280 tonnes;
  - iii) an allowance of 618 tonnes for other sources of fishing-related mortality; and
  - iv) a TACC of 12 396 tonnes.

OR

- b) Option 2 - set a TAC of 9 735 tonnes for RCO 3 and within that TAC set:
  - i) a customary allowance of 5 tonnes;
  - ii) a recreational allowance of 280 tonnes;
  - iii) an allowance of 450 tonnes for other sources of fishing-related mortality; and
  - iv) a TACC of 9000 tonnes.

OR

- c) c) Option 3 - set a TAC of 7 635 tonnes for RCO 3 and within that TAC set:
  - i) a customary allowance of 5 tonnes;
  - ii) a recreational allowance of 280 tonnes;
  - iii) an allowance of 350 tonnes for other sources of fishing-related mortality; and
  - iv) a TACC of 7 000 tonnes.

OR

- d) Option 4 - set a TAC of 4 930 tonnes for RCO 3 and within that TAC set:
  - i) a customary allowance of 5 tonnes;
  - ii) a recreational allowance of 95 tonnes;
  - iii) an allowance of 230 tonnes for other sources of fishing-related mortality; and
  - iv) a TACC of 4 600 tonnes, and
  - v) reduce the recreational daily bag limit for red cod in RCO 3 from 30 to 10.

The current TACC for RCO 3 is 12 396 tonnes. A TAC and other allowances have not yet been set for RCO 3.

10 The proposed management options are shown in Table 1.

**Table 2: The proposed TAC (tonnes), TACC (tonnes) and allowances for RCO 3 for the 2007-08 fishing year**

	Proposed TAC (tonnes)	Customary allowance (tonnes)	Recreational allowance (tonnes)	<i>Other sources of fishing-related mortality (tonnes)</i>	Proposed TACC (tonnes)
Option 1 (Proxy for <i>Status quo</i> )	13 299	5	280	618	12 396
Option 2 (TAC based on 25% reduction)	9 735	5	280	450	9 000
Option 3 (TAC based on average catch over last 20 years)	7 635	5	280	350	7 000
Option 4 (TAC based on average catch over last 5 years)	4 930	5	95	230	4 600

## Rationale for Management Options

### *Biological characteristics*

- 11 Red cod are a fast-growing, short-lived species with few fish in the commercial fishery older than six years. Recruitment is highly variable resulting in large variations in catches between years. To allow fishers to access stocks in years of high abundance, the TACC has traditionally been set at the highest catch levels. This management approach assumes that recruitment is effectively independent of biomass.

### *Stock status*

- 12 The most recent stock assessment (2001) and estimates of biomass and sustainable catch are largely based on data up to the end of the 1997-98 fishing year. The data used for this assessment is now nine years old.
- 13 Based on the historical data, the Plenary considered that, while a constant catch at the TACC level of RCO 3 was not attainable or sustainable in most years, biomass of RCO 3 appeared to be greater than the size that would support the BMSY. Based on current catches and anecdotal information from fishers, MFish considers that this may no longer accurately reflect the status of the fishery.
- 14 The stock assessment did estimate a Current Annual Yield (CAY) at 14 561 t, with a range of 2 624 t to 37 976 t. The Plenary considered this stock assessment to be uncertain.
- 15 The Plenary also considered that, if it were fully caught, the existing TACC (12 396 t) is unlikely to move RCO 3 towards a level that could sustain MSY.
- 16 Two estimates of Maximum Constant Yield (MCY), using two different methods, are available and are 4 400 t and 7 000 t. Landings over the seven year period from the 1992-93 fishing year until 1998-99 exceeded 8 000 t annually. Since that extended period of landings in excess of MCY estimates, landings have averaged 4 600 t and

declined to 3 222 t in the 2005-06 fishing year. Landings for the current fishing year are not expected to significantly exceed 1 500 t.

- 17 Both commercial and recreational fishers have expressed concern at the continued decline in the RCO 3 stock over the past seven years. Recorded landings at the time of writing (2/3 through the fishing year) are 906 t. This is an order of magnitude lower than the TACC. Even with the assumption that red cod stocks can respond positively from a low biomass, recent landings data reflect a trend of declining abundance and recruitment in RCO 3.
- 18 The sex ratio of the RCO 3 commercial catch sampled during the period 1989-90 until 1992-93 was skewed towards females during November (ratio F:M 3.4:1) with the ratio tending to even out by May. This implies that the fishery may be catching a predominance of breeding females.
- 19 Given current landings, as an indicator of current biomass, also suggest the available spawning stock may be low, a more conservative approach to management may be prudent. Future recruitment pulses may be smaller and there may be a need to protect the stock to allow the population to re-generate a significant pulse of recruitment.

### ***Existing catch limits***

- 20 The total allowable commercial catch (TACC) is 12 396 t.
- 21 The original TACC for RCO 3 was set at a high level, based on 1983 catch levels that were the highest on record at that time. Since 1986, the TACC was increased from 9 000 t to 12 396 t by quota appeals. The TACC was intended to allow high levels of commercial catch in years of high abundance. However, the TACC has only been caught three times over the last 25 years and it is substantially above the level of current catches. The Plenary concluded that if it were fully caught, the existing TACC is considered unlikely to move RCO 3 towards a level that could sustain the MSY.
- 22 Given this, MFish considers it unlikely that a TAC incorporating the current TACC (as well as allowances for recreational catch, customary catch and other sources of fishing-related mortality) would move RCO 3 towards a level that would support the MSY. A TAC needs to be set that is more likely to fulfil the obligation to move RCO 3 towards the level that can produce the MSY.
- 23 MFish considers the decline in landings indicates the best value is not being achieved from this fishery. MFish is also concerned that the high TACC set for RCO 3 means that, in most years, there is effectively an “open access fishery” as there is significantly more ACE available than realizable catch. This creates a number of anomalies including a “race for catch” rather than efficiently fishing to obtain the best value. The outcome includes competition for access to local fishing grounds, fishing in nursery areas, and discarding of non-marketable fish and bycatch.
- 24 The vast majority of red cod is caught by trawl. As RCO 3 is a component of the SIF fishery, there are a number of QMS stocks that are taken as an unavoidable bycatch of trawling for red cod. Section 13(2) notes that, when setting a TAC, the Minister shall have regard to the interdependence of stocks. Changes in catch rates of red cod, combined with the recovery of other quota species since the introduction of the QMS,

have resulted in a catch mix for which some fishers do not have the appropriate quota holdings. Bycatch problems while targeting red cod are therefore common for stargazer, red gurnard, elephant fish, rig, school shark, blue cod, groper and tarakihi.

- 25 MFish considers that three of the proposed TAC options will move to alleviate bycatch issues associated with the interdependence of stocks and the RCO 3 fishery.
- 26 The open access fishery and race for catch also results in distortions in the ACE market for interdependent stocks where catches of bycatch species may be optimised during years of low red cod abundance. Higher catches of bycatch species leads to over-catching these stocks and discarding as ACE for those stocks become more difficult to procure.

### ***Other factors***

- 27 As mentioned, the TACC for RCO 3 was set at the historical highest catch levels to allow fishers to take advantage of high abundance years. This management strategy was set when RCO 3 was put into the QMS in 1986, prior to the current Act. MFish consider this historical provision is no longer necessary to access catch during years of high abundance as red cod is on the Second Schedule of the Act to allow for within fishing year TACC increases.
- 28 The Second Schedule can apply to any stock whose abundance may vary significantly 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 the MSY.
- 29 Red cod on the south-east coast lends itself to the provisions of the Second Schedule as an analysis of the recruitment-environment relationship shows there is a strong correlation between recruitment and environmental variables, with a periodic 14 month lag. Further, the South-east trawl survey has recommenced this winter and will be able, in future years, to provide fishery independent information on the relative abundance and year class strength and recruitment into the fishery.
- 30 MFish notes that it is currently consulting on a proposal to increase the squid TAC (TAC set under s14, and on the Third Schedule of the Act; refer Initial Position Paper with this document). The fishery and biological characteristics of red cod and squid are sufficiently different to warrant different management approaches. Red cod is longer lived than squid and, while the abundance of red cod varies, it does so over longer time periods and at a smaller scale than squid. Red cod is also a shared fishery and recreational fishers are finding that what was once an abundant and accessible species is now an uncommon catch under current management.

## Assessment of Management Options

### *Setting a TAC*

- 31 The Minister is obliged, under section 13 of the Act, 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.
- 32 MFish proposes to set the TAC for RCO 3 using s 13 of the Fisheries Act 1996.
- 33 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 RCO 3 because:
- a) it is possible to estimate the MSY 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.
- 34 The Minister of Fisheries must set a TAC under s 13 that:
- a) Maintains the stock at or above a level that can produce the MSY; or
  - b) Enables any stock that is currently below a level that can produce the MSY to be restored to a level at, or above, that which can produce the MSY; or
  - c) Enables the level of any stock currently above the MSY to be altered in a way and at a rate that will result in the stock moving towards the MSY.
- 35 MFish considers that the most current available information indicates that the existing TACC for RCO 3 is not moving the stock towards MSY and there are indications that the stock is in decline. While red cod is known to have highly variable recruitment, MFish is concerned that, on the available information, RCO 3 may require some considerable time to recover from the current down turn in the fishery and a period of rebuild is necessary.
- 36 Therefore, MFish proposes to set a TAC under s.13(2)(b) of the Act, taking into account interdependence of stocks in the SIF fishery.
- 37 In determining the way and rate at which the stock should be moved to a level that can support MSY, MFish has little information on the social, cultural and economic considerations of this fishery must be taken into account. MFish welcomes further information from submitters on these matters relating to the following TAC proposals.

### *Proposed TAC options*

- 38 All options are based on RCO 3 being on the Second Schedule of the Act and, therefore, open to within fishing year TACC increases:
- Option 1 – A proxy *status quo*. This option is based on the 2001 Plenary report that the stock is above  $B_{MSY}$ . This option incorporates estimates of recreational catch, customary catch and other sources of fishing-related mortality as a constant factor during the period without a TAC and estimates have been added to the TACC.
  - Option 2 - TAC based around a 25% reduction to the TACC to move the TAC towards  $B_{MSY}$ , as Plenary considered that, if fully caught, the existing TACC is unlikely to move RCO 3 towards a level that could sustain the MSY. The TAC also incorporates estimates of recreational catch, customary catch and other sources of fishing-related mortality;
  - Option 3 – TAC based on the most recent 20-year average of commercial catches, plus estimates of recreational catch, customary catches and other sources of fishing-related mortality;
  - Option 4 - TAC based on the most recent 5-year average of commercial catches, plus estimates of recreational catch, customary catch and other sources of fishing-related mortality.

### *Recreational catches*

- 39 It is proposed that 280 tonnes be used as the estimate for recreational catch as an input for calculating the TAC for all options, except for Option 4 where recreational catch has been reduced by two thirds, effected by a reduced recreational daily bag limit of 10. In this regard, MFish would appreciate information from recreational submitters on the value of the fishery to them.
- 40 Surveys of recreational fishing in 1992-94, 1996, 1999-00, and 2000-01 provide estimates of the recreational harvest of red cod in RCO 3. The estimates from the 1999-00 and 2000-01 surveys are very similar, and are considered the best available information about recreational take. These surveys estimate recreational red cod take in RCO 3 to be approximately 280 t and 207 t. The Plenary favoured the 2000 survey of 280 t.
- 41 The 1999-00 recreational survey estimates have relatively large ranges (210-349 tonnes in the 1999-00 survey and 189-352 tonnes in the 2000-01 survey). MFish considers it is more appropriate to use the mid-point of the 1999-00 survey as an estimate of recreational catch, rather than an alternative value such as the upper limit of the harvest estimate.

### *Customary Maori catches*

- 42 It is proposed that a nominal 5 t be used as the estimate for customary Maori catch as an input for calculating the TAC. The same estimate is proposed for all options.
- 43 There are no records of customary take of red cod in RCO 3. Customary landings are managed by Tangata tiaki under Customary Regulations. Tangata tiaki have been

appointed for FMA 5 and most of FMA 3 and they provide the permits for all customary take in the area. These permits describe the quantity and species of fish that can be taken and the purpose of the customary permit. No customary permits have been issued for red cod in RCO 3. Harvesting by tangata whenua is, therefore, assumed to be taken under the recreational catch. Therefore, a nominal customary allowance of 5 t is provided. Further information from submitters is keenly sought to ensure the customary allowance satisfactorily provides for customary catch.

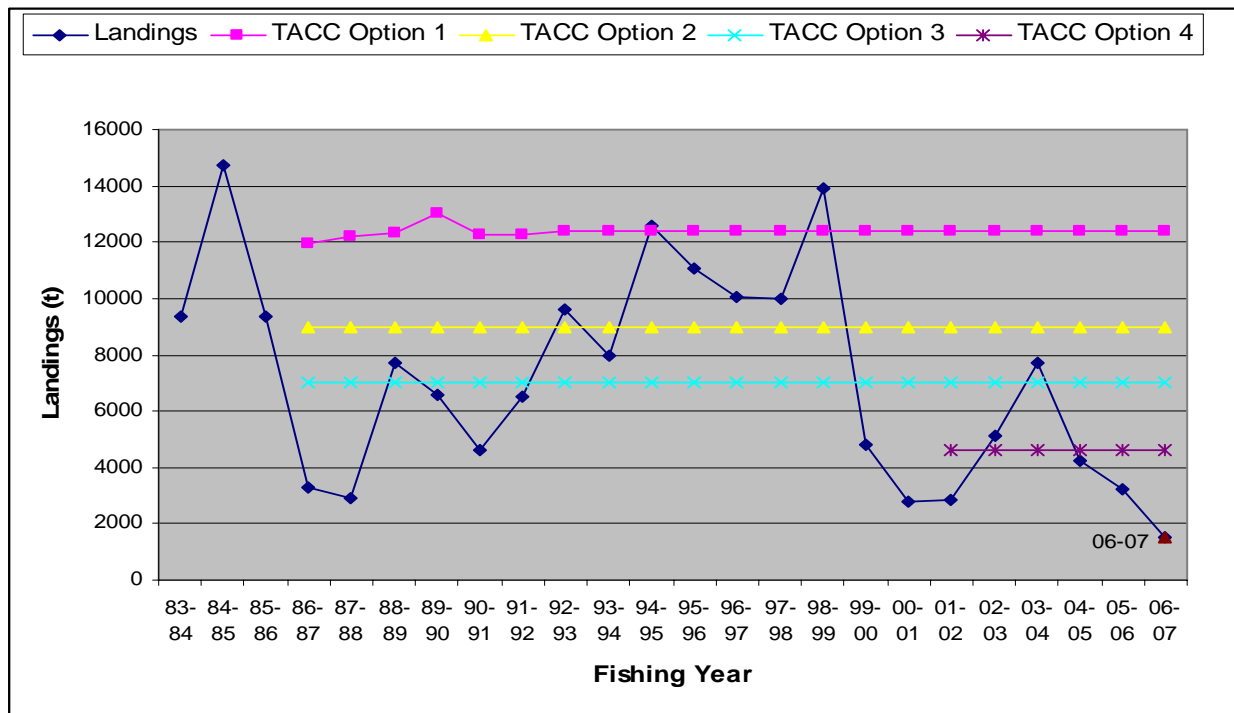
### *Estimate of other sources of fishing-related mortality*

- 44 MFish proposes to include an estimate of 5% of the proposed TACCs for other sources of fishing-related mortality for RCO 3. No allowance is currently set but there are various potential sources of fishing-related mortality in RCO 3, including:
- Red cod have a minimum legal size limit of 25 cm. Red cod are soft fleshed and survival of returned undersized fish from the trawl fishery is thought to be low;
  - Red cod 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. In times of high abundance, the significant price differential between the small grade (600 g) and larger fish (800 g) provides an incentive for high grading.
  - The extent of any illegal catch of red cod for commercial sale is unknown but considered unlikely to occur.

### *Commercial catches*

- 45 The potentially high natural variability of red cod is acknowledged by the inclusion of red cod on the Second Schedule of the Act. Inclusion of red cod on the Second Schedule has been taken into account when providing the TAC options. TACCs under the TAC options are as follows:
- a) Option 1 – *Status quo* (12 396 t).
  - b) Option 2 - 25% adjustment to commercial landings (9 000 t)
  - c) Option 3 – Average commercial landings over 20 years (7 000 t)
  - d) Option 4 – Average commercial landings over the last five years (4 600 t)

**Figure 2: Landings, current TACC and proposed TACCs.**



Note:- 06-07 To illustrate the current state of the fishery, a projected figure of 1500 t has been used for the current 06-07 fishing year.

### Option 1

- 46 Option 1, the proxy Status quo, proposes a TAC of 13 299 t, including a TACC of 12 396 t. This option supports the assumption that red cod can be fished as hard as is economically necessary every year and that their natural fecundity will ensure their plentiful abundance into the future.
- 47 MFish considers that this historical approach has a number of disadvantages to achieving best value from the fishery that also extend to inevitable bycatch species. It is possible that this management approach to the fishery also contributes to a boom or bust productivity from the fishery which will compromise marketing continuity and obtaining best value from the fishery. As expressed earlier in the paper, based on the current landings, MFish has concerns about the ability of the existing spawning biomass to respond to current fishing pressure and believes that precaution should be adopted with this fishery under the current situation.
- 48 Option 1 will meet the Minister’s obligation to set a TAC and ensure full access to the fishery in years of high abundance. MFish does not believe this option will meet the Minister’s obligations under s 13 of the Act given the statement from the Plenary that if it were fully caught, the existing TACC is considered unlikely to move RCO 3 towards a level that could sustain the maximum sustainable yield (MSY).
- 49 Under this option there are no expected economic changes.

### ***Option 2***

- 50 Option 2 proposes to use the same estimates for customary and recreational catch, and the same proportion to estimate other sources of fishing-related mortality.
- 51 Option 2 proposes a TACC reduction of 25%, down to 9 000 t for the commercial fishery, and 450 t for other sources of fishing related mortality (5%).
- 52 At a TACC of 9 000 t, over the last 20 fishing years, catch would have been restrained on 30% of these fishing years. The average recorded landings over the last 20 fishing years is 6 848 t.
- 53 This TAC option is higher than past catches have been in most years. Given current catch levels, the socio-economic effects are not likely to be significant into the medium term. Because most of the RCO 3 catch is targeted, fishers would probably be able to adjust their activities without exceeding the TAC.

### ***Option 3***

- 54 Option 3 proposes a TACC of 7 000 t for the commercial fishery and 350 t for other sources of fishing-related mortality (5%). This option is slightly above both the 10 and 20 year average recorded landings, being 6 407 t and 6 848 t, respectively. Under this option, catch would have been constrained in 45% of fishing years over the last 20 years. Catch has only once slightly exceeded 7 000 t (7 724 t) within the last seven years. This option also corresponds well with the MIAEL estimation of MCY (7 173 t) given in the Plenary document.
- 55 Should abundance eventually rise significantly, within fishing year adjustments would be available under the Second Schedule provisions, if appropriate. Therefore, this option would not constrain the fishery overly as there is always recourse to the Second Schedule. It could, however, restrict the use of RCO 3 ACE as a proxy to target other SIF fishery species, and reduce any discarding when ACE was thought to be difficult to obtain. This option could reduce the distortions associated with an unrestrained access to the fishery.
- 56 MFish considers that this option is likely to constrain fishing effort and ensure more constant sustainable stocks. This option would probably constrain further new entrants into the fishery.

### ***Option 4***

- 57 Option 4 proposes a TACC of 4 600 t for the commercial fishery and 200 t for other sources of fishing-related mortality (5%). This option better reflects the current state of the fishery over the last five years and is slightly above the Yav estimation of MCY (4 400 t). This option is supported by recreational fishers, especially from the Canterbury/Banks Peninsula area, who consider the recreational fishery for “the renowned Akaroa cod” to have been deteriorating since 1996 and to be now, effectively, non-existent.
- 58 Under current landings, this option will have little impact on fishers as it is still above the current catch. This option may have economic impacts on smaller quota holding fishers who would no longer have an appropriate quota mix or economic parcel of RCO 3 ACE should they encounter quantities of red cod.

- 59 This option would also make a smaller allowance for recreational fishers – to be effected by a reduction of the recreational daily bag limit. Recreational fishers are supportive of this measure as they consider it is in the best interests of the fishery.

### ***Economic impacts***

- 60 RCO 3 has a relatively low commercial value, with a port price of \$0.59 per kg in 2006. RCO 3 quota trades at a low amount, generally \$2 - \$2.50 per kg.
- 61 Technically, any reduction in the TACC will mean an ‘opportunity cost’ for commercial fishers no longer being able to catch up to the current commercial catch limit. On the other hand, under current landings, there will be no actual financial impact on fishers under any of the options put forward for consultation. Based on previous landings trends, any rise in landings is likely to be a steady increase. Current landings would suggest that spawning biomass will be equally low and that any significant recruitment pulse could be some years away.
- 62 Because RCO 3 is listed on the Second Schedule, there is provision for an in-season increase to the TAC (under s 13(7)). This provision would mitigate lost opportunity costs because catches could be increased during years of high abundance. Using this provision would require a pre-recruit survey or some other way of assessing abundance.
- 63 Most of the RCO 3 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. If the commercial catch limit is reduced, 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.
- 64 However, because ACE will become scarcer, the price is likely to increase above the current level of \$0.0738 per kg. This increase is likely to affect the profitability of some individual fishing operations.
- 65 Conversely, quota holders may benefit over the medium term because quota prices may increase.
- 66 Significant reductions in the TACC may impact on the value of quota share holdings. But, previous experience in fisheries has indicated that the inherent value of a fishery is already established and that the value of quota responds to adjustments accordingly.
- 67 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***

- 68 Red cod is an important recreational fish species, especially in the Canterbury region. Recreational fishers from this region have expressed serious concerns about the state of the RCO 3 fishery. They find that what was once one of the more abundant and

accessible species is now an uncommon or incidental catch. Consequently, recreational fishers favour that course of action most likely to quickly rebuild the fishery and have volunteered a 2/3rd reduction in their daily bag limit of red cod if option 4 is favoured.

- 69 There is an attendant cultural cost for recreational fishers being unable to access their fishery.
- 70 Non-commercial fishers cannot use the bulk harvesting methods that commercial fishers use. The high level of the current TACC may increase the likelihood that commercial fishers preferentially catch available red cod. This situation is likely to be particularly apparent in years of lower red cod abundance.

## **Other Management Controls**

### ***Deemed value***

- 71 Stocks that are being considered for a TACC review as part of the October 2007 sustainability round are also being included in a deemed value review process. This is to ensure that, in situations when a TACC is adjusted, the deemed value is also set at an appropriate level to defend the new TACC. MFish considers that if the TACC is reduced then deemed value rates should increase so that they adequately protect the new TACC. The current annual deemed value rate (\$0.32 per kg) is set below both the port price (\$0.54 per kg) and average export price (\$3.58 per kg). MFish proposes to increase the annual deemed value rate so that it better reflects the current port price. Differential deemed value rates will also change in line with the proposed annual deemed value rate. The proposed deemed value rates for the 2007-08 fishing season are as follows:
- a) Annual deemed value rate to increase from \$0.32 per kg to \$0.50 per kg.
  - b) Interim deemed value rate to increase from \$0.16 per kg to \$0.25 per kg, which is 50% of the new annual deemed value rate.
  - c) Differential deemed value rates adjusted to reflect the proposed new annual deemed value rate, outlined in the table below.
- 72 These proposed deemed value adjustments are dependant on a TACC decrease, if this is not approved by the Minister then MFish considers the deemed value rates should remain unchanged.

### ***Recreational daily bag limit***

- 73 Under option 4, the South Recreational Marine Fishers Advisory Committee has volunteered to reduce the red cod recreational daily bag limit from 30 to 10 per day. This reduction has been put forward to assist in rebuilding the resource and underlines the recreational sector's deep concern for the current state of the fishery.

## **Statutory Considerations**

- 74 In forming the management options for RCO 3, 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 red cod abundance is uncertain, MFish has provided a range of options consistent with the Act's purpose. Options aim to provide for use while ensuring sustainability.

- b) The TAC set under s 13 should be set at the level that can produce the MSY, or it should move the stock towards that level. As noted, there is uncertainty about where RCO 3 is in relation to the level that can produce the MSY. Because of this uncertainty, four TAC options are proposed. MFish considers, on the information available, that options 2, 3, and 4 are more likely to move the stock towards a level that can produce the MSY.
- c) The proposed TAC options have also taken into account the following factors:
  - i) Red cod 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 the MSY (as discussed in s 13(2)(b)(ii) of the Act).
  - ii) The *biological* characteristics of red cod have been considered when proposing options for the TAC (as required under s 13(2)(b)(ii)).
  - iii) The vast majority of red cod is caught by trawl. As RCO 3 is a component of the SIF fishery, there are a number of QMS stocks that are taken as an unavoidable bycatch of trawling for red cod. Section 13(2) notes that, when setting a TAC, the Minister shall have regard to the *interdependence of stocks*. Changes in catch rates of red cod, combined with the recovery of other quota species since the introduction of the QMS, have resulted in a catch mix for which some fishers do not have the appropriate quota holdings. Bycatch problems while targeting red cod are, therefore, common for stargazer, red gurnard, elephant fish, rig, school shark, blue cod, groper and tarakihi. As a result, effort into targeting red cod may be reduced to alleviate bycatch problems, despite the availability of red cod quota.
  - iv) MFish considers that three proposed TAC options will move to alleviate bycatch issues associated with the interdependence of stocks and the RCO 3 fishery.
- d) Social, cultural 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 the MSY (s 13(3)). MFish has identified differing social and economic consequences of altering the TAC and TACC under the four 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 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. All options are 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 South Island east coast where endangered Hector’s dolphin have been caught in commercial trawl nets. To manage this risk, a code of practice and regulations have been put in place in areas of concern within RCO 3. The proposed TAC options will not result in effort increasing but, rather, decreasing and risk to seabirds and marine mammals from trawling for red cod will decrease accordingly.
- 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. Because no increase in fishing effort is anticipated, it is not expected that any 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 RCO 3 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 RCO 3 to promote policies that help to recognise customary use and management practices. This paper has identified a lack of information on the level of harvest and the importance of red cod fisheries to customary fishers in RCO 3. Further information on this topic would be welcomed.
- l) Existing control measures have been considered when making recommendations for any change to measures used to control the RCO 3 fishery (as outlined in s 11(1)(b)).
- m) No relevant fisheries plan has been approved under s 11(2A)(b) of the Act.
- n) MFish has considered relevant conservation services and 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. If the fishery moves to a CAY strategy, then development of an appropriate management mechanism or decision rule may be required.

- 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). There 3 Regional Councils and one Territorial Local Authority in the RCO 3 QMA. These are Canterbury, Otago and Southland Regional Councils and the Chatham Islands Territorial Authority. Conservation Strategies exist for the Chatham Islands, Canterbury, Otago, Southland, Stewart Island and the Sub-Antarctic Islands.
- p) **Fiordland (Te Moana o Atawhenua) Marine Management Act 2005:** In recognition of the Fiordland (Te Moana o Atawhenua) Marine Area's local, national, and international importance, unique marine environment, distinctive biological diversity, and outstanding landscape and cultural heritage, the Government passed the Fiordland (Te Moana o Atawhenua) Marine Management Act 2005 (the 2005 Act).
- q) The purpose of the 2005 Act includes establishing the Fiordland Marine Guardians to provide advice on fisheries management, biosecurity, sustainable management, and marine preservation and protection. The 2005 Act also seeks to facilitate and promote co-operation between the Guardians and management agencies, to assist in achieving the integrated management of the Fiordland Marine Area.
- r) Section 12 of the Act establishes the Fiordland Marine Guardians. Section 13 of the 2005 Act states that the functions of the Guardians are, *inter alia*, to advise and make recommendations to management agencies and Ministers who exercise functions under specified enactments (including the Fisheries Act), to achieve the purpose of this Act. This includes, but is not limited to, advice and recommendations on the effectiveness of management measures in the Fiordland (Te Moana o Atawhenua) Marine Area.
- s) The 2005 Act goes on to state in s 26 that all management agencies exercising powers or carrying out functions in the Fiordland (Te Moana o Atawhenua) Marine Area must take into account any advice or recommendations provided by the Guardians (this includes powers and functions under the Fisheries Act 1996).
- t) RCO 3 includes the Fiordland coast and the Ministry will seek specific comment from the Fiordland Marine Guardians on the proposals.
- u) The nature of the fishery and the interests of each fishing sector have been considered in proposing the TACC and allowances for customary and recreational interests and other sources of fishing-related mortality (sections 21(1)(a and b), 21(4)(i and ii) and 21(5)). There are currently three mātaītai reserves and a taiapure within RCO 3. There is also a 186B

rāhui closed area at Kaikoura. These areas have been identified for customary fishing purposes in RCO 3, but the closures do not materially affect red cod fisheries. No restrictions have been placed on recreational fishing in any area within the QMA under s 311 of the Fisheries Act.

- v) Section 10 sets out information principles that are to be taken into account when setting TACs.
- w) The best available information on the status of RCO 3 is the Report from the Fisheries Assessment Plenary, May 2006: stock assessments and yield estimates compiled by the Ministry of Fisheries Science Group, May 2006.

75 MFish has used the surveys of recreational fishing in 1999-00, and 2000-01 as the basis for estimates of recreational catch in RCO 3. 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. MFish is also mindful that there are qualitative components to the recreational red cod fishery in RCO 3.

## Future Management

76 Three of the proposed allocations under a new TAC will reduce the current TACC. MFish requests feedback from stakeholders on the proposed options.

77 Should the fishery move to a CAY strategy using the Second Schedule of the Act, the development of a decision rule or management mechanism to anticipate pre- or within-season TACC adjustments may be required. It is envisaged at this stage that such a mechanism would be based on data generated by the south-east coast trawl survey and the recruitment-environment relationship.

78 The fishery could be closely monitored to determine the social and economic results of any reduction, as well as for 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;
- anecdotal evidence about the impact of any change implemented.

79 MFish will undertake further surveys to determine levels of recreational catch, including that for RCO 3. MFish would also welcome submitters providing further information on the social and customary importance of red cod.

## Preliminary Recommendations

80 MFish proposes that for the 2007-08 fishing year:

EITHER

- a) Option 1 - set a TAC of 13 299 tonnes for RCO 3 and within that TAC set:

- i) a customary allowance of 5 tonnes;
- ii) a recreational allowance of 280 tonnes;
- iii) an allowance of 618 tonnes for other sources of fishing-related mortality; and
- iv) a TACC of 12 396 tonnes.

OR

- b) Option 2 - set a TAC of 9 735 tonnes for RCO 3 and within that TAC set:
  - i) a customary allowance of 5 tonnes;
  - ii) a recreational allowance of 280 tonnes;
  - iii) an allowance of 450 tonnes for other sources of fishing-related mortality; and
  - iv) a TACC of 9000 tonnes.

OR

- c) c) Option 3 - set a TAC of 7 635 tonnes for RCO 3 and within that TAC set:
  - i) a customary allowance of 5 tonnes;
  - ii) a recreational allowance of 280 tonnes;
  - iii) an allowance of 350 tonnes for other sources of fishing-related mortality; and
  - iv) a TACC of 7 000 tonnes.

OR

- d) Option 4 - set a TAC of 4 930 tonnes for RCO 3 and within that TAC set:
- i) a customary allowance of 5 tonnes;
  - ii) a recreational allowance of 95 tonnes;
  - iii) an allowance of 230 tonnes for other sources of fishing-related mortality; and
  - iv) a TACC of 4 600 tonnes.
  - v) Reduce the red cod recreational daily bag limit in FMAs 3 & 5 from 30 to 10 per day.

# ANNEX 1

## Fishery Information

### *Biological Characteristics*

#### *Productivity and natural variability*

- 81 Red cod (*Pseudophycis bachus*) are a fast-growing, short-lived species with few fish in the commercial fishery older than six years. Red cod grow to about 25 cm total length (TL) in the first year, followed by annual growth increments of around 15, 10 and 5 cm. Growth of sexes is similar for the first two years, after which females tend to grow faster than males and reach a larger overall length. Sexual maturity ranges from 45 to 55 cm TL with a mean value of 52 cm TL for both sexes at an age of 2–3 years.  $M$  has been estimated to equal 0.76 for both sexes.
- 82 In the 1989–90 to 1992–93 fishing years, 80% of the landings in RCO 3 were 2+ and 3+ fish (50–57 cm TL). The sex ratio of the commercial catch during this period was skewed towards females during November (ratio F:M of 3.4:1) with the ratio tending to even out by May. Schools generally comprise single age cohorts rather than a mix of age classes.
- 83 Spawning in red cod varies with latitude, with spawning occurring later at higher latitudes. In the Canterbury Bight, spawning occurs from August to October. No definite spawning grounds have been identified on the southeast coast, but there is some evidence that red cod spawn in deeper water (>300–750 m). Running ripe fish were caught on the Puysegur Bank in 600 m during the Southland trawl survey in February 1994. Juvenile red cod are found in offshore waters after the spawning period; but no nursery grounds are known for this species.
- 84 Red cod are seasonally abundant, with schools appearing in the Canterbury Bight and Banks Peninsula area around November. These schools are feeding aggregations and are not found in these waters after about June. Catch data indicates that they move into deeper water after this time. Recruitment is highly variable resulting in large variations in catches between years.

#### **Estimates of biological parameters for red cod.**

<b>Fishstock</b>	<b>Estimate</b>				<b>Source</b>	
<b>1. Natural mortality (M)</b>						
RCO 3	0.76				Beentjes (1992)	
<b>2. Weight = a (length)<sup>b</sup> (Weight in g, length in cm fork length)</b>						
	<b>Females</b>		<b>Males</b>			
RCO 3	a = 0.0074	b = 3.059	a = 0.0145	b = 2.892	Beentjes (1992)	
<b>3. von Bertalanffy growth parameters</b>						
	<b>Females</b>			<b>Males</b>		
	<b>K</b>	<b>t<sub>0</sub></b>	<b>L</b>	<b>K</b>	<b>t<sub>0</sub></b>	<b>L</b>
RCO 3	0.41–0.03	76.5		0.47	0.06	68.5
						Horn (1995)

**Table 2: Key Biological Variables for Red Cod.**

Species	Natural mortality rate (M)*	Fecundity*	Maturity length and Age	Maximum age	Growth	Nursery Areas	Main depth distribution
<b>Red cod</b>	<b>Very high</b> 0.76	High	50 cm/2yr	6	Fast	>300m	<200m

### *Catch Information*

#### *Commercial fishery*

- 85 Red cod catch fluctuates from year to year reflecting changes in abundance as recruitment varies. The red cod caught are usually two and three year fish.
- 86 Red cod was introduced into the QMS in 1986. The TACCs set for red cod in 1986 were set at the highest historic catch level to enable fishers to take advantage of the available catch when these stocks were plentiful.
- 87 Quota appeals, based on commitment and dependence, further increased the TACC by 27 %. Reduction of the TACCs to the highest historic catch level before 1991 would have required compensation, but does not now.
- 88 Annual red cod catches for RCO 3 range from 14 751 t in 1984–85 down to 2 776 t in 2000–01.

**Table 3 Reported landings (t) of red cod in RCO 3 from 1983–84 to 2005–06 and TACcs (t) from 1986–87 to 2005–06**

<b>Fishing year</b>	<b>Catch landings (t)</b>	<b>TACc</b>
1983-1984	9 357	-
1984-1985	14 751	-
1985-1986	9 346	-
1986-1987	3 300	11 960
1987-1988	2 878	12 182
1988-1989	7 732	12 362
1989-1990	6 589	13 018
1990-1991	4 630	12 299
1991-1992	6 500	12 299
1992-1993	9 633	12 389
1993-1994	7 977	12 389
1994-1995	12 603	12 389
1995-1996	11 038	12 389
1996-1997	10 056	12 389
1997-1998	9 972	12 389
1998-1999	13 926	12 389
1999-2000	4 824	12 389
2000-2001	2 776	12 389
2001-2002	2 862	12 396
2002-2003	5 107	12 396
2003-2004	7 724	12 396
2004-2005	4 211	12 396
2005-2006	3 222	12 396

89 Most of the catch in RCO 3 is targeted by bottom trawl.

## RED COD (RCO 3) – SUMMARY OF SUBMISSIONS

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- 1 MFish received submissions on the red cod (RCO 3) IPP from:
  - Environment and Conservation Organisations of New Zealand Inc. (ECO)
  - New Zealand Recreational Fishing Council (NZRFC)
  - Ocean Fisheries Limited and Ocean Fisheries Quota Holding Company Limited (Ocean Fisheries)
  - Sanford Limited (Sanford)
  - South East Finfish Management Limited (SE Finfish)
  - Talleys Group Limited (TGL)
  - The New Zealand Seafood Industry Council Limited (SeaFIC)

### **Talleys Group Limited (TGL)**

- 2 TGL submit they own approximately 23% of the quota shares in RCO 3 and employ 25 boats to fish all of FMA 3 and 5.
- 3 TGL acknowledge that the RCO 3 TACC has not been caught but do not believe the TACC should be significantly reduced.
- 4 TGL submit that the abundance of red cod is recruitment and environmentally driven, fishing having little if any effect on the stock size.
- 5 TGL submit the problem is not stock abundance but a lack of active management by stakeholders. Consideration needs to be given to the use of Quota Owners initiatives to withhold excess ACE and spread effort to alleviate any localised abundance problems.
- 6 TGL support the Fisheries Plan model as the best course of action. An appropriate management regime should be agreed by all before any TACC cut or alternative management measures including closing juvenile grounds, mesh sizes and rotational closures.
- 7 TGL submit that in any case no TACC cuts should occur without knowing they are supported by a mechanism for implementing any “in season” adjustments to the TACC.
- 8 TGL support Option one with immediate dialogue with all stakeholders to develop a suitable process into the future.

## **South East Finfish Management Ltd (SE Finfish)**

- 9 South East Finfish Management Ltd submit it is a limited liability company incorporated as a commercial stakeholder organisation (CSO) in 1998 for the purpose of representing owners of individual transferable quota (ITQ) for inshore finfish stocks based primarily in Fisheries Management Areas (FMAs) 3 and 5 that encompass the east, south and southwest coast of the South Island. The company represents approximately 55,000 tonnes of quota covering 59 fishstocks. The company's shareholders own in aggregate approximately 94% of all quota in those stocks.
- 10 SE Finfish has concerns regarding the management of both the FLA3 and RCO3 fisheries and SE Finfish note that there is mixed opinion within the SE Finfish shareholders. The views as to the actions that should be taken to address these concerns are varied.
- 11 There is a general consensus that there needs to be adjustment to the TACCs for both FLA3 and RCO3, however, the question is whether these concerns are sufficiently urgent to require immediate action by way of options 2, 3 and 4 for both stocks in the IPP.
- 12 SE Finfish supports Option 1 with a commitment from the company to work with the Ministry to introduce more appropriate management processes for introduction on 1 October 2008.
- 13 SE Finfish submits that the current management for this fishstock needs to be reviewed but that, in the meetings between the Ministry and the company, the discussion has been directed at better management processes rather than immediate and significant TACC reductions. The focus of discussions has been on the development of a South East Inshore Fisheries Plan, the plan to be developed and implemented collaboratively between the Ministry and the company.
- 14 SE Finfish submit it considers a broad management review needs to be undertaken of the fishery. RCO 3 has a very large QMA that covers a very wide range of localized inshore fisheries that involve multiple harvesting methods. It is apparent to the company that a "one size fits all" management approach will not meet the real management needs of the fishery.
- 15 Analysis of the current ACE position is unhelpful as it only reflects ACE v. catch at this moment. However the Fish Serve register shows that there are 86 ITQ owners for RCO 3 and that these ITQ owners support a total of **xx** ACE holders for RCO3. As the fishing year progresses it is apparent that the number of ACE holders and fishers who have an ACE obligation will increase.
- 16 SE Finfish submit that the more severe the IPP proposal, the greater the economic impact will be for the majority of RCO 3 ITQ shareholders who have small holdings that meet their needs for fishing under the current TACC set.
- 17 As the available ACE overhead reduces, the harder it will be for these historic small fishers to balance their catches against ACE and the effect of deemed values and higher ACE prices in response to more competitive demand will eventually drive

these fishers from the industry thus causing further aggregation of quota to an ever decreasing number of ITQ shareholders. With the demise of these fishers from the industry, so will the catching sector be reduced and the skill and knowledge bases be eroded. It will become harder to introduce new entrants into the industry because of the increased capital costs of purchase of ITQ/ACE, and particularly in the case of ACE fishers, the lack of certainty of tenure to protect investment in plant and vessels.

- 18 SE Finfish note RCO3 is listed on Schedule 2 of the Act. Currently, the mechanism for in-season adjustments is cumbersome and time consuming. Schedule 2 is supposed to allow for TACC movement in times of abundance for cyclical or highly variable fisheries. It is a mechanism that has been little used due to its cumbersome nature and often any in-season increases that have been achieved have been too late to benefit the fishery as there is always the risk of any request being denied. This needs to be considered and rectified before any significant changes to TACCs are introduced.
- 19 SE Finfish notes that there is an element of reallocation of rights to the customary and recreational fishing interests. This appears to be the introduction of the government’s shared fisheries policy via the back door and the introduction of TACs.
- 20 SE Finfish respects the Ministry’s requirement to introduce TACs in fisheries where there is a customary and/or recreational interest and does not oppose this policy in principle. However, the company does not accept or support the manner in which the Ministry has proposed this in relation to options 2, 3 and 4 for RCO 3.
- 21 SE Finfish will accept the allocations for customary and recreational interests as proposed in option 1 for each of the stocks as they do not affect the existing property rights of ITQ shareholders. However, the company insists that any reduction in TACC that results from the IPP and FAP process be applied in a pro-rated manner to both the customary and recreational allocations in the options reflecting the level of reduction in the TACC. Refer to the table below:

RCO3	Option 1 (TACC 0.00% Reduced)		Option 2 (TACC 27.40% Reduced)		Option 3 (TACC 43.53% Reduced)		Option 4 (TACC 62.89% Reduced)	
	IPP	SE Finfish	IPP	SE Finfish	IPP	SE Finfish	IPP	SE Finfish
<b>TAC</b>	13,299	13,299	9,735	9,210.54	7,635	7,509.925	4,930	4,935.104
<b>Customary</b>	5	5	5	3.63	5	2.824	5	1.856
<b>Recreational</b>	280	280	280	203.28	280	158.116	95	103.908
<b>Other</b>	618	618	450	448.668	350	348.985	230	229.34
<b>TACC</b>	12,396	12,396	9,000	9,000	7,000	7,000	4,600	4,600

Table 6: RCO3 Adjusted for equitable reductions

- 22 SE Finfish makes the following proposals:

- Support Option 1 for RCO 3;
  - TACC unchanged;
  - TAC imposed above TACC;
  - Support allocations within TAC for:

- Customary
  - Recreational
  - Other fisheries related mortality
- Oppose any re-allocation of property rights in options 2-4 for RCO3 whereby recreational allocation remains unchanged but the TACC component reduces:
  - Support a justified recreational allocation under the TAC that is supported by recreational catch and effort research data;
  - Oppose re-allocation of rights
    - If TACC is to be reduced then recreational allocation must also be reduced below the proposed level of Option 1 on a pro-rated basis so that proportionality is retained and equity preserved
- In supporting the status quo (Option 1)
  - Provide economic data to support the fishery
  - Undertake to complete characterisations of RCO3 fishery including CPUE analysis
  - Confirm our willingness to engage collaboratively with MFish to develop SE Inshore Fisheries Plan as agreed by the SE Finfish Board in a meeting with MFish Operations South in February 2007 as a priority
- Promote the change in management from section 13 to section 14 of the Act
- Develop, in conjunction with MFish, robust decision rules for in-season TACC increases that occur in a timely manner so as to provide benefit in times of high stock abundance under Schedule 2 of the Act
- Seek a negotiated TACC reduction to more manageable levels in 2008 provided that all of above have been achieved.
- Support the development and implementation of a hybrid trawl survey through the Inshore Fisheries Assessment Working Group and the Inshore Research Planning Group/Coordination Committee process that is specifically designed to meet the research needs of the SE inshore fisheries.

23 SE Finfish believes that there needs to be characterisations completed for both the FLA3 and RCO3 fisheries. This is particularly important given the large area covered by these fisheries and the diverse multi-species/method fisheries that make up each of these fisheries. Characterisations will lead to a better understanding of each of these fisheries and will provide guidance on the most appropriate management tools that should be applied. This will provide the basic ground work for a fisheries plan that will meet the needs of the diverse finfish fisheries of FMAs 3 and 5.

24 The diversity and demographics of each of these fisheries are not well understood and there is an urgent need to carry out an economic impact assessment that will show the impact of each IPP option on the fishery and the industry. This needs to be carried out BEFORE any option other than the status quo is introduced. A project to review the economics of these fisheries should be commissioned as soon as possible.

25 SE Finfish notes that a research project (INS2008/02) has been proposed by the Ministry for the 2008/09 fishing year. The company considers that this project supports the company's proposals above and will support this project as a HIGH PRIORITY if the company's proposals are accepted as an interim measure to provide time to develop and implement a management regime for SE Inshore finfish fisheries

that better meets the needs of this diverse area, rather than the blunt instrument, one size fits all measure of drastic TACC reductions.

### **Seafood Industry Council Limited (SeaIC)**

- 26 SeaFIC recommends that further work needs to be undertaken on the problem definition for RCO 3 and that fundamental questions about the way in which the fishery is managed should be addressed, ideally prior to any TACC adjustments. A full characterisation of the fishery would assist in clarifying the problem definition.
- 27 SeaFIC submits that as an alternative to a TACC reduction, consideration should be given to the use of quota owner initiatives to withhold excess ACE in years of high abundance and spread effort to alleviate any localised abundance problems.
- 28 SeaFIC also submits that any TAC reduction should be proportional across the TACC and recreational allowances.
- 29 SeaFIC notes that there are two potentially available approaches for managing highly variable stocks. Either (1) a TACC can be set at a relatively low level, and provision made for years of higher abundance by way of in-season increases, or (2) a TACC can be set at a relatively high level and provision made for years of lower abundance by arrangements between quota owners to set aside “excess” ACE. The management regime for a highly variable fishery should also reflect the management objectives of those with rights and interests in the fishery – for example, quota owners may wish to maintain relatively constant catches over time, or they may wish to take advantage of periods of high abundance and reduce catches during periods of low abundance.
- 30 SeaFIC considers that ideally an appropriate management regime would be agreed between those with an interest in the fishery (for instance, by way of a fisheries plan) prior to specific decisions being made on a TAC.
- 31 SeaFIC does not support setting a lower TAC and making use of the in-season TACC increase mechanism under the Second Schedule. The IPP proposals rely on the use of in-season TACC increases to alleviate any constraints on utilisation caused by the reduced TACCs proposed in the IPP. However, the IPP contains no analysis of the potential costs of this approach. Questions that should be addressed include:
- what research is required to support an in-season increase, and at what cost?
  - what is the likelihood of actually obtaining in-season increases, given other MFish regulatory priorities?
  - to what extent might the uncertain policy framework for the allocation of shared fisheries impact on the ability to secure an in-season increase for RCO 3?
  - what is the ongoing cost to quota owners of the uncertainty around whether or not an in-season increase is obtained?
- 32 SeaFIC notes that the preparation of a fisheries plan for [the southern inshore finfish fishery] may provide more certainty around the circumstances in which an in-season increase might be appropriate (for instance, by way of an agreed decision rule), but this does not alleviate the primary concern that other issues may take higher priority in MFish’s regulatory prioritisation process.

- 33 SeaFIC considers that the FAP should give explicit consideration to the alternative approach of retaining a relatively high TACC and relying on the actions of quota owners to set aside ACE in years of lower abundance (i.e., shelving).
- 34 SeaFIC notes that the discussion in the IPP suggests that the observed mismatch between catch and TACC in the fishery is well suited to being addressed by way of quota-owner initiatives. The IPP emphasises the “open access” and “race for catch” characteristics of the fisheries and the resulting inefficiencies that can arise from a high TACC. It is suggested that current management compromises marketing continuity and obtaining best value from the fishery. SeaFIC submits that all of these “problems” are commercial utilisation issues that are not the business of the government, and are more appropriately dealt with by quota owners.
- 35 SeaFIC considers that the long-term solutions to the issues lie in developing better policy frameworks, incentives and statutory tools for collective action by quota owners.
- 36 SeaFIC submit it is clear that any TACC reduction will have disproportionate impacts across people involved in the fishery. Fishers with smaller operations will be impacted more than those with larger quota or ACE holdings, because smaller operators will currently be using all their ACE to cover their catch, whereas larger operators will have existing headroom and will not be impacted to the same extent.
- 37 SeaFIC suggests that a full fishery characterisation would be a useful first step towards the preparation of a fisheries plan. Because of the nature of the economic information required for such a characterisation, we suggest that the CSO needs to be closely involved in this work.
- 38 SeaFIC submit that options 2 and 3 propose non-proportional reductions. SeaFIC notes that discussion of proportionality in RCO 3 is made difficult by the fact that no TAC or non-commercial allowances have previously been set. Therefore while the IPP proposes non-proportional reductions “on-paper”, the situation with regard to actual catch is more complicated. The Ministry’s justification for proposing non-proportional reductions in each case appears to be that the various TACC options reflect measures of recent actual commercial catches, and so the non-commercial allowances should also be based on estimates of actual catch. SeaFIC considers this justification to be illogical and inconsistent. The estimates of non-commercial catch used for setting the allowances are based on estimates made in historical years of high abundance and do not reflect current catch, whereas the TACC options are based on averages that include recent years of low abundance.
- 39 SeaFIC submits that if actual catch is to be the basis of setting the allowances and TACC for RCO 3, then this measurement should be applied consistently across commercial and non-commercial catch, resulting in proportional adjustments that are fair to each sector.
- 40 SeaFIC considers it reasonable to expect that both commercial and non-commercial fishers will have to reduce their catches of highly variable stocks in years of low abundance, yet this self-evident concept is not reflected in the IPP.

**Ocean Fisheries Ltd ( QRN # : 8471824 )**

and

**Ocean Fisheries Quota Holding Company Ltd (QRN # 9160046 ) (Ocean Fisheries)**

- 41 Ocean Fisheries submit they operate two Inshore Trawlers, the FT Frontier and the FT Cressy, both of which are based from the Port of Lyttelton. The vessels fish a wide variety of species within Inshore Area 03 - which is a very diverse / multi-species fishery, with few occasions when a target species only is able to be caught.
- 42 Ocean Fisheries submit they own Quota Shares for RCO 3, and in addition to this we also purchase and sell ACE as required.
- 43 Ocean Fisheries submit they have not received any information or discussion that would suggest that sustainability of the RCO 3 fishery or indeed any other fishery will be enhanced through a reduction in the TAC or TACC for RCO 3.
- 44 Ocean Fisheries submit they DO NOT support any reduction in TACC for RCO 3.
- 45 Ocean Fisheries submit they strongly believe that much of the variability in landed catch for RCO3 is due to changing catch effort as many smaller vessels have exited the industry or reduced their efforts, also changing fishing methods, and, on occasions, the pressure of large landings means that the Processing Factories constrain catches more than in previous years. There is also the suggestion of poor practices by some fishers who have caught and discarded large quantities of small fish leading to reduced numbers of adult fish in the fishery in subsequent years.
- 46 Ocean Fisheries submit if the TACC for RCO 3 is reduced, they are not confident that industry can have the TACC increased in future years to reflect a change in the fishery or effort within a fishery - for example the effort of smaller vessels increased, fishing effort moved back to inshore, etc.
- 47 Ocean Fisheries submit there does not currently appear to be any suitable mechanism to allow for upward adjustment of a TACC, without significant scientific evidence to support an increase.
- 48 Ocean Fisheries submit they would support Option 1.

**Environment and Conservation Organisations of NZ Inc. (ECO)**

- 49 The Environment and Conservation Organisations of NZ (ECO) is the national alliance of 62 groups with a concern for the environment. ECO has been concerned at the state of marine management and the impacts of fishing on threatened species for over 20 years.
- 50 ECO submit they support a reduction in the TACC to the average catch of the last 5 years as a move towards the MCY estimate.

## **New Zealand Recreational Fishers Council (NZRFC)**

- 51 NZRFC agrees that the productivity of RCO 3 is in a very poor state. NZRFC wonder why it has taken 20 years to get around to undertaking this review and suggest that priority be given to reviews of all other similarly forgotten fisheries. There are several examples where, despite significant complaints over many years from amateur fishers about unfair commercial practises denying amateurs reasonable access, nothing has been done.
- 52 NZRFC submit that given the poor state of this fishery for several years, amateurs have effectively been denied access to a reasonable daily bag and in many instances have given up trying due to the lack of available fish. NZRFC, therefore, suggest that if management measures are introduced to rebuild the fishery, that amateur take, and subsequently allowance, be reassessed at five yearly intervals. This will enable a more accurate assessment of the amateur catch to be built over time and enable [the Minister] “to allow for” as prescribed in section 21 of the Act.
- 53 NZRFC submit that the lack of accessible fish for amateurs in RCO 3 is as the result of localised depletion caused by excessive commercial fishing pressure. TACCs that can never be caught are unacceptable.
- 54 Having TACCs, and subsequently ACE available, grossly in excess of available catch has enabled over catch of by catch species to occur under the guise of “targeted fishing”. Processors have simply used cheap deeming values associated with many species to cover the by catch taken while some commercial operators were trying to catch Red Cod they knew wasn’t there. NZRFC understands that deeming values are presently under review and urge MFish to set realistic rates that stop the over catch of non-targeted species.
- 55 The NZRFC is alarmed to see the main bycatch species in the pursuit of these mythical red cod are also important species for the amateur sector. Any catch in excess of TACCs for red gurnard, elephant fish, rig, school shark, groper or tarakihi will be affecting the amateur sectors chances of achieving a reasonable daily bag in these associated species. With the significant limitations and gear restrictions that amateurs face even small decreases in stock abundances can lead to poor catches resulting in social and cultural dislocation for amateurs.
- 56 The NZRFC accepts that the QMS and TACC reductions are a fairly blunt management tool. Reductions in available quota for one species can often result in commercial fishers being left with unbalanced quota portfolios. We recognize the pressures brought to bear when competing companies control ACE for key by catch species, but submit that correct management resulting in truly sustainable fisheries must always be the goal.
- 57 NZRFC supports fishery plans and objective based management but submit that, until such time as amateur resourcing issues have been addressed, that MFish reduce commercial landings to ensure the RCO 3 fishery moves to a stock level that will support MSY.
- 58 NZRFC agrees with MFish that the reported catches for RCO 3 have shown an alarming decline in recent years. As red cod are a relatively short lived species we

submit that all catch history more than 8 years old should be put aside when future catch allowance decisions are being made. A conservative catch limit should be set to allow the stocks to recover. As RCO 3 is on the 2<sup>nd</sup> schedule, if a rapid increase in availability is seen, further ACE can be created at short notice.

- 59 In addition to a significant reduction in TACC those areas known to be predominately occupied by juvenile red cod must be protected.
- 60 In addition, NZRFC notes that some southern amateur fishers are prepared to accept significant bag limit reductions in an effort to rebuild the RCO3 fishery. The NZRFC submits that if bag limit reductions are included as part of a rebuild package that recognition of this is given by the creation of a number of juvenile protection and non-commercial only areas. In addition we submit that if a bag limit reduction is included in the proposal, that if an in-season adjustment is made to increase the allowable commercial catch, a corresponding increase is made to the amateur bag limit.
- 61 NZRFC is keen to see a rebuild in the RCO 3 fishery but doesn't accept that the amateur sector has played any significant part in fishing red cod down to the present low levels.
- 62 NZRFC submits the RCO 3 TAC and TACC allowances for the 2007-8 fishing year should be:
- 63 Setting the TAC at 4930 tonnes and within that TAC set:
- a) a customary allowance of 5 tonnes;
  - b) a recreational allowance of 195 tonnes;
  - c) an allowance of 230 tonnes for other sources of fishing related mortality;
  - d) a TACC of 4500 tonnes, and
  - e) subject to closed areas for juveniles and non-commercial access temporarily reduce the amateur bag limit to 15.
- 64 The NZRFC recognizes that this catch reduction will have significant impact on commercial fishers and, on its own, won't necessarily address any particular areas of localized depletion. Commercial effort could still be concentrated in popular amateur areas thus not providing a good outcome for any sector.

### **Sanford Limited (Sanford)**

- 65 Sanford support the continued setting of "headroom" TACCS in highly variable stocks to allow for harvest utilisation during years of high abundance.
- 66 Sanford support a reduction of the TACC by 25%, which is option 2 of the IPP. This option will ensure sustainability, whilst provide for utilisation during years of high abundance without restricting harvest levels during these periods.
- 67 Sanford believe more consideration should be given to managing red cod under Section 14 of the Act (Third Schedule Species), providing for in season adjustments.

Sanford has concerns regarding the setting of the recreational TAC allowance for each of the options. The maintaining of the TAC recreational allocation while reducing the TACC constitutes reallocation and they oppose it.