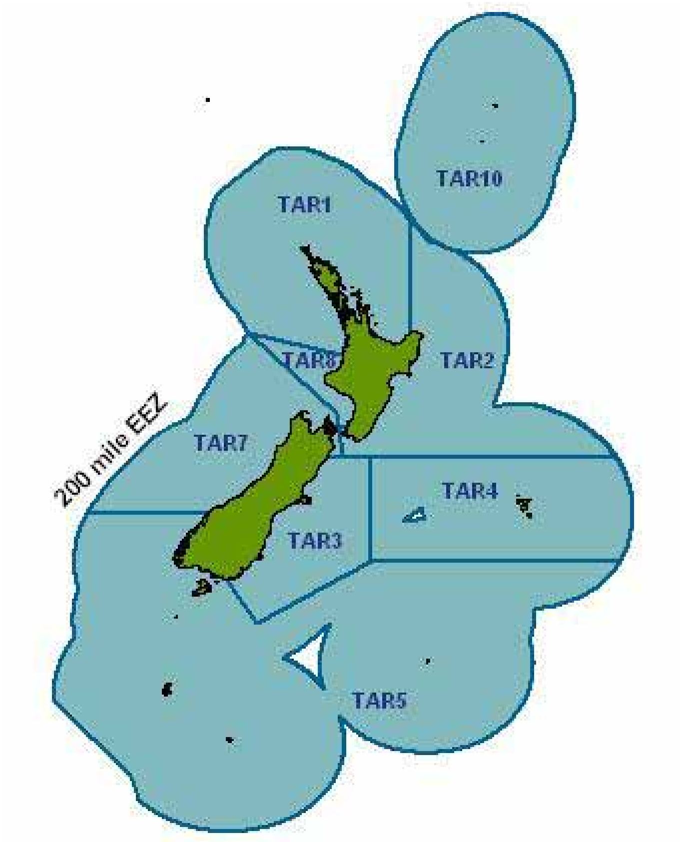
TARAKIHI (TAR 1) – FINAL ADVICE

Figure 1: Quota Management Areas for TAR



Executive Summary

1 This final advice paper (FAP) provides advice to you on reviewing the Total Allowable Catch (TAC) for TAR 1, the Total Allowable Commercial Catch (TACC) and allowances for the customary and recreational fisheries and other sources of fishery-related mortality.

2 The current TAC for TAR 1 was set at 1 958 tonnes in 2002. Recent commercial catches have exceeded the TACC by up to 10%, averaging 5% in excess of the TACC per annum over the last 10 years.

3 TAR 1 is a relatively information-poor fishery with little fishery-independent information available, though it is thought that fishery-dependent catch per unit of effort indices (CPUE) provides information on trends in abundance. There is no estimate of stock size or maximum sustainable yield (MSY). Research is commencing later this year to update CPUE indices for TAR 1 and a two-year shed sampling study will provide information on the size and age composition of the commercial catch. These two projects will provide information useful for a formal stock assessment in the near future. The 2007 Plenary report states "Based on relatively stable indices of abundance current catches and the TACC for TAR 1 appear to be sustainable." The IPP stated "Recent [commercial] catches have exceeded the

TACC by up to 10% (averaging 5% over-catch during the last 10 years) with no sustainability concerns apparent.

4 The Initial Position Paper (IPP) was released in July 2007. As stated in the IPP, taking account of the uncertainty in the best available information, MFish recommends you set the TAC under section 13(2)(a) of the Fisheries Act 1996: to maintain the stock at or above the biomass level that can produce the maximum sustainable yield (B_{MSY}), having regard to the interdependence of stocks. The IPP proposed three options for reviewing the TAC and under each TAC option, three different TACC/allowance options. MFish proposes those same options for your consideration here.

5 Option 1 retains the existing TAC. Sub-options a, b, and c propose three different allocation proposals. Sub-option 1a retains the existing allocations. If you choose sub-option 1a, and decide to increase the deemed value for TAR 1 (refer to the deemed value section of this FAP), it will likely result in a reduction in the landed commercial catch. Sub-options 1b and 1c propose a reallocation of the existing TAC in favour of the commercial and non-commercial sectors respectively. Options 1b and 1c were not supported by any of the submitters and are not recommended by MFish.

6 Option 2 proposes a 70 tonne increase in the TAC. Sub-options a, b and c propose three different allocations; sub-option a, proportional, sub-option b, all to commercial sector and sub-option c, 35 tonnes to the non-commercial sector and 35 tonnes to the commercial sector (and the allowance for other sources of mortality (OSM)). A 70 tonne increase is the equivalent of the annual average 5% over-catch by the commercial sector over the past 10 years. If combined with the proposed increase in the TAR 1 deemed value, sub-option b would be likely to retain commercial catches at their average existing level.

7 Option 3 proposes a 140 tonne increase in the TAC. Sub-options a, b and c propose three different allocations; sub-option a, proportional, sub-option b, all to the commercial sector and sub-option c, 70 tonnes to the non-commercial sector and 70 tonnes to the commercial sector (and the allowance for other sources of mortality (OSM)). A 140 tonnes increase is equivalent to the largest annual catch by the commercial sector since 1983-84, although catches exceeded 1500 tonnes in 3 of the past 5 years.

8 TAR 1 is a significant shared fishery. All submissions by the non-commercial sector do not support a TAC increase. Reasons for this stance are broad, but stem from the importance of the fishery to the non-commercial sector, the lack of information on stock size, and what the sector considers to be the inappropriateness of rewarding over-fishing. The New Zealand Big Game Fishing Council (NZBGFC) submits that the level of the current recreational allowance (470 tonnes) is appropriate, but notes that recreational fishers are finding it harder to catch tarakihi off Northland's east coast and in the Bay of Plenty. Surveys of recreational catch, although quantitatively uncertain, have indicated that TAR 1 is the largest, by weight, of the recreational tarakihi fisheries in New Zealand and was the 4th largest recreational fishery in the 1996 survey and the 9th in the 1999-00 survey. The 1999-00 survey estimated that the recreational take in TAR 1 was almost half (46%) of the commercial catch over that period. The Ministry has no information on the size of the customary catch.

9 The submissions by the commercial sector (Sanford Limited, Northern Fisheries Management Stakeholder Company Limited and SeaFIC), did not support any of the proposed options. These submitters proposed an Adaptive Management Programme (AMP) or industry-led fisheries plan in conjunction with a 43% increase in the TACC. MFish is

not supportive of initiating any new AMP and, in the circumstances, does not believe a TACC increase of this magnitude, even with improved reporting, is consistent with the requirements of section 13 and the purpose of the Act.

10 There is a strong relationship between having an effective TACC and an effective deemed value regime. For any of the options, if you wish to ensure that the TACC sets an upper limit on commercial catch, it is recommended that the deemed value for this stock is set such that it becomes a disincentive to fishing outside the annual catch entitlement (ACE) regime (details of the deemed value review are provided in the relevant section of the FAP).

11 Some submitters have proposed amending the Quota Management Area (QMA) for TAR 1 by dividing the existing QMA into an east coast and a west coast component. This is outside the scope of the existing IPP process. Some submitters have requested that all trawlers be included within the vessel monitoring system. Again, this is outside the ambit of this TAC review process.

The Issue

12 Commercial landings of TAR 1 have exceeded the TACC for most of the last ten years, with an average over catch of approximately 5% (fishing years 1996-97 to 2005-06). The over catch has resulted in substantial deemed value payments by fishers.

13 Industry has, in recent years, expressed a view that further utilisation opportunities exist in TAR 1. Industry has proposed an AMP to explore this potential. The Northern Fisheries Management Stakeholder Company Limited (Northern Fisheries) requested that a TACC increase be considered in the 2007 October sustainability round. The Northern Fisheries' AMP proposal includes a 43% increase in the TACC. MFish advised that it would not be considering any new AMPs during the 2006/07 financial year. However, it agreed to review the TAC as part of the October 2007 sustainability round.

Summary of Options

Initial Proposal

14 The IPP proposed the options described below.

15 Subsequent to the drafting of the IPP, MFish became aware of a small discrepancy in the level of the TACC, and consequently the TAC. The discrepancy arose from setting a bait allowance in this and other fisheries in 2001. This increased the TACC in TAR 1 from 1 958.000 tonnes to 1 959.195 tonnes pursuant to section 362 of the Fisheries Act 1996 (repealed on 1 October 2004). The following table presents the options proposed in the IPP, but modified to incorporate the bait allowances. As it involves changes of less than 0.1% to the TAC and TACC, MFish does not believe that these modifications materially affect the proposals consulted on in the IPP.

	Allowance Approach	TAC*	Recreational Allowance	Customary Allowance	Other Sources of Mortality	TACC
Option 1. TAC unchanged	a. Status quo	1 959.195	470.000	70.000	20.000	1 399.195
	b. Non-proportional allocation to TACC	1 959.195	410.000	59.000	22.023	1 468.173
	c. Non-proportional allocation to non-commercial sectors	1 959.195	539.000	80.000	19.806	1 320.839
Option 2. TAC increase of 70 tonnes	a. Proportional	2 029.195	487.000	73.000	21.712	1 447.483
	b. Non-proportional allocation to TACC	2 029.195	470.000	70.000	22.007	1 467.188
	c. Non-proportional allocation to non-commercial sectors	2 029.195	500.000	75.000	21.490	1 432.705
Option 3. TAC increase of 140 tonnes	a. Proportional	2 099.195	505.000	76.000	22.436	1 495.759
	b. Non-proportional allocation to TACC	2 099.195	470.000	70.000	23.042	1 536.153
	c. Non-proportional allocation to non-commercial sectors	2 099.195	530.000	80.000	22.007	1 467.188

***all numbers in this table and the options below are expressed in tonnes to three decimal places to ensure accuracy. However, elsewhere in the paper, figures are generally expressed without decimal places for simplicity. For exact figures, please refer to this table.**

e) *Options 1a, b and c*: propose a status quo approach with retention of the current TAC at 1 959.195 tonnes. Within these TAC options, you may choose to retain the current allowances (**1a**); to assign a greater proportion of the TAC to the TACC (**1b**); or to assign a greater proportion of the TAC to non-commercial allowances (**1c**).

f) *Options 2a, b and c* propose an increase to the TAC of 70.000 tonnes (5% of the current TACC), in line with the average commercial over catch during the last 10 years. Within these options, you may choose to assign the increase proportionally to all sectors (**2a**); or disproportionately by assigning the increase to the TACC (**2b**); and in the case of **2c** 35.000 tonnes would be allocated to the non-commercial sector and 35.000 tonnes to the commercial sector.

g) *Options 3a, b and c* propose an increase to the TAC of 140.000 tonnes (10% of the current TACC), in line with the highest level of commercial over catch in the fishery since at least 1983–84. Within these options, you may choose to assign the increase proportionally to all sectors (**3a**); or disproportionately by assigning the increase to the TACC (**3b**); and in the case of **3c** 70.000 tonnes would be assigned to the non-commercial sector and 70.000 tonnes to the commercial sector.

Final Proposal

16 MFish recommends that you:

EITHER

a) Maintain the existing TAC and allocations (Option 1a),

OR

b) Increase the TAC to 2 029.195 tonnes (70 tonne increase) and within the TAC:

i) In accordance with Option 2a allocate 17.000 additional tonnes to the recreational allowance, 3.000 additional tonnes to the customary allowance, 1.712 tonnes to “other sources of fishing-related mortality”, and 48.288 tonnes to the TACC

OR

ii) In accordance with Option 2b allocate 2.007 additional tonnes to “other sources of fishing-related mortality”, and 67.993 additional tonnes to the TACC

OR

iii) In accordance with Option 2c allocate 30.000 additional tonnes to the recreational allowance, 5.000 additional tonnes to the customary allowance, 1.490 additional tonnes to “other sources of fishing-related mortality”, and 33.510 additional tonnes to the TACC.

OR

c) Increase the TAC to 2 099.195 tonnes (140 tonne increase) and within the TAC:

i) In accordance with Option 3a allocate 35.000 additional tonnes to the recreational allowance, 6.000 additional tonnes to the customary allowance, 2.436 additional tonnes to “other sources of fishing-related mortality”, and 96.564 additional tonnes to the TACC.

OR

ii) In accordance with Option 3b allocate 3.042 additional tonnes to “other sources of fishing-related mortality”, and 136.153 additional tonnes to the TACC.

OR

iii) In accordance with Option 3c allocate 60.000 additional tonnes to the recreational allowance, 10.000 additional tonnes to the customary allowance, 2.007 additional tonnes to “other sources of fishing-related mortality”, and 67.993 additional tonnes to the TACC.

Consultation

17 Your decision on whether or not to adjust the TAC for TAR1 is a decision under section 13(4)/s13(2)(a) of the Act and therefore the consultation requirements of section 12 apply. Further, in respect of your decision whether or not to adjust the TACC for TAR1, the consultation requirements set out in section 21(2) apply.

18 Consultation on the IPP was undertaken with such persons or organisations representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned, including Maori, environmental, commercial, and recreational interests. Further, provision was made for the input and participation of tangata whenua having a non-commercial interest in the stock or an interest in the effects of fishing on the aquatic environment in the area concerned, having particular regard to Kaitiakitanga.

19 MFish followed its standard consultation process for IPPs in the October 2007 sustainability round. This involved posting all IPPs on MFish's website, and alerting stakeholders to this through a letter sent to approximately 350 companies, organisations and individuals. Analysts from MFish's Auckland office also presented the TAR 1 IPP at meetings of the Te Hiku o Te Ika (Far North Regional Iwi Forum), Mai i Nga Kuri a Wharei ki Tihirau (Bay of Plenty Regional Iwi Forum) and Nga Hapu o Te Uru (Waikato Regional Iwi Forum). This allowed members of these forums to discuss these issues both at the forum and with their respective iwi/hapu and to lodge a submission if they felt it necessary.

Submissions Received

20 Submissions to the TAR 1 IPP were received from the following parties:

- Aotearoa Fisheries Limited
- Area 2 Inshore Finfish Management Company Ltd.
- Environment and Conservation Organisations of NZ Inc. (ECO)
- New Zealand Big Game Fishing Council Inc. (NZBGFC)
- New Zealand Recreational Fishing Council (NZRFC)
- New Zealand Seafood Industry Council Ltd. (SeaFIC)
- New Zealand Seafood Industry Council (deemed value only)
- Nga Hapu o Te Uru
- Non-commercial Fishers (New Zealand Big Game Fishing Council and option4) (deemed value only)
- Sanford Limited
- Te Runanga O Te Rarawa

- The Northern Fisheries Management Stakeholder Company Limited (Northern Fisheries)

25 A summary of the submissions and copies of the submissions in full are included in Volume 2 and Volume 3.

MFish Discussion

21 This section addresses the issues raised by submitters. The key views of submitters are raised under each heading and the MFish response provided.

Response to Options Proposed by MFish

22 All environmental, recreational and customary submitters express their desire to see the current TAC, TACC and allowances maintained in TAR 1. Retention of the "status quo" was represented by option 1a in the IPP, though only some of the submitters explicitly expressed their support for this option, with others simply advocating for no change to current management. The non-commercial submitters generally cite a lack of information about the status of this stock as the main reason for maintaining the status quo, with many arguing that any changes to the TAC should be deferred until more information is available. The NZBGFC noted that the current recreational allowance of 470 tonnes in TAR 1 seems to be providing for the requirements of that sector. No submissions called for any change to the recreational allowance, though NZBGFC noted that the customary allowance might be too small.

23 Northern Fisheries, which represents 91% of the TAR 1 quota share owners, and Sanford, which holds 34.4% of TAR 1 quota shares, propose increasing the TACC to 2000 tonnes, an increase of 601 tonnes. This proposal is centred on an industry-proposed AMP. However, in recognition that new AMPs would not be considered in this process by MFish, the submitters suggest that the proposed AMP could be re-worked into an industry-led fishery plan and/or contractual agreements such as a memorandum of understanding. SeaFIC notes that it was "extremely unfortunate" that submitters were not provided with a chance to comment on this proposal. SeaFIC contends that this option should not be disadvantaged in your deliberations because MFish failed to consult on this matter. While this option was not consulted on, MFish considers that the views expressed in the non-commercial submissions arguing against the increases proposed in the IPP would apply to larger increases also. MFish notes also that a similar proposal for an AMP in TAR 1 was consulted on in 2003, with all non-commercial respondents expressing their opposition to that proposal, though Northern Fisheries does claim to have addressed some of the concerns of non-commercial submitters in the newest version of the AMP proposal.

24 In its submission, Northern Fisheries states that it was under the impression the basis of the AMP proposal (a 43% increase to the TACC and associated catch splitting, monitoring, research and performance reviews) discussed with MFish staff would be included as a management option (though not necessarily in the form of an AMP) and consulted on through the IPP.

25 MFish notes that it did not undertake to propose the AMP (either as an AMP or in any other form) as an option in the IPP. Rather, MFish agreed to review the updated AMP proposal, and to use any new information in this proposal in the development of management options for the IPP. At a meeting prior to the drafting of the IPP, MFish informed Northern

Fisheries that it was no longer accepting new AMP applications, and that outside of the AMP framework, large increases to a TAC were unlikely to be progressed without sufficient supporting information to suggest they might be sustainable and might move the stock towards a level that could support the MSY. MFish reviewed the updated AMP proposal provided by Northern Fisheries and while the information contained within was used to help develop options 2 and 3, MFish felt that this information was not sufficient to justify a 43% increase to the TACC outside of an AMP program.

26 As an alternative to an AMP, the commercial submitters suggested the development of an industry-led fisheries plan. MFish considers that an industry-led fisheries plan is not appropriate for an important shared fishery such as TAR 1. MFish is planning to work with all stakeholders over the coming five years on developing a fisheries plan for north eastern finfish stocks that will include TAR 1.

27 Commercial fishing interests did not support any of the proposed options. Submissions from Northern Fisheries, Sanford and SeaFIC contend that the three options proposed by MFish are unnecessarily conservative, and that the full range of potential options has not been explored. Northern Fisheries and SeaFIC refer to the long, stable catch history in the fishery, stable or increasing CPUE indices, historical stock assessments and Plenary reports as evidence that TAR 1 is likely to be at or above B_{MSY} and could support additional utilisation. SeaFIC also notes that MFish's advice that the TAC in TAR 1 should be set under s 13(2)(a) and the absence of any evidence in the IPP to suggest that the stock might be below B_{MSY} indicate that MFish believes that the stock is at or above B_{MSY}. SeaFIC concludes that the only reason an "extremely conservative" range of options is proposed is uncertainty surrounding the non-commercial catch. All commercial submitters argue that an option to increase the TACC to 2000 tonnes should have been included in the IPP, either in the form of an AMP or an industry-led fisheries plan. These submitters believe that a range of measures including catch spreading, areas closed to commercial fishing, several research projects and monitoring and performance reviews would mitigate any adverse effects of this TACC increase to other sectors, and to the fish stock itself.

28 MFish believes that the stock is probably at or above B_{MSY}, and might support increased catch. However, MFish notes that the highest commercial catch taken from the fishery was 1541 tonnes in 03–04, approximately 10% in excess of the TACC. MFish is not aware of any information suggesting that an increase to the TAC of more than 140 tonnes is likely to be sustainable or that it would maintain the stock at a level at or above B_{MSY} as required by section 13(2)(a). Indeed, a more cautious approach than increasing the TAC to recognise the highest recorded commercial landing would be to base any increase on average landings over a longer period, as represented by option 2.

29 MFish acknowledges that, in 2002 the AMP Working Group considered it likely that the stock was at or above B_{MSY}. However, the 2007 Plenary report is silent on $B_{MSY.}$ Relatively stable catches for a long period and stable CPUE indices to 2003 indicate the population is probably relatively stable, but these have not been updated since. While MFish considers that the stock probably is at or above $B_{MSY,}$ the lack of a full stock assessment means that there is significant uncertainty surrounding that assumption.

30 Considering the above, MFish does not support any increase beyond those discussed in the IPP, and because of this, Northern Fisheries' preferred option of a 43% increase to the TACC was not proposed in the IPP. As expressed in the IPP, MFish is not accepting new AMP applications in this process and, outside of the AMP framework, any change to a TAC

must be supported by existing information. MFish considers that the information supplied by Northern Fisheries could only support TAC increases as large as those proposed in the IPP. Increases in excess of those proposed would not be appropriate without improved information to suggest that they would maintain the stock at or above the level that would produce B_{MSY}.

31 SeaFIC asserts that the only reason greater increases to the TAC are not proposed in the IPP is uncertainty surrounding the non-commercial catch, and are concerned that any proposals from industry will be declined on this basis. MFish notes that the primary reason for not including the industry proposal for a 43% increase to the TACC as an option in the IPP pertains to uncertainty surrounding the status of the TAR 1 stock, not uncertainty surrounding recreational catch.

32 SeaFIC maintains that ideally, any “reasonable” increase to a TAC should be allocated proportionally across all sectors. However, they argue that if only “conservative” TAC increases are proposed, there is sufficient justification to assign any resultant increase to the TACC only. This position is justified by reference to the uncertainty surrounding the level of the non-commercial catch. SeaFIC contends that there is no rationale for increasing the non-commercial allowances beyond current estimates of catch for these sectors, and that to do so would only increase the proportion of the TAR 1 catch that is not reported or effectively monitored and would not realise best value in the fishery.

33 MFish notes that submissions from recreational fishers either did not request an increase in the recreational allowance, or in the case of the NZBGFC stated that the existing allowance appeared to be adequate.

34 You have discretion regarding setting the TACC and allowances in respect of enabling the different sectors to provide for their wellbeing. Should you consider it necessary to alter allowances for the respective sectors to better provide for their wellbeing, MFish notes that you are provided with options to that end.

Over Fishing and Deemed Values

35 There appears to be general support amongst submitters for the proposed increase in deemed values for TAR 1 (and adjacent TAR stocks). However, submitters express different views on the recent over catch in this fishery. Commercial submitters note that this over catch (in conjunction with CPUE data) proves that additional catch, in excess of the current TAC, is available in TAR 1. They state that option 1a in the IPP does not represent the status quo, but would essentially act to reduce catch levels as the higher deemed values proposed for this fishery would constrain catch below current levels.

36 In contrast, several recreational submitters contend that catch in excess of the TACC should not be “rewarded” by increasing the TACC to recognise this over catch. They argue this creates an incentive to commercial fishers to exceed catch limits and is not a legitimate reason to increase the TAC or TACC for this fishery.

37 MFish advises you that catches (which are above the TACC) and the TACC for TAR 1 appear to be sustainable and on balance, MFish considers that it is probable that the stock is at or above B_{MSY}. This, in conjunction with other indicators, e.g., a stable commercial catch history, provides some evidence that TAR 1 might support a higher TAC.

38 MFish notes that the previous deemed value regime might not have been effective in deterring over catch in this fishery. However, MFish also notes that a review of deemed values is currently proposing higher interim, annual and differential deemed value rates in this fishery, and that the TAC (whether or not it is changed) is unlikely to be over caught if the proposed changes to deemed values are implemented. MFish also notes cross-sector support for this review amongst submitters to the TAR 1 IPP.

39 MFish notes that the term "status quo" applies to the levels at which the TAC is set, not to actual catch levels. However, MFish agrees with some of the commercial submitters that if you were to opt for option 1a, the proposed increases to deemed values in this fishery could slightly reduce overall catch and commercial value from TAR 1. Similarly, MFish notes that options 2 and 3 in the IPP would not necessarily result in catch in excess of current levels.

Lack of Information and Impending Research

40 Most of the non-commercial submissions raise concerns about the lack of information in TAR 1. They state that the TAC should not be revised until such time as better information is available. The NZRFC comments on the shed sampling and the CPUE analysis and states that the TAC should not be reviewed until this information is available and a formal stock assessment is undertaken. Commercial submitters disagree with this assessment, maintaining that there is already sufficient information to support a much larger increase to the TAC than those proposed in the IPP.

41 The 2007 Plenary report provides a snapshot of the status of TAR 1. This report concludes that "based on the relatively stable indices of abundance current catches and the TACC for TAR 1 appear to be sustainable." However, this statement provides no indication of the stock level for TAR 1 in relation to $B_{MSY.}$ It is also noted that the NZBGFC has suggested that recreational fishers are finding it harder to catch tarakihi.

42 As noted in the IPP, two research projects focussed on TAR 1 are scheduled to begin on 1 October 2007; a CPUE analysis due to be completed in 2007–08 fishing year and a two-year shed sampling project due to be completed in 2009. MFish believes that the two research projects will provide more information in the future, and that this information should help inform decisions about setting the TAC. While waiting for this information might, in hindsight, show some economic benefit has been forgone, it may also show the existing TAC is appropriate or that a TAC reduction is necessary. MFish notes that if you do decide to increase the TAC this year, the impending research projects could enable you to monitor any effects of this increase on the stock and make further changes if necessary.

43 MFish acknowledges that TAR 1 is an information-poor fishery and the additional information from the shed sampling and the CPUE will contribute to our understanding of the fishery. Section 10 of the Act provides you with some guidance on how to address such issues when considering an appropriate TAC level. The section requires you to be cautious, but also stipulates that the lack of information is not a reason, in itself, to postpone or not make a decision.

44 Northern Fisheries also raises several other concerns around the proposed research. It believes that the cost of both projects could be reduced if these were conducted under industry-led fish plans or AMPs, noting that the shed sampling project would be at least 50% less costly to quota owners if carried out in this way. It notes that many of the quota owners and licensed fish receivers they represent are unaware of MFish's intention to

conduct this research. MFish notes that the research project (TAR2007/02) was part of the Fisheries Research Services for 2007–08 that was consulted on in early 2007 as part of the consultation process on the Statement of Intent. The project was discussed at the Research Coordinating Committee meeting in October 2006 and SeaFIC provided a submission on the project after that meeting.

Lessons from TAR 2 and TAR 3 Adaptive Management Programmes

45 The NZBGFC submission requested that MFish describe to you what has happened in the TAR 2 and TAR 3 AMPs, as it sees that information to be revealing of how fishers have responded in recent years to TACC increases for TAR under AMPs in other areas. MFish notes that it is not considering an AMP proposal for TAR 1 at this time so the experiences for these stocks are not particularly relevant to your consideration of reviewing the TAC for TAR 1.

46 MFish notes that the TACCs for both stocks were increased under AMPs as from 1 October 2004. In both cases, the previous TACCs had been exceeded in at least three of the five years before the 2004-05 fishing year. The 2007 Plenary report sets out the detailed views of the Adaptive Management Programme Fisheries Assessment Working Group (AMP FAWG) after reviewing progress with TAR 2 and 3 AMPs.

47 MFish notes that the AMP FAWG found several deficiencies with the information provided under the AMPs. For example, AMP FAWG noted various deficiencies with the data being provided under the TAR 3 AMP logbook and catch sampling arrangements. Specifically, the group noted that the logbook scheme was only extended to cover TAR 3 from 2004/05, and that the coverage of catch by season and areas was inadequate.

Quota Management Area Too Large

48 The NZRFC comments that the quota management area (QMA) for TAR 1 too large and should be split such that there is an east coast and a separate west coast QMA. The size of the QMAs was not discussed in the IPP and therefore this issue has not been put before stakeholders. This proposal is outside the existing process and should be considered through a separate process.

Vessel Monitoring System

49 The submission by the NZRFC also suggests that that all commercial fishers in TAR 1 should be required to operate under a vessel monitoring system. This is outside the ambit of this IPP and should be considered in a separate process.

Shared Fishery

50 The recreational submitters stressed the importance of TAR 1 as a shared fishery. In making these comments the NZGBFC noted that despite improved equipment, anecdotal information suggests that catch levels of tarakihi on the east coast of Northland and in the Bay of Plenty were declining. MFish has no information to support or refute this claim. The Ministry is developing a recreational fishing survey that will add some insight to this issue, however, this survey is to be undertaken in the 08/09 fishing year. Accordingly, the results of this survey will not be available to inform the current process.

Iwi Consultation

51 The NZBGFC commented that the Ministry had not met its obligations under section 12 of the Act in relation to providing for input from tangata whenua. Section 12 requires MFish to provide for the input and participation of tangata whenua who have a non-commercial interest in the stock concerned. MFish supports a number of iwi forums within the North Island. MFish presented the IPPs and were available to discuss the proposals with persons concerned.

Rationale for Management Options

Main characteristics of the fishery

52 The 2007 Plenary report states that tarakihi are caught in coastal waters of the North and South Islands of New Zealand, as well as the Chatham Islands and Stewart Island. The main commercial fishing target method is trawling. Major target trawl fisheries are in 100 – 200 metre depths. The overall fishery for tarakihi (all stocks) appears to have been relatively stable since initial development. Similarly, the commercial catch in TAR 1 has been relatively stable since at least 1991-92.

53 The 2007 Plenary report states that, in the North Island tarakihi fisheries, about 70 – 80% of tarakihi commercial catch is taken by target trawling. In TAR 1, some quantity is also taken as a bycatch in trawls targeting other species (including trevally, snapper, and John dory). Relatively small quantities are taken as a bycatch by other commercial methods (including lining) (Fisheries Information System May 2007).

54 There are three main fishery areas for tarakihi in TAR1. The largest target catch is generally taken from the Bay of Plenty (although catches vary between years), with slightly smaller quantities taken from the east coast of Northland and west coast of Northland.

55 The commercial fishery appears to have a seasonal peak in the autumn and winter months, although substantial landings are made throughout the year. Fishers have reported the view that tarakihi move into shallower waters during the cooler months.

56 Recreational fishers in TAR 1 have commented previously that they value the species highly. It is known for its good eating qualities, and probably ranks highly as a food species (tarakihi are within the mixed species daily bag limit of 20 fish). Surveys of recreational catch, although quantitatively uncertain, have indicated that TAR 1 is the largest (by weight) tarakihi fishery in New Zealand. The TAR 1 recreational fishery was estimated to be the 4^{th} largest nationally in the 1996 survey, and 9^{th} largest in the 1999-00 survey.

57 Recreational fishers in TAR 1 are known to target the species using lining methods from boats. The depth distribution of tarakihi in TAR 1 means that it is not often taken by shore-based anglers. In previous discussions with recreational fishers they have indicated that the tarakihi fisheries in the Bay of Plenty and East Northland areas are most important to the sector. In submissions on the IPP, some recreational fishers have reported that tarakihi is currently difficult to catch in the East Northland area.

58 Little is known about the extent of customary catch of tarakihi in TAR 1. While tarakihi is known to have value as a customary food source, recent and current harvest levels are unknown.

59 Between 1993–94 and 2004–05, a second species of tarakihi, king tarakihi, was reported under the code KTA but was managed outside the QMS. During this period, the average annual catch for KTA 1 and 9 combined was 25 tonnes. After the 2004–05 fishing year, fishers were required to report all tarakihi, including king tarakihi, under the code TAR.

60 The figures reported in this FAP, do not reflect this separation and accordingly during the period 1993–94 to 2004–05 the actual tarakihi catch, including king tarakihi, was on average 25 tonnes greater per year than the figures shown.

Information on stock size and maximum sustainable yield (MSY)

61 There is no formal stock assessment for TAR 1 to provide estimates of stock status with respect to B_{MSY}, nor estimates of the MSY. Thus, most information currently available about TAR 1 is derived from the commercial fishery; particularly from catch per unit effort (CPUE) data.[75] While there is often uncertainty associated with CPUE data, the 2007 Plenary report concluded that CPUE indices are probably monitoring tarakihi abundance in TAR 1.

62 The 2007 Plenary report notes that CPUE indices for East Northland and the West Coast North Island fisheries (available for the period 1989-90 to 2003-04) show no trend between 1989/90 and 2003/04; and that CPUE in the Bay of Plenty was stable until 1999-00 when a sharp increase occurred, possibly as a result of good recruitment in 2000-01. Overall, the available CPUE indices in TAR 1 (until 2003-04) are stable or increasing slightly. CPUE indices are to be updated again in 2008. The 2007 Plenary report states that current commercial catches and the TACC appear to be sustainable. The 2007 Plenary did not comment on the TAR 1 stock's biomass in relation to B_{MSY}.

63 Analysing the catch history in TAR 1 is a further useful source of information regarding the potential yield from the fishery. Commercial landings have been relatively stable — varying between 912 tonnes and 1541 tonnes since 1983-84 and between 1387 tonnes and 1541 tonnes over the period 1991-92 to 2005-06. Landings have exceeded the TACC for most of the last ten years, with an average over-catch of approximately 5% during this period (fishing years 1996-97 to 2005-06) (see figure 1).

64 Taken together, these data suggest that increasing the TAC to reflect recent overcatch is likely to be sustainable.

[75] CPUE is a measure of relative abundance of a fish stock and refers to the expected catch for a unit of fishing effort. If catch rate changes, it is taken to indicate a relative change in the abundance of the stock.

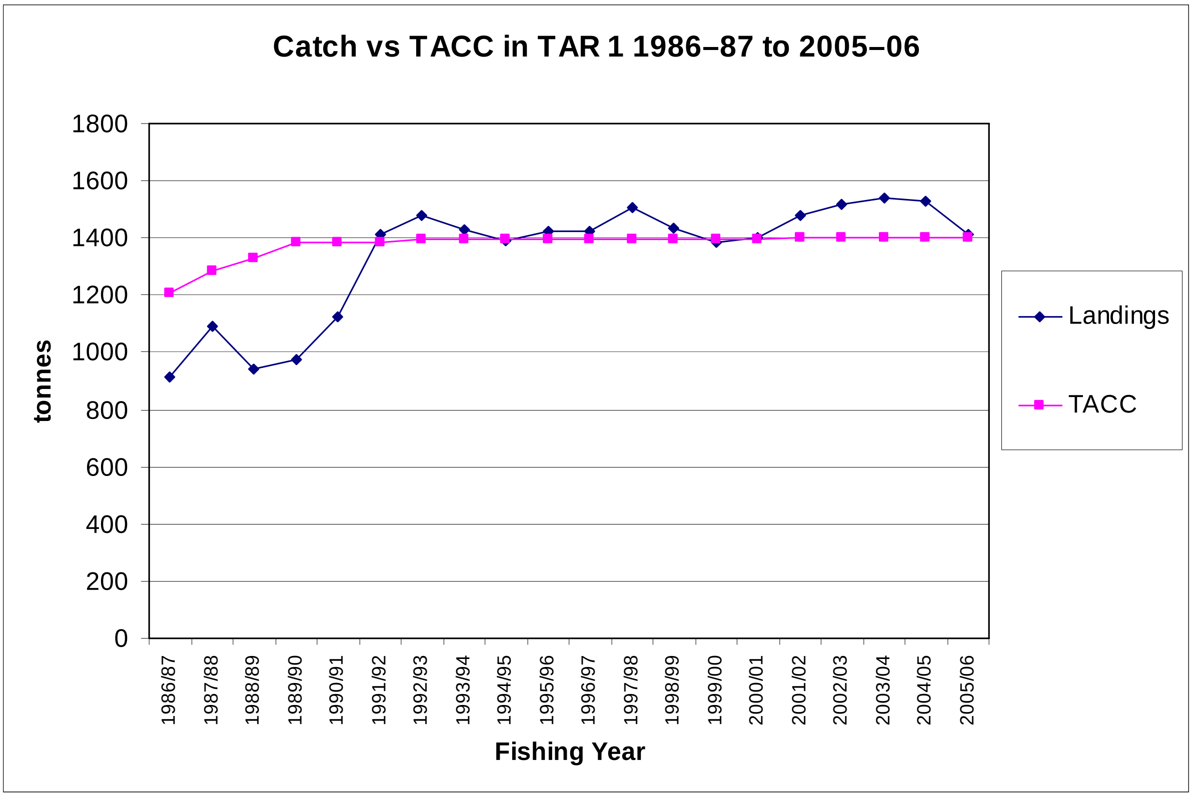


Figure 1: Catch vs. TACC in TAR 1 1986–87 to 2005–06

Over catch of the TACC

65 As noted above, commercial landings have exceeded the TACC for most of the last ten years, with an average over catch of approximately 5% during this period (fishing years 1996-97 to 2005-06).

66 This over catch has resulted in substantial deemed value payments by fishers unable to balance catches against ACE. In the last fishing season (2005–06) deemed value invoices to a value of $80 287 were issued. This is about 2.8% of the landed value of the fishery. However, deemed value payments have been much higher in recent years, with an average of $241 172 over the past five years and a maximum annual total of $391 172 in 03–04.

67 An analysis of the information available suggests that all ACE has been used in most years. A relatively large number of fishers/clients have paid deemed values for TAR 1 in each year, with the majority needing to cover relatively small quantities of catch. This is consistent with some fishers taking small amounts of tarakihi as an unavoidable bycatch when targeting other species.

68 Some fishers have, in several years, reported substantial quantities of TAR 1 as both target and bycatch. Fishers have balanced a large portion of that catch with ACE, but have also paid deemed values for further substantial quantities. It appears that those fishers have not found the current deemed value rates for TAR 1 to be a disincentive to catching well in excess of the available ACE. It is also evident that ACE prices can exceed the annual deemed value rate, weakening any incentive to obtain ACE or attempt to constrain catches.

69 MFish is reviewing the deemed value rates for TAR 1 (and other adjacent TAR stocks – see Volume 4) with a view to setting the rates at appropriate levels to achieve the purpose of the catch balancing regime. Altering the individual over catch threshold at which ramping of deemed values begins is an option being considered to constrain overfishing.

AMP proposals in TAR 1

70 Industry has, over a number of recent years, expressed its view that a utilisation opportunity exists in TAR 1 and has proposed AMPs to explore this potential. Northern Fisheries requested that a TACC increase be considered in the 2007 October sustainability round. Northern Fisheries provided its AMP proposal for a 43% increase to the current TACC in support of this request. MFish has previously advised that it will not be considering AMPs this financial year. Outside of an AMP framework, MFish considers that increases as large as 43% would need to be supported by reliable information that such an increase would maintain, or move the stock to a level at or above B_{MSY}.

71 Submissions on the IPP from the commercial fishing sector maintain that existing information suggests that the TAC in TAR 1 could be increased by significantly more than the options proposed by MFish. While not expressly seeking an AMP, these submitters argue that increasing the TACC to 2000 tonnes and implementing a range of catch spreading, research, performance and monitoring programs is a legitimate and sustainable utilisation opportunity. As expressed earlier, MFish has no information to suggest that increasing the TACC to 2000 tonnes would be sustainable or would maintain, or move the stock to a level at or above B_{MSY}.

Key points to consider

72 On balance, MFish considers that it is probable that the stock is at or above B_{MSY} but is currently lacking a full stock assessment to support this assumption. There are currently no estimates of the MSY for TAR 1.

73 The primary driver for this review is that the TACC has been fairly consistently exceeded for a number of years. The relatively stable commercial catch levels and indices of relative abundance (CPUE) available through to 2003-04 possibly support industry's view that the stock can provide for further sustainable utilisation above the current TAC. However, MFish does not agree with the commercial submitters' interpretation of existing information that the stock can support an increase to the TACC of 43%. The CPUE indices will be updated in 2008 and the results of a shed sampling program should become available from 2009. The 2007 Plenary report states that current catches and the TACC appear to be sustainable.

74 TAR 1 is a shared fishery, of importance to both customary and recreational fishers. Surveys to estimate recreational catches in 1996 and 1999-00 (although providing uncertain results) showed that the catches in TAR 1 were substantially larger than tarakihi catches in any other area. The 2007 Plenary report notes that the recreational catch estimated from the 1999-00 survey was 46% of the commercial catch in that period. As a shared fishery, setting TACs to maintain the stock above the B_{MSY} level is a valid objective. MFish notes also that the Auckland and Tauranga areas are experiencing substantial growth in human population. It is possible that an increasing regional population would be accompanied by increasing recreational interest in fishing for TAR 1 as well as increasing demand for the product by regional consumers.

75 In previous submissions on proposed AMPs in TAR 1, recreational interests expressed concern that an increase to commercial catch would impinge upon both the size and availability of tarakihi to recreational fishers. This was seen as particularly important in the areas where commercial and recreational interests are thought to overlap, primarily in the Bay of Plenty and East Northland areas. This was a contentious issue between commercial and non-commercial sectors in previous AMP applications in TAR 1.

76 With the exception of options 3a and 3b, the options proposed in the IPP would not see authorised commercial catch exceed recent actual catch levels (taken as the 10 year average of commercial landings) by more than 6 tonnes. If any of the options (other than 3a and 3b) were implemented, MFish considers that non-commercial sectors would be unlikely to see the nature and extent of their TAR 1 fishery reduced. If either options 3a or 3b were implemented, there is a greater risk of affecting the nature and extent of the fishery available to non-commercial sectors compared to the other options, though the level of this risk is unknown.

77 Given the lack of estimates of current stock size and MSY, and the uncertainty associated with the available estimates of non-commercial catches, the options proposed in this paper consider either no change or relatively small increases to the TAC based on recent levels of catch. The research information that will become available over the coming two years should enable a stock assessment. The imminent fisheries planning process will provide an appropriate open forum for stakeholders to develop their respective objectives for the TAR 1 fishery with the benefit of improved information.

Hauraki Gulf Marine Park Act 2000

78 In setting a TAC, you are required by section 11(2)(c) of the Act to have particular regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 in so far as the decision relates to the Hauraki Gulf. Section 7 recognises the national significance of the Hauraki Gulf including its capacity to provide for the relationship of tangata whenua and the social, economic, recreational, and cultural well-being of people and communities. Section 8 sets out the objectives of the management of the Hauraki Gulf, which include the maintenance of the Hauraki Gulf for the social and economic well-being and its contribution to the recreation and enjoyment of the people and communities of the Hauraki Gulf and New Zealand. The maintenance and enhancement of the physical resources of the Gulf, which include tarakihi, is also an objective.

79 Tarakihi is a shared fishery. Tarakihi is important to the customary, recreational and commercial sectors however, from a fishery perspective, due to its preference for deeper waters is not normally found in the inner Hauraki Gulf. Its value to fishers is therefore confined to locations of deep water, in particular east of Coromandel and the outer Hauraki Gulf.

80 Relatively little tarakihi is caught commercially in the inner Hauraki Gulf (Statistical Reporting Areas 006 and 007). Tarakihi is caught in slightly larger quantities in the outer Gulf and northeast of Great Barrier Island (Statistical Areas 004 and 005), and significantly larger quantities east of the Coromandel and into the Bay of Plenty (in areas 003, 008 and 009, though the Hauraki Gulf Marine Park only covers a relatively small part of areas 008 and 009).

81 MFish understands that the bulk of nationwide landings of tarakihi (approximately 6 000 tonnes) is sold on the domestic market and that it is a popular species with consumers. Only about 116 tonnes or 2 % of landings nationally were exported in the 2006 calendar year, mostly to Australia. MFish has no information to suggest that this is not also the case for commercial landings from TAR 1. The wellbeing of commercial fishers of tarakihi and of consumers who would purchase commercially caught tarakihi could benefit from an increase to the TACC. The primary benefit to commercial fishers would arise if the amount of annual catch entitlement (ACE) was greater and deemed value payments were reduced. However, the amount of any increase to catch limits proposed under any option in this paper is unlikely to have a significant effect on employment opportunities for commercial fishers or processors, or the supplies of tarakihi at local domestic fish markets.

82 MFish has no information to suggest that tarakihi in the Hauraki Gulf are more or less important to non-commercial fishers than tarakihi elsewhere. Commercial and recreational catch reports and surveys suggest that tarakihi are available in the marine park, particularly in the deeper, more easterly areas.

83 As a species of some importance to recreational fishers, an increase in the allowances could provide a wellbeing benefit to that sector. However, in the absence of information to suggest that the current allowances are insufficient for recreational and cultural wellbeing, MFish is not in a position to qualify or quantify the relative benefits of increases to the respective sectors.

Assessment of Management Options

Total Allowable Catch

84 The IPP proposed three options for reviewing the TAC for TAR 1. Option 1 proposed no alteration to the TAC, Option 2 proposed a 70 tonne increase and Option 3 a 140 tonne increase. The basis for these options has already been described in this report.

85 Pursuant to section 13(4) of the Act, MFish proposes that you set the TAC for TAR 1 under section 13(2)(a). This section requires a TAC to be set that maintains the stock biomass at or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks.

86 The 2002 Plenary reported that the TAR 1 biomass was probably above the level that can produce MSY, however, the 2007 plenary is silent on this matter. Currently available CPUE indices for TAR 1 (until 2003-04) are stable or increasing slightly, and commercial landings have been relatively stable for more than 15 years. The 2007 Plenary report states that, "based on relatively stable indices of abundance current catches and the TACC for TAR 1 appear to be sustainable."

87 In the absence of reliable estimates of biomass and MSY for TAR 1, MFish proposed the three options described previously.

88 Option 1 would result in no change to the TAC and represents the most cautious approach. This option recognises the fact that the existing TAC is unlikely to: risk the long-term sustainability of the fishery; significantly alter the ability of fishers from any sector to derive wellbeing from the fishery; or give rise to any other sustainability concerns. The effects of

altering the allocations under this option are addressed in the following section. However, retention of the existing TAC, if implemented in conjunction with a deemed value increase, is likely to result in a reduced commercial catch compared to recent years. This may result in direct effects on the commercial sector and as 60% of commercially caught tarakihi is sold on the domestic market, result in some flow-on social, cultural and economic effects to the community.

89 Option 2 proposed a 70 tonnes increase in the TAC. This is approximately equivalent to the average level of TACC over catch over the past 10 years. In terms of section 8 of the Act, such an increase would enable enhanced utilisation for the commercial sector in particular and based on population and catch indices, an increase of this quantum is likely to be sustainable. Although no MSY estimates are available, given such an increase recognises the level of catch that has been taken for several years, MFish considers that the increase to the TAC set out under this option would likely maintain TAR 1 at or above B_{MSY} (albeit with more risk than Option 1 that the TAC will not maintain the stock at or above B_{MSY}). Option 2 would most likely result in some social, cultural and economic benefits (in particular for commercial fishers), however, the size and nature of these effects would be dependent on the allocation option selected.

90 Option 3 proposed a 140 tonne increase to the TAC. This is approximately equivalent to the highest level of commercial over catch during the past 5 years. Catches have been at or near this level in three of the past 10 years. Such an increase would provide for greater utilisation at least in the short term. Option 3 would potentially provide greater social, cultural and economic benefits (in particular for commercial fishers). However, in the absence of a full stock assessment, MFish considers that this option provides the most risk of the three options proposed that the TAC will not maintain the stock at a biomass equal to or above B_{MSY} over time.

91 Finally MFish notes that, in overall terms, the difference between the options is relatively small in relation to the current TAC and TACC. The relative risk to sustainability associated with the any of the options is likely to be similarly small.

TACC and Allowances

92 Section 20 of the Act provides for you to vary the TACC for TAR1. In varying the TACC, section 21 of the Act requires you to have regard to the TAC and allow for Maori customary non-commercial interests, recreational interests, and other sources of fishing-related mortality. In undertaking this decision, by virtue of the purpose of the Act, you should consider how best to enable people to provide for their social, economic and cultural wellbeing.

93 Within each of the TAC options, the IPP contained three sub-options. Sub-option “a” proposes a proportional allocation across all sections. Generally the submissions from the commercial sector support proportional allocation. Sub-option “b” proposes allocating the TAC increase solely to the commercial sector and sub-option “c” proposed allocating half the increase to the non commercial sector and half to the commercial sector. Each of these sub-options poses different cost-benefit outcomes. MFish notes that SeaFIC supports sub-option “b” for the options presented in the IPP, though it maintains that greater increases need to be considered.

94 Under sub-option "a", all parties would receive either no increased benefit (Option 1a) or share any benefits equally (Options 2a and 3a). Sub-option "b" proposes a non-proportional allocation in favour of the commercial sector. Sub-option "c" proposes a non-proportional allocation in favour of the non-commercial sector, such that 50% of any TAC increase is allocated to the non-commercial sector and 50% to the commercial sector.

Commercial Utilisation

95 The table below provides an account of the potential changes to the commercial value of TAR 1 resulting from the options proposed. Option 1a is set at zero as this is based on the current TACC. These figures do not take into account the value of any fish taken above the level of the TACC, though it is probable that industry receive revenue from catch in excess of the TACC.

Approximate value to the commercial sector under different options:

	Sub-option	TAC	TACC	Approximate commercial value* of proposed TACCs
Option 1. TAC unchanged	a	1 959.195	1 399.195	0
	b	1 959.195	1 468.173	+$140 000
	c	1 959.195	1 320.839	-140 000
Option 2. TAC increase of 70 tonnes	a	2 029.195	1 447.483	+100 000
	b	2 029.195	1 467.188	+140 000
	c	2 029.195	1 432 705	+70 000
Option 3. TAC increase of 140 tonnes	a	2 099.195	1 495 759	+200 000
	b	2 099.195	1 536 153	+280 000
	c	2 099.195	1 467 188	+140 000

* based on the average port price of $2.00/ kg. Figures shown are independent of any alteration to deemed value.

96 Under option 1a, the TAC remains unchanged (1 959.195 tonnes) and the industry will receive no increased benefit. If fishing in excess of the TACC continues, industry will continue to bear the costs of deemed values. Moreover, if you recommend an increase in deemed values to $3.00 per kg as proposed in the deemed value review (this volume), based on the 2005/06 fishing year deemed value invoices could be approximately $114,000 (assuming that current over catch patterns do not change).

97 Option 1b retains the existing TAC, but proposes a realignment of allocation away from the non-commercial sector to the commercial sector. This reallocation would not cover all overfishing or bycatch, but would result in significant cost savings as the amount of deemed value invoices issued would be less. In addition, the industry would receive the added benefit of revenue generated from the sale of fish. There were no submissions supporting this option and whilst this option is available to you, it is not recommended.

98 Option 1c proposes a realignment of allocation within the existing TAC away from the commercial sector to the non-commercial sector. Given the level of over fishing and that much of this occurs in the SNA 1 fishery MFish considers that this option would add significant costs to the industry. Moreover, should the industry be able to reduce the level of bycatch and over fishing it would still face a loss of earnings of approximately $140 000.

There were no submissions supporting this option and whilst this option is still open for your consideration, MFish does not recommend it.

99 Under option 2a the TAC increases by 70 tonnes (to 2 029.195 tonnes). The level of TACC would increase, though not to the level of the average commercial catch for the past 10 years. Under this option, total deemed value payments should decrease as extra ACE will be available and approximately $100 000 of extra value should be realised by industry.

100 Option 2b proposes 70 tonnes be allocated to the commercial sector. Levels of deemed value payments should be reduced and returns would increase by approximately $140 000.

101 Option 2c proposes 70 tonnes be allocated non-proportionally, with the recreational and customary sectors receiving 35 tonnes, and industry and the allowance for other sources of mortality also receiving 35 tonnes. Under this option the industry would receive some benefit and, presuming it constrained overfishing and bycatch, returns could increase by approximately $70,000.

102 Under option 3a the TAC would increase by 140 tonnes (to 2 099.195 tonnes) and allocated proportionally, with industry receiving approximately 96 tonnes. Assuming similar trends in catch levels and that all ACE is traded, there could be few or no deemed value payments necessary in TAR 1 under this option. Based on current port prices, revenue would increase by approximately $200,000.

103 Option 3b proposes 140 tonnes be assigned solely to industry and the OSM allowance. The level of the TACC would be greater than the annual catch for all but one of the last eight years. This option would provide the greatest return to the industry at approximately $280,000.

~~104~~ Option 3c proposes that the 140 tonnes be allocated non-proportionally, with the industry (and OSM allowance) receiving 70 tonnes. It is probable that total deemed value payments would be reduced and returns to industry could increase by approximately $140,000.

105 If an increased deemed value is adopted, such that it precludes "deemed value fishing", and putting sustainability issues aside, then:

a) If it is desired to enable commercial fishers to take the equivalent of the average commercial catch over the past 10 years, then Option 2b should achieve this.

b) If it is desired to enable commercial fishers to take the equivalent of the maximum annual commercial catch recorded in the past 10 years, then Option 3b should achieve this.

Recreational

106 Under option 1a, 2b and 3b there would be no change to the recreational allowance. MFish currently has no information to suggest that the existing allowance for the recreational sector does not allow for recreational fishers' interests in TAR 1. MFish notes that one recreational submitter (NZBGFC) expressed that the current recreational allowance appeared to be adequate, while no other submitter commented on this issue.

107 Option 1b proposes a cut to the recreational allowance. There were no submissions in support of this option and whilst this option is available MFish does not recommend it.

108 Options 1c, 2a, 2c, 3a and 3c all propose increases to the recreational allowances ranging from 73 to 80 tonnes. If the recreational allowance was increased, MFish considers that any change to the daily recreational bag limit is unlikely to be necessary. There is no information available to suggest that 20 tarakihi (tarakihi is included in the 20 mixed-species bag limit) is insufficient in providing for the needs of recreational fishers. Instead, an increased allowance would allow for the taking of more daily bag limits over the course of a season. However, as noted above, there was little support from any sector for increasing the recreational allowances.

Customary

109 Little is known about the extent of customary catch of tarakihi. While tarakihi is known to have value as a customary food source, recent and current harvest levels are unknown. Thus, there is no information presently available to suggest that the current allowance of 70 tonnes does not provide for customary catch. No new information about customary catch was supplied in submissions on the IPP.

Other Fisheries-Related Mortality

110 No quantitative information is available on the level of illegal or unreported catch, or other sources of mortality in the TAR 1 fishery. The primary method of catch for tarakihi is bottom trawl, and therefore some mortality can be expected where tarakihi escape through the net, but are fatally injured. As a minimum legal size applies, mortality must also be associated with the capture and release of undersized fish. In 2002, the Minister set an allowance of 20 tonnes within the TAC to cover other sources of mortality across all sectors.

111 MFish considers that the allowance for other fishery-related mortality should be increased in proportion to any increase in the TACC and allowances. MFish considers it should be set at 1.5% of the TACC.

Statutory Considerations

112 **Section 13:** As discussed in the body of the paper, MFish considers that the options presented in this paper are consistent with section 13(2)(a) which requires the TAC to maintain the biomass of the stock at or above the level that can produce MSY. Based on relatively stable catches and CPUE data, MFish considers that the TAC options presented in this paper are likely to maintain TAR 1 at a level which can produce MSY and be sustainable, at least in the short term.

113 With regards to the interdependence of stocks, a range of species are caught in the target trawl fishery for TAR 1. The three most significant commercial bycatch species reported in the TAR 1 target bottom trawl fishery in 2005-06 were snapper (9%), barracouta (7%) and hoki (3%). All these species are managed under the QMS with strong incentives to balance catches to the available ACE. The options proposed in the report are modest and are unlikely to result in any effect on the interdependence of stocks.

114 **Sections 5(a) and 5(b):** There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish

considers that the section 5 considerations arising from New Zealand's international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 is adequately addressed by management proposals for TAR 1. MFish is not aware of any issues concerning those international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 that will result from the proposed TACs, TACCs and allowances.

115 **Section 8:** The purpose of the Fisheries Act 1996 is to provide for the utilisation of fisheries resources while ensuring sustainability. Utilisation is defined in the Act as including using and developing fisheries resources.

116 In relation to considering the appropriate TAC options, MFish considers you must weigh up providing for the utilisation of tarakihi with ensuring the sustainability of tarakihi – however, ensuring sustainability is the bottom line and the ultimate objective. You must be satisfied that your decision will ensure sustainability while providing for utilisation. This does not require the selection of option 1; given the uncertainty of information, you must exercise your judgement, and may determine that options 2 or 3 satisfy your obligation with respect to sustainability.

117 The options for the TACC and allowances recognise the development potential of the fishery (as evidenced by catch history and indices of stock abundance), and create the potential for people to provide better for their social, cultural, and economic wellbeing. People can achieve this well being through the utilisation of commercial, recreational and customary fisheries. In terms of allocation, these factors are discussed in more detail in paras 92-109 in the *"TACC and Allowances*" section.

118 An increase to the TAC could increase the value able to be extracted from this fishery. In doing so you may potentially be increasing risk to stock sustainability, although MFish considers the level of risk to sustainability from the three proposed options to be low. MFish has also implementing a research and monitoring programmes for TAR 1 over the next few years. This will provide information that will enable MFish to identify and manage any risks in the near term.

119 TAR1 is an important shared fishery. Utilisation, in this context, must mean the ability of all sectors to have a reasonable opportunity to utilise the fishery. An over-generous allocation to one sector may impede reasonable utilisation by other sectors and therefore may impede the proper purpose of the Act. Given the lack of information on TAR 1, MFish considers the purpose of the Act would be best met by a relatively cautious approach to increasing the TAC. The options proposed meet this criterion.

120 The management options presented provide for different levels of utilisation through the setting of catch limits and allowances. Given that the options propose increasing the TAC through option 1 (nil increase) to option 3 (140 tonnes increase), it is likely that the sustainability risk will also increase. In the absence of information, the smaller increases provide some degree of increased certainty that the level of harvest is sustainable over the long term. Having stated this, the relative risk to sustainability across the three options is not significant.

Economic wellbeing and factors

121 The TAR 1 catch is New Zealand's second largest after TAR 2, taking about 23% of the total tarakihi landings. The commercial fishery appears to have a seasonal peak in Autumn and winter, although substantial landings are made throughout the year.

122 The TAR 1 fishery is a significant contributor to the $650,161 export value (2006) of tarakihi. Of the various export states, 78% by value (or 67% by weight) of tarakihi is either chilled or frozen fillets. It is not possible to determine the percentage of TAR 1 that is exported as fillets (as opposed to a less-processed state), but if it is significant, then there would be substantial shore-based value-added for the TAR 1 catch.

123 MFish notes that there is significant domestic market for tarakihi but has little information on the value of this to the commercial sector. However, given the returns per kilo overseas MFish concludes that it is a lucrative market.

124 The TACC limit reductions proposed under Option 1c will have a direct economic effect on industry participants. Applying the port price ($2.00/kg for 2005/06) and average export price ($5.58/kg in 2006), the TACC reduction under Option 1c (to 1329 tonnes) provides an expected gross landed value of $3.44 million and export value of $2.65 million. This represents a reduction of 5% compared to Option 1a (this presumes the full TACC was caught – however, the TACC has been over caught by about 5% caught over the past 10 years.

125 The increase in the TACC proposed through Options 2 and 3 has the potential to reduce deemed value payments. These have already been described in the report. The option that provides the greatest TACC increase (option 3b) is likely to result in the greatest reduction in deemed value payment and hence the greatest benefit to the commercial entities.

Social and Cultural wellbeing and factors

126 Catch reductions can have social implications when employment opportunities for catching and processing staff are reduced. The information MFish has on the impact on employment that might arise from option 1c are unknown. Conversely any of the options that propose increases in the TACC will likely result in social and cultural benefits.

127 The greater the increase in the TACC the greater the economic benefits from the proposal. These benefits are likely to result in increased flow-on social and economic benefits to the associated industries and the community. To be of greatest benefit, the TAC (and any corresponding TACC) increases needs to be sustainable in order to provide longer term benefits. All the options proposed in this paper are considered to be sustainable, however due to a lack of a stock assessment, it should be recognised that there is increasing risk with the larger TAC and TACC proposals.

128 Tarakihi is an important recreational resource, and is actively targeted in many areas. Both the 1996 and 2000/01 recreational harvest surveys recorded TAR 1 is the most important tarakihi fishery by weight of catch. It was also estimated to be the 4th most important recreational fishery nationally (of any fish species, by weight) in the 1996 recreational harvest survey and 9th most important in the 1999/2000 survey.

129 Based upon information provided by recreational fishers, the East Northland and Bay of Plenty areas are important areas to recreational fishers in TAR 1. In contrast, discussions with recreational fishers in 2003 did not reveal that there was much target fishing for tarakihi on the west coast of TAR 1.

130 MFish currently has no information to suggest that the existing allowance for the recreational sector is constraining recreational fishers' interests in TAR 1. Option 1b reduces the recreational allowance but MFish has no data that supports whether or not this would limit the current catch by the recreational sector.

131 As stated earlier, little is known about the extent of customary catch of tarakihi. While tarakihi is known to have value as a customary food source, recent and current harvest levels are unknown.

132 In considering the options presented in this paper, is it important to ensure that any of the options that propose TACC increases do not reduce the social and cultural benefits of the fishery to recreational or cultural interests. Given the level of the proposed increases, it is considered that none of the options prose such a risk. However, again it is noted that the there is a lack of information on TAR 1 and that the greater increases prose a greater level of risk.

133 **Sections 9(a):** provides that decision makers must take into account the principle that associated or dependent species (non-harvested species) should be maintained above a level that ensures their long-term viability. There are no known interactions between the existing TAR 1 fishery and non-harvested species that are of concern or specific to the fishery. The fishery does not dispose of any significant amount of fish waste or offal at sea, so the potential for interactions with seabirds is reduced. The National Plan of Action to Reduce the Incidental By-Catch of Seabirds in New Zealand Fisheries (April 2004) document does not list tarakihi as one of the fisheries with seabird interactions that are of concern. The options proposed in this paper do not contemplate increased fishing beyond recent levels.

134 **Section 9(b):** provides that decision makers must take into account the principle that the biological diversity of the aquatic environment should be maintained. MFish notes that an area off Spirits Bay in the far north is closed to trawling generally as a measure to avoid the adverse effects of fishing on the unique biodiversity there. There are no other known impacts on biodiversity that would be specific to the TAR 1 trawl fishery. Reporting of bycatch and protected species will allow for information to be collected to advance our knowledge of potential impacts.

135 **Section 9(c):** provides that decision makers must take into account the principle that habitats of particular significance to fisheries management should be protected. No habitats of particular significance to fisheries management have been identified that might be affected by trawling for tarakihi in TAR 1.

136 **Section 10:** The information principles of the Act require that decisions be based on the best available information, taking into account any uncertainty in that information, and applying caution when information is uncertain, unreliable, or inadequate. Section 10 also requires that you take into account the principle that the absence or uncertainty of information should not be used as a reason to postpone, or fail to take, any measure to achieve the purpose of the Act. MFish considers that the information used to support the TAR 1 proposals is the

best currently available. It is also recognised that TAR 1 is an information poor fishery and that the options proposed meet the requirement of this section.

137 Estimates of the current biomass and the level that will produce MSY for TAR 1 are not currently available. The proposed management options are based largely on information derived from:

- recent and current commercial catches
- CPUE indices from commercial reporting
- estimates of recreational catch from the 1996 and 2000/01 recreational harvest surveys.

138 CPUE indices provide an indicator of relative abundance, but are inadequate to determine absolute stock size. Relatively stable CPUE indices suggest that the underlying stock biomass has not changed under recent and current catch levels, but actual stock size remains unknown at this time.

139 In the absence of a stock assessment, the catch history and CPUE indices provide the best available information on which to base considerations of opportunities and risks to TAR 1. However, the absence of estimates of biomass and MSY suggest caution when setting the TAC. The importance of TAR 1 as a shared fishery is also a consideration in terms of Section 10, in that a significant increase for one sector may impede the proper utilisation of the fishery by other sectors.

140 **Section 11(1)(a):** Before varying the TAC for TAR1, you must take into account any effects of fishing on any stock and the aquatic environment. The commercial fishery for tarakihi is largely a target trawl fishery but tarakihi are also in substantial quantities as a by-catch of target trawling for other inshore species including snapper. Tarakihi are also taken by other commercial fishing methods. Bottom trawl gear affects the physical structure of the substrate and possibly the benthic community structure. Target trawling occurs throughout TAR 1, largely between the 100 and 200 metre depth contours. Due to ease of catch and proximity to processors, commercial fishers are likely to continue fishing in the same fishing grounds, and so effects are likely to be restricted to areas that have been trawled previously. Despite that, fishing might still have adverse effects. The extent of those effects is not known. Nevertheless, MFish considers that restricting any adverse effects of fishing to existing trawl areas is not inconsistent with the obligation to provide for the utilisation of fishery resources while ensuring sustainability. No other information about any effects of fishing on any stock or on the aquatic environment is considered relevant to the consideration of sustainability measures for TAR 1 at this time. Recreational and customary fishers general use line methods which are non destructive to bottom environments.

141 **Section 11(1)(b):** Before varying the TAC for TAR 1, you must take into account any existing controls that apply to the stock. Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls for TAR 1 include the following:

- A minimum legal size of 25 cm fork length and a minimum net mesh size of 100 mm apply in TAR 1 for both commercial and non-commercial fishers;

- Tarakihi is one of the species that is subject to the recreational fishing combined finfish daily bag limit of 20 fish in the Auckland and Kermadec Fishery Management Areas; and

- Trawling is prohibited by fisheries regulation in large areas of the inshore zone within TAR 1. These areas include the waters in and adjacent to specified harbours, bays, and the inner Hauraki Gulf (see the Fisheries (Auckland and Kermadec Areas Commercial Fishing) Regulations 1986). On the west coast, trawling is excluded within 1 nm of the coast from Tirua Point northwards to Scott Point at the northern end of 90 Mile Beach. At harbour entrances and major river mouths on the west coast, trawling is also excluded from 'bubbles' of a 2 nm radius around the entrances/mouths. In the Bay of Plenty, trawling is excluded from an area within 2 nm of the coast from Homunga Bay to Cape Runaway. However, MFish considers that most of these areas are not prime habitat for tarakihi, which is generally found at depths of 100-200 metres.

142 **Section 11(1)(c):** Before varying the TAC for TAR 1, you must take into account the natural variability of the stock. Tarakihi are a relatively long-lived species, such species tend not to be prone to significant fluctuations in biomass. The 2007 Plenary report states that good recruitment was a likely reason for an increase in the CPUE index for the Bay of Plenty area in 2000-01. Whilst some variability in recruitment is likely to occur, the biomass indices used by MFish to determine population size are considered robust and natural variability is unlikely to be a significant issue in determining an appropriate level for the TAC. The options proposed are appropriate in the context of this section

143 **Sections 11(2)(a) and 11(2)(b):** Before varying the TAC for TAR 1, you must have regard to any provisions of any regional policy or plan under the Resource Management Act 1991 and any management strategy or plan under the Conservation Act 1997 that apply to the coastal marine area and you consider relevant. TAR 1 incorporates parts of four regional council areas and four Department of Conservation conservancies. There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for TAR 1.

144 **Section 11(2)(c):** Before varying the TAC for TAR 1, you have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act that apply to the coastal marine area and you consider relevant. Relatively little target fishing for tarakihi is known to occur within the boundaries of the Hauraki Gulf Marine Park (HGMP), and the HGMP forms only a small proportion of TAR 1. Nevertheless, the proposals are considered to be consistent with the considerations set out in sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 (HGMPA). Sections 7 and 8 of the HGMPA relate to the consideration of the social, economic cultural and recreational wellbeing of people of the Hauraki Gulf and of New Zealand generally. The proposed TAC options seek to provide for levels of utilisation that will enable people to derive social, economic, cultural and recreational wellbeing from the fishery to varying degrees (depending on the option) while ensuring the sustainability of the broader stock. Those considerations are discussed in more detail in the body of the paper.

145 **Sections 11(2A)(a) and 11(2A)(c):** Before varying the TAC for TAR 1, you must take into account the effects of any conservation services or fisheries services and any decisions not

to require conservation or fisheries services. The review of the TAC and associated allowances for TAR 1 is independent of any conservation services. MFish does not consider that existing or proposed services materially affect a TAC review for TAR 1. No decision has been made not to require a service that would be relevant to the TAR 1 fishery.

146 **Section 11(2A)(b):** Before varying the TAC for TAR 1, you must take account of any relevant fisheries plans. There are no approved fisheries plans relevant to TAR 1. A fisheries plan could provide another mechanism through which to explore the potential of the TAR 1 fishery and implement sustainability measures. MFish has recently stated that it intends all fish stocks to be incorporated into fisheries plans over the next five years. It is likely that TAR 1 would be included in one (or several) of the northern finfish plans. However, at present no such plan has been completed.

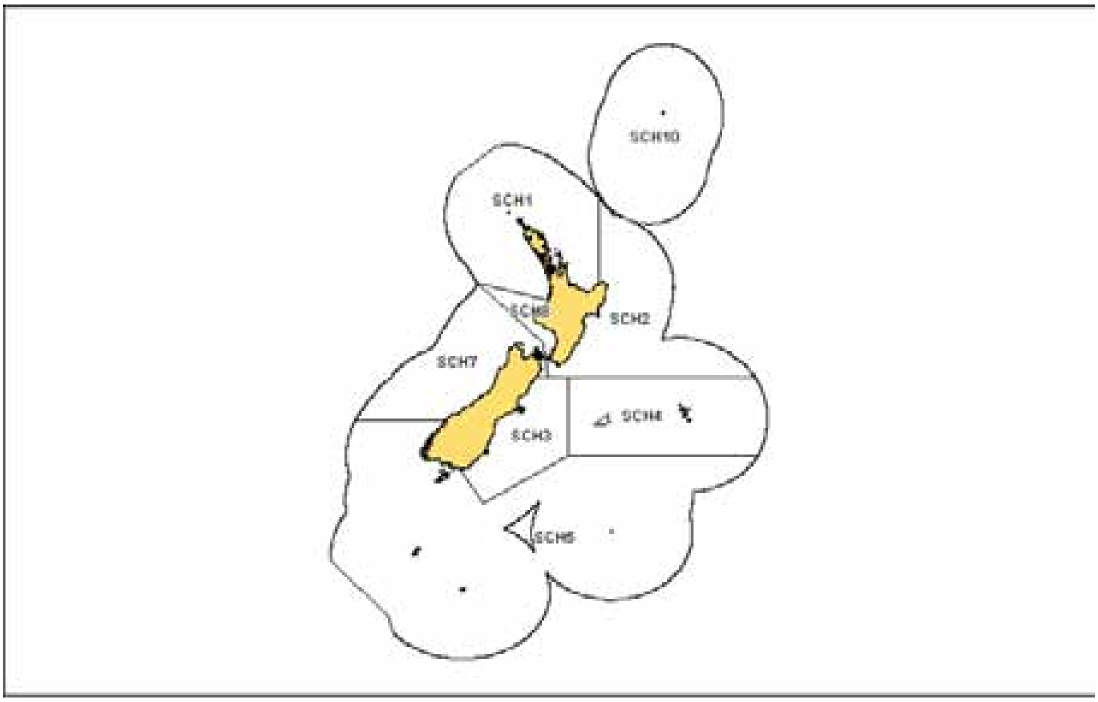
147 **Sections 21** specifies a number of matters that must be taken into account when setting or varying a TACC. The IPP and this paper include three options for TAC settings for TAR 1. Within each of these TAC options, the paper proposes three sub-options that consider a variety of allocation options, including proportional and non proportional options in favour of the commercial and non-commercial sectors. The social, cultural and economic costs and benefits have been assessed in each case.

148 **Section 21(4)** requires that any mātaitai reserve or closure/restriction under s 186A to facilitate customary fishing be taken into account. One mātaitai reserve exists in TAR 1 at Raukokere however, MFish considers that this reserve has little if any effect on the options proposed for TAR 1. Three areas are subject to section 186A closures under the customary fishing provisions of the Act, at Ohiwa Harbour (green-lipped mussels closure), Mount Maunganui (green-lipped mussels closure), and Kaipara Harbour (scallops closure). Tarakihi are unlikely to be found within the area of any of these closures, however, MFish considers such small closures also have little if any effect on the options proposed for TAR 1.

149 **Section 21(5)** requires that any regulations to prohibit fishing made under s 311 be taken into account when setting allowances for recreational interests. No restrictions have been placed on commercial fishing in any area within the TAR 1 under section 311.

SCHOOL SHARK (SCH 1) - FINAL ADVICE

Figure 1: QMAs for SCH 1 and other school shark stocks



Executive Summary

1 This paper provides final advice to you on:

a) setting the total allowable catch (TAC) for SCH 1 under section 13(2)(a) of the Fisheries Act 1996 (the Act); then

b) setting the total allowable commercial catch (TACC) under section 20 of the Act after allowing for customary and recreational fisheries, and other sources of fishery-related mortality, as required by section 21 of the Act.

2 No TAC is currently set for this stock, though a TACC of 668.47 tonnes has been in place since 1986. Commercial stakeholder organisations (CSOs) applied for this TACC to be increased under an adaptive management program (AMP)[76] earlier this year. After confirmation that MFish was not accepting new AMP applications, the Northern Fisheries Management Stakeholder Company Ltd (Northern Fisheries) requested that a TACC increase be considered in the October 2007 sustainability round.

3 In the Initial Position Paper (IPP), released for consultation on 15 June 2007, MFish proposed to set a TAC for SCH 1 at a level that either: reflects the current TACC of 668.47 tonnes and estimates of non-commercial catches (option 1); or is above the current limits to

[76] Adaptive management programmes are programmes under which commercial catch limits are increased in return for commercial fishers recording far more detailed information on things like fishing locations, fishing effort and size of fish caught. This information is then used to develop understanding of the status and biology of the stock concerned.

reflect commercial landings in the past five years (27 tonne increase, option 2) or the past ten years (78 tonne increase, option 3).

4 Option 1 would, most likely, if combined with an increase in the deemed value for the stock, better constrain commercial fishing of SCH 1 to the level of the current TACC. This option places the greatest weight on the uncertainty of the current information regarding stock status and takes the most cautious approach in favour of sustainability. This option minimises the risk that the stock will not be maintained at or above B_{MSY}.

5 Options 2 and 3 would set a TAC that reflects past commercial catches and provides for commercial catches above the current level of the TACC. Under option 2, commercial catches would most likely remain at about their recent level, although higher than in the 2005/06 fishing year, and deemed value payments would be reduced. Under option 3, commercial catches would most likely increase above their recent level, providing a utilisation opportunity. These options place more weight on short-term utilisation. Although increasing the TAC to reflect past commercial catches is not likely to pose a sustainability risk in the short-term, the longer term sustainability risks are unknown and are higher than for option 1. A higher TAC increases the risk that the stock will not be maintained at or above B_{MSY}.

6 Commercial landings of SCH 1 were consistently above the TACC from 1995/96 to 2004/05 (inclusive). The average of landings in the last five years is significantly lower than the average of landings in the last 5-10 years, probably due to the effect of deemed values. Landings fell below the TACC in 2005/06, at least partially because a reduction in the SNA 8 TACC led to less school shark being taken as bycatch in the snapper fishery. Commercial respondents to the IPP considered that there are additional utilisation opportunities in the SCH 1 fishery.

7 There are inherent sustainability risks associated with fishing for school shark and gaps in our knowledge about the SCH 1 stock. We do not have any estimates of school shark biomass. School shark is a species that is late maturing, slow growing with low fecundity and productivity and it is predicted to have a slow rate of recovery from over-fishing (rebound potential). The rebound potential of school shark from fishing pressure has been assessed as amongst the lowest for shark species. School shark around New Zealand is considered to be a single biological stock so any changes in catch limits for one stock area are likely to affect the stock as a whole. Recreational and environmental respondents consider that the lack of knowledge about the stock and the vulnerability of school shark to fishing pressure mean that the TACC should not be increased.

8 New research data on school shark CPUE will be available later this year although it is uncertain how reliable this new information will be. Unfortunately this research data will not be available in time to inform your decision this year.

9 The habitat of school shark in SCH 1 overlaps with the habitat of Maui's dolphin. The IPP noted that increasing the SCH 1 TACC could increase the risk of Maui's dolphin interaction with fishing gear. Commercial respondents did not agree that any increased TACC would affect Maui's dolphin and thought that any risk of increased interaction with Maui's dolphin would be more appropriately dealt with through the joint MFish/Department of Conservation Threat Management Plan to mitigate the risks to Maui's dolphin. They argue that Maui's dolphin do not currently interact with commercial fishing operations in SCH 1 due to a combination of spatial separation and current regulations.

10 Environmental respondents noted that much of the quota for school shark is caught in set nets, which poses particular problems for non-target bycatch species such as dolphins and called for fishing restrictions within the range of Maui's dolphin. MFish does not consider that the setting of a TAC for this one stock is the best way to deal with fishing-related threats to Maui's dolphin. Options set out in the Threat Management Plan will apply to school shark fisheries as well as to other fisheries in the range of Maui's dolphin.

11 In the IPP, MFish proposed to set allowances for recreational and customary fishing and other fishing-related mortality based on estimates of existing catches. MFish considers that it may be appropriate in this case, if you were to increase the SCH 1 TAC above the level envisaged in option 1, to allocate that increase entirely to the TACC. This is because the TAC is being set for the first time, there are no existing customary or recreational allowances to increase, and the estimates of current recreational and customary catch are considered to provide in full for the catches of those sectors.

Summary of Options

Initial Proposal

12 The IPP proposed the following options:

Table 1: SCH 1 management options (tonnes)

Option	Allowance Approach	TAC	Recreational Allowance	Customary Allowance	Other fishing related mortality	TACC
Option 1. TAC set at current limits	Not applicable	866	66	99	33	668.47
Option 2. TAC increase of 27 tonnes	Proportional	893	68	102	34	689
	Non-proportional	893	66	99	35	693
Option 3. TAC increase of 78 tonnes	Proportional	944	72	108	36	728
	Non-proportional	944	66	99	37	742

h) *Option one*: current TACC plus allowances. Option 1 proposed that the TAC for SCH 1 be set at 866 tonnes. This option would provide for the existing TACC of 668.47 tonnes, plus allowances for customary and recreational fishing and other fishing-related mortality. This option was supported by ECO, NZ Big Game Fishing Council, NZ Recreational Fishing Council, Nga Hapu o Te Uru and Forest & Bird.

i) *Option two*: increase by level of average commercial catches above the TACC in the past 5 years. Option 2 proposed that the TAC for SCH 1 be set at 893 tonnes, an increase of 27 tonnes above option 1. A TAC of 893 tonnes would reflect the average reported commercial landings in the past five years, plus allowances for customary and recreational fishing and other fishing-related mortality. Within this option you may choose to allocate the increase proportionally to all sectors or non-proportionally in favour of one sector. This option was supported by Te Runanga o Te Rarawa, who supported a proportional allocation of the increase.

j) *Option three*: increase by level of average commercial catches above the TACC in the past 10 years. Option 3 proposed that the TAC for SCH 1 be set at 944 tonnes, an increase of 78 tonnes above option 1. A TAC of 944 tonnes would reflect the average reported commercial landings in the past ten years, plus allowances for customary and recreational fishing and other fishing-related mortality. Within this option you may choose to allocate the increase proportionally to all sectors or non-proportionally in favour of one sector. No respondent supported this option. However, Sanford Ltd and Northern Fisheries Stakeholder Management Company Ltd, supported by SeaFIC, advised that they would support an altered option three with a TACC increase of 100 tonnes.

Final Proposal

13 The options available for consideration are unchanged from the IPP:

a) **AGREE** to:

Option 1: Set the SCH 1 TAC at 866 tonnes with the TACC (unchanged) at 668.47 tonnes and allowances of 99 tonnes for customary, 66 tonnes for recreational and 33 tonnes for other fishing-related mortality.

OR

b) **AGREE** to:

Option 2: Set the SCH 1 TAC at 893 tonnes;

AND

Allocate the TAC proportionally, with the TACC set at 689 tonnes (21 tonne increase), and allowances of 102 tonnes for customary fishing, 68 tonnes for recreational fishing and 34 tonnes for other fishing-related mortality;

OR

Allocate the TAC non-proportionally with the TACC set at 693 tonnes (25 tonne increase), and allowances of 99 tonnes for customary fishing, 66 tonnes for recreational fishing and 35 tonnes for other fishing-related mortality.

OR

c) **AGREE** to:

Option 3: Set the SCH 1 TAC at 944 tonnes;

AND

Allocate the TAC proportionally with the TACC set at 728 tonnes (60 tonne increase), and allowances of 108 tonnes for customary fishing, 72 tonnes for recreational fishing and 36 tonnes for other fishing-related mortality;

OR

Allocate the TAC non-proportionally with the TACC set at 742 tonnes (74 tonne increase), and allowances of 99 tonnes for customary fishing, 66 tonnes for recreational fishing and 37 tonnes for other fishing-related mortality.

14 The options above are presented for your consideration. It is open to you to choose an alternative option that you believe is appropriate. However if you wish to consider TAC and TACC options outside the range proposed in the IPP, MFish considers further consultation would be required with stakeholders before a decision on such measures could be taken. As a consequence, such measures could not be implemented prior to the commencement of the 1 October 2007/8 fishing year. MFish is happy to provide you with additional advice on these options should you wish to consider these matters further.

Consultation

15 Your decision whether or not to adjust the TAC for SCH 1 is a decision under section 13(2)(a) of the Act and therefore the consultation requirements of section 12 apply.

16 Consultation on the IPP was undertaken with such persons or organisations representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned, including Maori, environmental, commercial, and recreational interests. Further, provision was made for the input and participation of tangata whenua having a non-commercial interest in the stock or an interest in the effects of fishing on the aquatic environment in the area concerned, having particular regard to Kaitiakitanga.

17 In addition, analysts from MFish's Auckland office presented the SCH 1 IPP at meetings of the Te Hiku o Te Ika (Far North Regional Iwi Forum), Mai I Nga Kuri a Wharei ki Tihirau (Bay of Plenty Regional Iwi Forum) and Nga Hapu o Te Uru (western Tainui Regional Iwi Forum). These forum presentations provided members of the forums with the opportunity to discuss these issues in depth with MFish staff and to lodge a submission if they felt it necessary.

Submissions Received

18 Submissions regarding this proposal were received from:

- Environmental and Conservation Organisations of New Zealand (ECO)
- New Zealand Big Game Fishing Council (NZBGFC)
- New Zealand Recreational Fishing Council (NZRFC)
- Nga Hapu o Te Uru (NHOTU)

- Northern Fisheries Management Stakeholder Company Ltd. (Northern Stakeholder Group)

- Royal Forest and Bird Protection Society of New Zealand (Forest & Bird)

- Sanford Ltd. (Sanford)

- Seafood Industry Council (SeaFIC)

- Te Runanga o Te Rarawa (Te Rarawa).

Key Issues Raised

Absence of an Adaptive Management Programme proposal

Stakeholder view

19 Commercial respondents were disappointed that the range of options presented in the IPP did not include a Northern Stakeholder Group proposal (made prior to IPP drafting) for a 167 tonne TACC increase under an AMP. This proposal included components for increasing collection of data about the fishery such as a logbook programme.

MFish response

20 The Northern Stakeholder Group's proposal was not included in the IPP as MFish had previously advised stakeholders that AMP applications were not being considered. Further, MFish is not aware of any information to suggest that an increase to the TAC sufficient to accommodate a 167 tonne increase to the TACC would be sustainable. MFish considers that a TAC increase of that size would pose an unacceptably high risk that the stock will not be maintained at or above B_{MSY}. MFish also considers that discussions of data collection in a fishery would be better addressed through a fisheries plan.

Proposal for a 100 tonne TACC increase

Stakeholder view

21 Commercial respondents now propose a TACC increase of 100 tonnes. They consider that:

- the fishery could be managed in a similar fashion to an AMP through an industry-led, structured fisheries plan

- this would have provided opportunity for incorporating voluntary management measures to address shark biological concerns (such as pupping females in the Kaipara Harbour) and catch spreading and effort to address environmental and spatial depletion concerns

- there are utilisation opportunities available in the SCH 1 fishery

- no real increases in commercial catch above what has been caught in recent years are envisaged under options 1 and 2, indeed commercial catches may fall under option 1 if deemed values are increased.

- option 3 provides for no real increase in commercial catch if 10-year commercial catch figures are used

- it is unlikely that the adverse impacts of increasing the TACC that were discussed in the IPP will occur as the options provide for no real increase in the commercial catch levels above what has been caught in the past 5-10 fishing years.

MFish response

22 MFish notes that option 1 is not intended to provide for increased commercial catches but to provide an option for retaining the current TACC. Options 2 and 3 provide for increased TACCs based on past commercial catches of school shark. There is no information to justify TAC increases above the levels of options 2 and 3. As catches at the levels envisaged in these options have been taken relatively regularly in the past, it may be that setting the TAC at these levels will not increase any adverse impacts of fishing for school shark. However, a higher TAC increases the risk. Also, given the SNA 8 TAC reduction, the amount of SCH 1 taken as trawl bycatch may reduce while the amount taken by targeted set-net fishing may increase.

Opposition to any TACC increase

Stakeholder view

23 Non-commercial respondents saw no justification for increasing the TACC for a range of reasons. These included:

- the biological characteristics of the species and its vulnerability to fishing pressure

- the lack of information about the species other than the level of past commercial over-catch

- the fact that new research is currently being developed on school shark CPUE which will be available later in 2007, but too late to inform this decision

- the risk that increasing the TACC based on catch in excess of quota and "chronic deeming" rewards overfishing and provides the wrong incentives to commercial fishers

- the lack of any guarantee that increasing the TACC would stop the commercial over-catch – commercial fishers may just catch in excess of the higher TACC

- the estimate of combined Maximum Constant Yield (MCY) for most school shark stocks (SCH 1, 2, 3, 7 and 8) in New Zealand being just 325 tonnes, much lower than the 2434 tonne combined TACC for these stocks

- the risks of increased fishing for school shark on non-target by-catch species such as dolphins and sea-birds.

MFish response

24 MFish considers that the catch data is part of the best available information on SCH 1. MFish also considers that setting a TAC is not about rewarding overfishing but about setting

a catch limit that meets the requirements of the Act and is sustainable. MFish notes that the MCY data referred to was developed in 1989 using data from 1955 to 1975, when the fishery was not fully developed, and that this method has been superseded in this fishery by CPUE studies. The biological risks and bycatch risks of fishing for school shark were taken into account when options 1 – 3 were developed. Also, as options 2 and 3 reflect past catches the risks of those options may not be significantly different from those that already exist in the fishery.

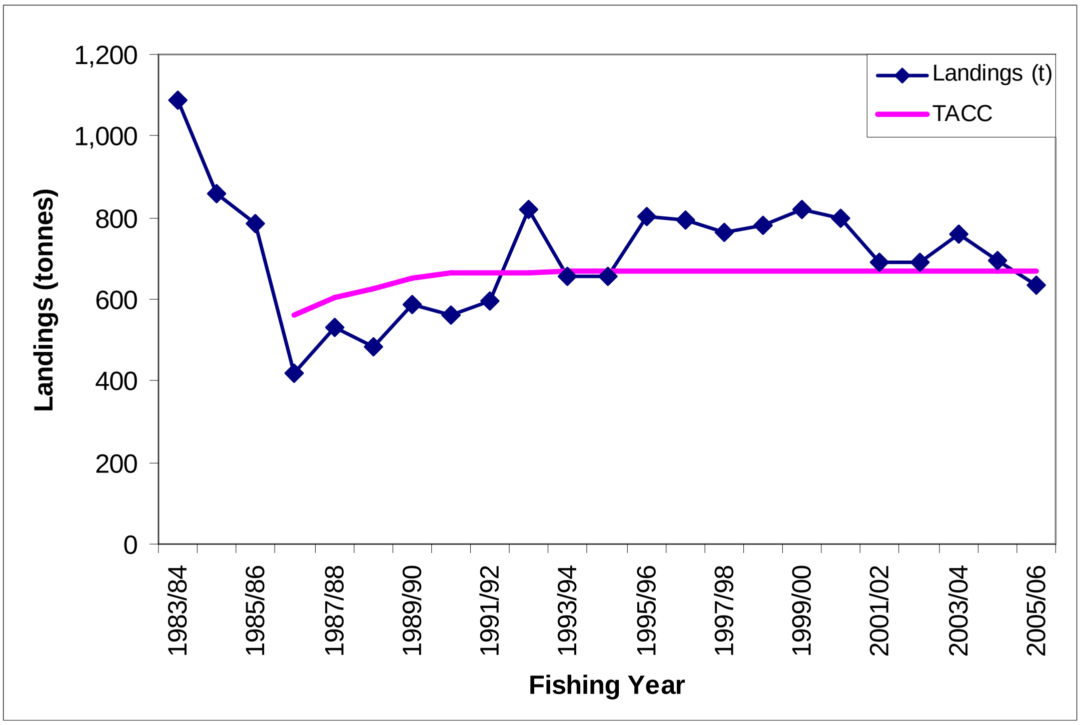
Rationale for Management Options

Current and recent commercial catches

25 Commercial stakeholders have advised that they believe there are utilisation opportunities in the SCH 1 fishery. Commercial stakeholder organisations (CSOs) applied for this TACC to be increased under an adaptive management program (AMP) earlier this year. After confirmation that MFish was not accepting new AMP applications, the Northern Fisheries Management Stakeholder Company Ltd (Northern Fisheries) requested that a TACC increase be considered in the October 2007 sustainability round.

26 Commercial landings of SCH 1 have exceeded the TACC in all fishing years since 1994/95 except for 2005/06 (see Figure 2). The extent of overcatch has reduced since 2001, constrained by deemed values introduced under the Fisheries Act 1996.

Figure 2: SCH1 landings and TACC 1983/84 – 2005/06



27 Advice from commercial stakeholders suggests that the fall in landings in 2005/06 was because the SNA 8 TACC reduction in 2005/06 led to less school shark being taken as bycatch in the snapper fishery. MFish data[77] partially support this by showing that catches of SCH 1 when snapper was the target species fell by 27 tonnes between 2004/05 and 2005/06 while the total fall in SCH 1 landings was 60 tonnes.

28 The commercial sector has reported difficulties in securing sufficient annual catch entitlement (ACE) to cover all of their school shark catch. Analysis of deemed value payments since 2003 shows that almost all fishers and fishing companies who made substantial deemed value payments for SCH 1 also held substantial amounts of ACE for SCH 1. Therefore, it does not appear that the overcatch is due to people deliberately fishing for SCH 1 without holding ACE. Rather, the overcatch appears to be mainly caught by those who have substantial ACE holdings, but not enough to cover their SCH 1 catch. Any increase in the TACC would increase the amount of ACE available.

29 MFish data[78] suggest that the majority of SCH 1 is taken as a bycatch, though it is also a target species of some importance. These data also suggest that catches of SCH 1 are roughly evenly split between trawl, set-net and bottom long line fisheries and around 30% of the total SCH 1 catch is generally taken on the east coast with around 70% on the west coast.

30 Commercial stakeholders have suggested that the current TACC for SCH 1 is constraining the target SCH 1 fishery as fishers often only have sufficient ACE to cover bycatch. Increasing the TACC may therefore increase target fisheries for school shark using set nets and bottom long-lines.

Stock status and biological characteristics

Status of the SCH 1 stock

31 Recreational and environmental respondents consider that the lack of knowledge about the stock and the vulnerability of school shark to fishing pressure mean that the TACC should not be increased.

32 The SCH 1 TACC was originally set at half the level of the catch taken in 1983. This was because of apparently declining catch rates and concern about the low productivity of the species. However, SCH 1 catches and the TACCs have increased since 1986/87.

33 The 2007 School Shark Plenary[79] reported that there are no indications that current catches are not sustainable in the short-term. However, it is not known whether recent catch levels or the current TACCs are sustainable in the long-term, or if they are at levels that will allow the stocks to move towards a size that will support the MSY.

[77] These data are generated from catch effort reports and will not include all catches of SCH 1 where taken as a bycatch. Therefore, these data are uncertain. However, they are useful for indicative purposes.
[78] These data are generated from catch effort reports (for fishing years 2001/02 to 2005/06) and will not include all catches of SCH 1 where taken as a bycatch. They are therefore uncertain and probably over-estimate the amount of SCH 1 which is taken as a target species. However, they are useful for indicative purposes.
[79] This document summarises the conclusions and recommendations of scientists on the Inshore Working Group relating to school shark fisheries in New Zealand

34 No estimates of current absolute biomass are available for any SCH stock. Estimates of relative abundance are based on CPUE analyses, using catches up to and including the 2001/02 fishing year[80]. CPUE analysis using more recent data is due to become available later in 2007, although too late to inform your decision this year. MFish notes that trends in targeted CPUE time series can be unreliable for school shark populations[81] and that CPUE indices for school shark are characterised by high uncertainty. It has been recommended that because of the mobility of school sharks, New Zealand wide trends in landings or CPUE should take precedence over regional trends[4]. No trends were found that could be interpreted as a change in abundance for the New Zealand stock as a whole.

35 Nevertheless, CPUE analyses have produced indices that are flat or declining around the North Island (including SCH 1) and flat or increasing around the South Island. Although abundance of South Island fish stocks appeared to have increased, there is a view that this pattern may be due to a southward displacement of North Island fish[82].

School shark biology

36 Results of tagging studies suggest that school shark around New Zealand is a single biological stock[83]. The majority of tagged fish have been recaptured in the same QMA in which they were released. However, some have been recaptured after large scale, and even trans-Tasman, movements.

37 School shark is a relatively slow growing, late maturing species with low fecundity. Age at maturity has been estimated at 12-17 years for males and 13-15 years for females. Breeding occurs once every two or three years. These factors suggest that the stock is less productive and hence more susceptible to overfishing than many other fisheries, including most target fisheries of which SCH 1 is a bycatch.

38 A study of the productivity of shark stocks and their ability to recover from fishing pressure found that the "rebound ability" (resilience) of school shark was one of the lowest among shark species and that any recovery of school shark from fishing pressure would be slow. Shark species have a strong relationship between population size and recruitment, meaning that if the population declines, recruitment is likely to become progressively less successful.

39 School shark as a species is particularly vulnerable to over-fishing if the older, larger and more productive females are removed from the stock. Modelling work undertaken on the Australian school shark population indicates that it is important to protect the older, larger female school sharks during their years of greatest productivity.

40 These biological characteristics support setting a cautious TAC that would have a higher probability of ensuring sustainability.

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[80] Ayers, D, Paul, L.J., Sanders, B.M. 2004. Estimation of catch per unit effort analyses for school shark (*Galeorhinus galeus*) from bycatch and target fisheries in New Zealand, 1989-90 to 2001-02. .*New Zealand Fisheries Assessment Report 2006/26.* 121 p.

[81] Bradford, E. (2001). Standardised catch rate indices for New Zealand school shark, *Galeorhinus galeus,* in New Zealand, 1989–90 to 1998–99. *New Zealand Fisheries Assessment Report 2001/33.* 75 p.

[82] Ayers, D, Paul, L.J., Sanders, B.M. 2004. Estimation of catch per unit effort analyses for school shark (*Galeorhinus galeus*) from bycatch and target fisheries in New Zealand, 1989-90 to 2001-02. .*New Zealand Fisheries Assessment Report 2006/26.* 121 p.

[83] Stock boundaries based on the current QMAs, are essentially in place to prevent localised depletion. However, there are no definitive data on which to base changes to the stock boundaries currently used for management purposes.

Adaptive Management Programmes

41 Other school shark stocks in the South Island and the south-west coast of the North Island have had TACC increases of 5% (SCH 5) and 20% (SCH 3, 7 & 8) under AMPs. As school shark around New Zealand is considered to be a single biological stock, any changes to the TACCs of school shark stocks are likely to impact both on abundance within the QMA where the TACC was increased and the wider stock.

42 One environmental respondent argued that, as school shark is considered to be a single biological stock around New Zealand, the impacts of the AMP increases in other stocks on the whole national stock should be assessed before the SCH 1 TACC is changed. MFish considers that all available information on school shark has been assessed by the Inshore Working Group (IWG) and the conclusions of the IWG form part of the basis of this paper.

Other potential impacts of fishing for SCH 1

Maui's dolphin

43 MFish data, which is somewhat uncertain but is the best available, suggest that in the past five fishing years around 40% of the SCH 1 caught has been taken within the probable range of Maui's dolphin. This includes 36% of SCH 1 taken by trawl and 17% of SCH 1 taken by set-net. Commercial stakeholders have reported that the current TACC is constraining commercial target set-netting for SCH 1. The IPP noted that increasing the TACC could result in increased targeting of SCH 1 by set-net, a method considered to be a significant threat to Maui's dolphin and could therefore increase the risk of Maui's dolphin interaction with fishing gear. However, it is entirely possible that any increased fishing effort would occur outside of the range of Maui's dolphin.

44 Commercial respondents did not agree that any increased TACC would impact on Maui's dolphin and thought that any risk of increased interaction with Maui's dolphin would be more appropriately dealt with through the Threat Management Plan. They argue that Maui's dolphin do not currently interact with commercial fishing operations in SCH 1 due to a combination of spatial separation and current regulations.

45 Environmental respondents noted that much of the quota for school shark is caught in set nets, which poses particular problems for non-target bycatch species such as dolphins and called for fishing restrictions within the range of Maui's dolphin.

46 MFish does not consider that the setting of a TAC for this one stock is the best way to deal with fishing-related threats to Maui's dolphin. Options set out in the Threat Management Plan, currently out for consultation, will apply to school shark fisheries as well as to other fisheries in the range of Maui's dolphin. However, in setting the TAC, you should be aware of the risk (which MFish cannot quantify and on which stakeholders have differing views) that fishing for school shark may have an effect on Maui's dolphin.

Assessment of Management Options

Total Allowable Catch

47 MFish proposes to set a TAC for SCH 1 under section 13(2)(a) of the Act. In managing a stock under section 13(2)(a) you must, in setting the TAC, maintain the stock at or above a level that can produce the maximum sustainable yield (MSY)[84], having regard to the interdependence of stocks. However, estimates of current biomass for SCH 1 or any other school shark stocks are unavailable.

48 In the absence of reliable biomass and MSY estimates for SCH 1, MFish proposes to set the TAC based on assessment of past and current catches of each sector and an estimate of other fishing-related mortality. MFish considers that the relatively stable level of commercial catches and the estimates of non-commercial catches constitute the best available information for considering the TAC for SCH 1. However, it should be noted that catches above a TACC do not necessarily indicate increased abundance in the stock. Indeed, a stock can have stable catches even when it is below the biomass level that will produce the MSY.

49 Three options have been proposed for setting the TAC. The first represents existing commercial catch limits plus estimates of non-commercial catches and other fishing-related mortality. The other two options propose TACs that reflect recent and past commercial landings, and provide increased utilisation opportunities in the fishery.

50 As the available information for SCH 1 is uncertain and inadequate, you should be cautious when making your decision. Options 2 and 3 provide a progressively less cautious approach regarding sustainability while providing for greater utilisation.

TAC Options

Option 1 – Current TACC plus allowances

51 Option 1 proposes that the TAC for SCH 1 be set at 866 tonnes. This option provides for the existing TACC of 668.47 tonnes and estimates of current customary and recreational catches and other fishing-related mortality. The current TACC for SCH 1 has been consistently exceeded, with one exception, over the past 10 fishing years.

52 Under this option, no further utilisation opportunity would be provided in the fishery and, if accompanied with increased deemed value for SCH 1, commercial landings may fall.

53 Setting the TAC at 866 tonnes should ensure that any sustainability and environmental risks associated with the fishery are not increased. This option places the greatest weight on the uncertainty of the current information regarding stock status and takes the most cautious approach in favour of sustainability. Considering the uncertainties in the stock information, this option provides the greatest certainty that, over the long term, SCH 1 will be managed at or above B_{MSY}.

[84] The biomass that can produce the MSY is called the B_{MSY}.

Option 2 – Increase in line with average commercial landings in past 5 years

54 Option 2 proposes that the TAC for SCH 1 be set at 893 tonnes, an increase of 27 tonnes above option 1. A TAC of 893 tonnes reflects the average reported commercial landings in the past five years, plus allowances for customary and recreational fishing and other fishing-related mortality.

55 This option places more weight on short-term utilisation than option 1. Although increasing the TAC to reflect the average commercial landings in the past 5 years is not thought likely to pose a sustainability risk in the short-term, the longer term sustainability risks are unknown. A higher TAC increases the risk that the stock will not be maintained at or above B_{MSY}.

56 The benefit of option 2 is that it provides for recent catches of school shark, above the TACC, that are likely to have been taken as a bycatch in trawl fisheries targeted at other finfish stocks.

Option 3 – Increase in line with average commercial landings in past 10 years

57 Option 3 proposes that the TAC for SCH 1 be set at 944 tonnes, an increase of 78 tonnes above option 1. A TAC of 944 tonnes reflects the average reported commercial landings in the past ten years, plus allowances for customary and recreational fishing and other fishing-related mortality.

58 This option places the most weight on providing a short-term utilisation opportunity. Considering the biological characteristics of the species (slow growth, late maturity, low productivity, not predicted to recover quickly from fishing pressure), a TAC that is 78 tonnes higher than option 1 would increase the sustainability risks associated with fishing for the stock. A higher TAC increases the risk that the stock will not be maintained at or above B_{MSY}. These risks are greater for this option than for options 1 and 2.

59 The benefit of this option is that it provides for increased utilisation opportunities in the fishery and removes some constraints on commercial fishing for SCH 1.

TACC and Allowances

60 MFish proposes that you set the SCH 1 TACC under section 20 of the Act and, in doing this, make allowances for Maori non-commercial fishing interests, recreational interests and all other mortality to SCH 1 caused by fishing as required by section 21. In setting the allowances and the TACC, you are required to consider the social, economic and cultural wellbeing of the persons within each sector.

Customary allowance

61 Sharks in general are seen as one of the most important taonga species and anecdotal information suggests that school shark is an important species for Maori. The fishery for mangō (a term that collectively covers a number of shark species including school shark, rig, and spiny dogfish) was traditionally important to many coastal communities who took part in annual fishing expeditions during which large numbers of mangō were caught in coastal bays and sun-dried on trees or wooden frames for storage. However, this fishery has declined in recent decades and customary catches of shark species are reportedly smaller than they used to be.

62 MFish has very little information on the level of customary catch of SCH 1. In recognition of the importance of school shark to Maori, in the IPP MFish proposed to base the customary allowance for SCH 1 at a level starting at 99 tonnes; this is 150% of the recreational catch estimate.

63 No customary respondents have commented on the proposed 99 tonne allowance. One recreational respondent suggested it may be too high. One commercial respondent was disappointed at the lack of progress in estimating customary catch and argued that setting the allowance at 150% of the already uncertain recreational catch estimate was not good enough.

64 MFish agrees that progress needs to be made in estimating customary catch; however there is no other information available to use for setting the SCH 1 customary allowance at this stage. MFish has no information to suggest that 99 tonnes is too high and considers that it is a reasonable customary allowance.

Recreational allowance

65 MFish proposes to set the recreational allowance on the basis of estimates of recreational catches of SCH 1. A survey in 1996 estimated the recreational catch of SCH 1 to be around 46 tonnes per year. A survey in 1999/2000 estimated the recreational catch of SCH 1 to be around 66 tonnes per year. The 1999/2000 survey is believed to be more accurate for school shark. In the IPP, MFish proposed to set the recreational allowance for SCH 1 at a level starting at 66 tonnes.

66 School shark is of importance to recreational fishers – of 123 species included in the 1999/2000 recreational catch survey, school shark had the 45^{th} highest catch estimate (by weight of catch).

67 Recreational respondents have submitted that the 66 tonne allowance seems adequate. They also advised that recreational fishers do value school shark as a valuable food source and also as a game fish, noting that they are targeted in competitions and are the largest fish that many junior anglers have caught.

Allowance for other fishing-related mortality

68 Other fishing-related mortality is an estimate of the amount of the stock killed by but not caught during a fishing operation (for example, where a fish escapes from a fishing net but dies due to its encounter with the fishing gear). For all options in the IPP, MFish proposed an allowance for other fishing-related mortality of 5% of the TACC. This approach is consistent with allowances for other New Zealand school shark stocks. No views were expressed by stakeholders on the proposals for setting the allowance for other fishing-related mortality.

TACC

69 In Table 2 below, MFish has illustrated the potential economic impact of the TACC options by considering the export and domestic economic value of school shark[85]. The approach used to develop this illustration involves inherent uncertainties and you should be aware that the port price may not represent the actual wharf-side value of the fish. However, MFish considers this coarse analysis illustrates the potential gains to industry in the short term under the management options proposed.

Table 2: Value, by export price and port price, of each TACC option

Option	TACC	Export value[86]	Domestic value[87]	Total value	Increase in value from current TACC
Option 1. TAC set at current limits	668.47	$726,841	$1,037,659	$1,764,500	$0
Option 2. TAC increase of 25 tonnes	689	$749,163	$1,069,528	$1,818,691	$54,191
	693	$753,513	$1,075,737	$1,829,250	$64,750
Option 3. TAC increase of 74 tonnes	728	$791,569	$1,130,067	$1,921,636	$157,136
	742	$806,791	$1,151,799	$1,958,591	$194,091

70 Deemed value payments have cost the commercial sector an average $101,000 in the past five fishing years. An increased TACC should reduce the cost to the sector of paying deemed values.

71 A TACC increase may have "downstream" impacts on related industries such as processing and transport services. It could also improve the financial situation for coastal communities that are dependent on the inshore fishing industry. However, if the TACC is set at the level of current catches, then the downstream benefits may not be significant.

72 MFish notes that no commercial respondent to the consultation commented on this analysis or suggested alternative figures.

Proportional vs. non-proportional approach

73 Proportionally allocating any increase in the TAC above the level envisaged in option 1 would, notionally, share the benefit of the increased catch level between all three sectors. However, this would provide for non-commercial allowances that are above the estimate of

[85] To determine how much SCH 1 is exported, MFish calculated that approximately 12.3% of all school shark TACCs in New Zealand was exported in the 2005/06 fishing year and therefore assumed that 12.3% of SCH 1 was exported with the remainder being sold domestically. MFish has assumed that this proportion will remain unchanged if the TACC is increased. For each option, MFish then calculated the value of the proportion of the stock which is exported (12.3%) against the export price and the value of the proportion of the stock which is sold domestically (87.7%) against the port price to get an overall value for the stock.
[86] Export value is $8.04/kg based export price of school shark for year ending December 2006.
[87] Domestic value is $1.77 based on the port price of school shark in the 2005/06 fishing year.

current non-commercial catches. It is unlikely that any such additional allocation would be fully utilised and thus best value may not be realised through proportional allocation.

74 Some commercial respondents argued that all TAC adjustments should be allocated proportionally. Another commercial respondent did not consider that there was any justification for increasing non-commercial allowances above the levels of estimated non-commercial catch. One customary respondent supported proportional increases.

75 MFish understands the position of those who support proportional changes to a TAC. However, as noted in the IPP, MFish considers that it may be appropriate in this case to allocate any increase in the SCH 1 TAC above the level envisaged in option 1, entirely to the TACC for the following reasons:

a) The TAC is being set for the first time; there are no existing customary or recreational allowances to increase.

b) The estimates of current recreational and customary catch are considered to provide in full for the catches of those sectors and so an increase to recreational and customary allowances may have no effect on those fisheries, particularly as the increases to the allowances would be relatively small.

c) The TACs proposed in options 2 and 3 are based on recent commercial catches, plus estimates of current non-commercial catches.

TACC and Allowances Options

76 The options are outlined in Table 3 below.

Table 3: SCH 1 management options (tonnes)

Option	Allowance Approach	TAC	Recreational Allowance	Customary Allowance	Other fishing related mortality	TACC
Option 1. TAC set at current limits	Not applicable	866	66	99	33	668.47
Option 2. TAC increase of 25 tonnes	Proportional	893	68	102	34	689
	Non-proportional	893	66	99	35	693
Option 3. TAC increase of 74 tonnes	Proportional	944	72	108	36	728
	Non-proportional	944	66	99	37	742

Other Management Controls

Deemed values

77 In setting a TAC, and potentially a new TACC, it is appropriate for you to consider revising the deemed value level for school shark to help ensure that commercial catches do not exceed the level of the TACC in future. Deemed values for a number of stocks, including

SCH 1, are being reviewed in the *Review of the Deemed Value Rates for the October 2007 Sustainability Round* section of this document.

Schedule 6 listing – protection of larger females

78 The results of Australian modelling work suggest that removing the larger females from the population could be a significant risk to the sustainability of the stock.

79 Recreational respondents have suggested that school shark be added to Schedule 6 of the Act so that large female school shark can be returned to the sea if they are likely to survive.

80 Schedule 6 provisions are best for fish that are typically alive when caught. MFish has little information on the life status of school shark when caught by the main fishing methods; set-net or trawl. In the case of set-net, it is expected that much of the fish is dead when bought to the boat. MFish consider that there is insufficient information for an accurate determination as to whether adding SCH 1 to Schedule 6 is a useful management tool. However, MFish will consider if further measures are necessary to protect pupping school shark in the Kaipara Harbour.

Compliance

81 ACE for SCH 1 is often in short supply and can be unavailable to cover bycatch. Key compliance concerns in a fishery with this type of problem relate to misreporting (of weights, area and species) and dumping. In part, MFish relies on the incentives that quota provides for commercial fishers to fish the stock in a sustainable manner. More proactively, MFish will rely on monitoring and at sea surveillance to detect dumping. If the TACC is increased, the availability of ACE should improve, helping to lessen these problems. If the TACC is unchanged and deemed values are raised, the compliance problems may increase.

East-west coast stock split

82 Recreational respondents argued that the present QMA for SCH 1 is too large and unmanageable and, given that the inshore fisheries plans and the new CPUE analysis will be split between the east coast and west coast of the North Island, SCH 1 should be split into east and west coast stocks.

83 MFish does not agree that the stock should be split between the east and west coast of the northern North Island. School shark around New Zealand is considered to be a single biological stock with the current QMAs in place essentially to prevent localised depletion. MFish is not aware of any localised depletion issues that would justify splitting the east and west coast of the northern North Island into separate school shark stocks, particularly given the costs involved with such an activity.

Other Management Issues

Link to new management processes

84 A recreational respondent queried where the SCH 1 proposal fitted within the processes of objective-based fisheries management, fisheries plans and fisheries standards. They also called for MFish to clearly articulate the management objective for the fishery, how this is

supported by the best available information, which fisheries standards will be met and why a better outcome could not be achieved as part of a fisheries plan process.

85 MFish notes that the fisheries plan process is only just beginning. SCH 1 is included in the West Coast North Island Finfish Plan, which will be one of the first to be developed. MFish considers that it would be best for management objectives for the fishery to be developed, and standards to be implemented, in conjunction with stakeholders through the fisheries plan process. MFish also notes that ultimately you are required to provide for the sustainable utilisation of the SCH 1 fishery and the options presented in this paper seek to achieve that goal.

Research

86 Some environmental and customary respondents called for further research to be conducted into school sharks to determine accurate stock information.

87 MFish notes that results from a CPUE analysis of school shark stocks is due to be completed later in 2007. A stock monitoring assessment and a study of school shark stock relationships around New Zealand have been scheduled in the Medium Term Research Plan for inshore stocks. Other research projects will be developed as required.

National Plan of Action for Sharks

88 Environmental respondents were concerned about the management of shark fisheries and proposals to increase shark TACCs without an overall National Plan of Action (NPOA) for Sharks and called for MFish to urgently develop a NPOA for sharks.

89 MFish is in the process of developing a NPOA for sharks. This is due to be released for consultation soon.

Hauraki Gulf Marine Park Act 2000

90 In setting a TAC for SCH 1, you are required to consider the social, economic, recreational and cultural wellbeing of people in the Hauraki Gulf and, in particular, to maintain and enhance the physical resources of the Gulf, including school shark.

91 Relatively little school shark is caught commercially in the inner Hauraki Gulf (Fisheries Statistical Areas 005, 006 and 007). School shark is caught in larger quantities in Statistical Areas 003 and 008 but the Hauraki Gulf Marine Park only covers a relatively small part of these Areas. The Marine Park also covers a small amount of Areas 004 and 009 but relatively little school shark is caught in these Areas (see map in Appendix 2). It is therefore not apparent that the Hauraki Gulf Marine Park Area is of significant importance for the wellbeing of commercial fishers of school shark or for the wellbeing of those living in the Gulf who purchase commercially caught school shark.

92 MFish has no information to suggest that school shark in the Hauraki Gulf is more or less important to non-commercial fishers than school shark elsewhere. Traditionally Maori are known to have fished for shark species in the Firth of Thames and may have done so in other areas of the Gulf.

93 No respondents to this consultation to provided any additional information on the importance of school shark to the social, economic, recreational and cultural wellbeing of people in the Hauraki Gulf.

Statutory considerations

94 Statutory considerations are summarised in Appendix One.

Appendix One

Statutory Considerations

95 In developing the management options outlined in this paper, MFish has considered all of the relevant statutory obligations set out in the Fisheries Act 1996. These are summarised below:

a) **Section 5(a) and 5(b):** *Application of International Obligations and Treaty of Waitangi (Fisheries Claims) Settlement Act 1992:* There is a wide range of international obligations relating to fishing including sustainability and utilisation of fishstocks and maintaining biodiversity. MFish considers issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options for SCH 1.

b) **Section 8:** *Purpose of the Act:* The management options provide for utilisation by setting allowances for commercial, recreational and customary fishers. TAC options 2 and 3 should have economic benefits for commercial fishers and TAC option 1 does not reduce the amount of SCH 1 allocated to the commercial sector. Any increase of the TAC, to above the level of option 1, could increase the risk to stock sustainability as school shark have low productivity. However, recent catches have been relatively stable and may indicate that those risks are small, at least in the short term.

c) **Section 9(a):** *Associated or dependent species:* Maui's dolphin occur within the range of school shark. Increasing the SCH 1 TACC could increase the risk of Maui's dolphin interaction with fishing gear; however this is not certain and the risk cannot be quantified.

d) **Section 9(b):** *Biological diversity:* There is no evidence that interactions between school shark and other species are of significant magnitude to impact on biological diversity.

e) **Section 9(c):** *Habitat of particular significance for fisheries management:* One school shark habitat of particular significance for fisheries management has been identified. The Kaipara Harbour is a location where female school shark congregate to pup and where the catch can be made up entirely of pregnant females. It is unknown whether the options presented would increase fishing pressure on the Kaipara Harbour school shark.

f) **Section 10:** *Information Principles:* The information principles of the Act require that decisions be based on the best available information, taking into account any uncertainty in that information, and applying caution when information is uncertain, unreliable, or inadequate. Section 10 also requires that you take into account the principle that the absence or uncertainty of information should not be used as a reason to postpone, or fail to take, any measure to achieve the purpose of the Act. MFish considers that the information used to support the SCH 1 proposals is uncertain and inadequate but is the best currently available. MFish also recognises that SCH 1 is an information poor fishery and that the options proposed meet the requirement of this section. In preparing this paper, MFish relied primarily on the following information sources to develop the management options:

   i) The Report from the Stock Assessment Plenary on School Shark, May 2006

   ii) Commercial catch and landings data held by the Ministry of Fisheries

iii) Ayres et al. Examination of catch per unit effort analyses for school shark from bycatch and target fisheries in New Zealand, 1989-90 to 2001-02 (*Fisheries Assessment Report 2006/26*)

iv) Responses to the consultation on the Initial Position Paper.

g) **Section 11(1)(a):** *Effects of fishing on any stock and the aquatic environment:* A significant amount of SCH 1 is caught by bottom trawl, which does impact on the benthic environment. However, SCH 1 is only taken by bottom trawl as a bycatch and the bottom trawl operations do not generally target school shark. As a result, MFish does not consider that fishing for school shark has a significant impact on biological diversity of the aquatic environment.

h) **Section 11(1)(b):** *Existing controls under the Act:* For SCH 1 there is a current TACC of 668.47 tonnes. Under the Fisheries (Auckland and Kermadec Areas Amateur Fishing) Regulations 1986, school shark is included in the combined daily bag limit of 20 and has a minimum set net mesh size of 125mm.

i) **Section 11(1)(c):** *Natural variability of the stock:* Although no estimate of school shark biomass is available, it is assumed to fluctuate over time due to variable recruitment caused primarily by environmental conditions. This variability is likely to be less important than in other stocks. Indeed, variability of shark species is generally lower than for bony finfish with pelagic eggs and larvae.

j) **Section 11(2)(a) and (b):** *Resource Management Act 1991 and Conservation Act 1987:* There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for this stock.

k) **Section 11(2)(c):** *Hauraki Gulf Marine Park Act 2000:* The implications of sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 were considered in the main section of this paper.

l) **Section 11(2A)(a) and (c):** *Conservation and fisheries services:* A Threat Management Plan to mitigate the risk to Maui's dolphin is being developed. The potential impact of any SCH 1 TAC increase on Maui's dolphin has been discussed in this paper. Standard fisheries services such as research and enforcement of the fisheries regulations are ongoing. No decision has been made not to require conservation or fisheries services.

m) **Section 11(2A)(b):** *Relevant fisheries plans:* While fisheries plans that include school shark are in development, no relevant fisheries plans have been approved under section 11A(1).

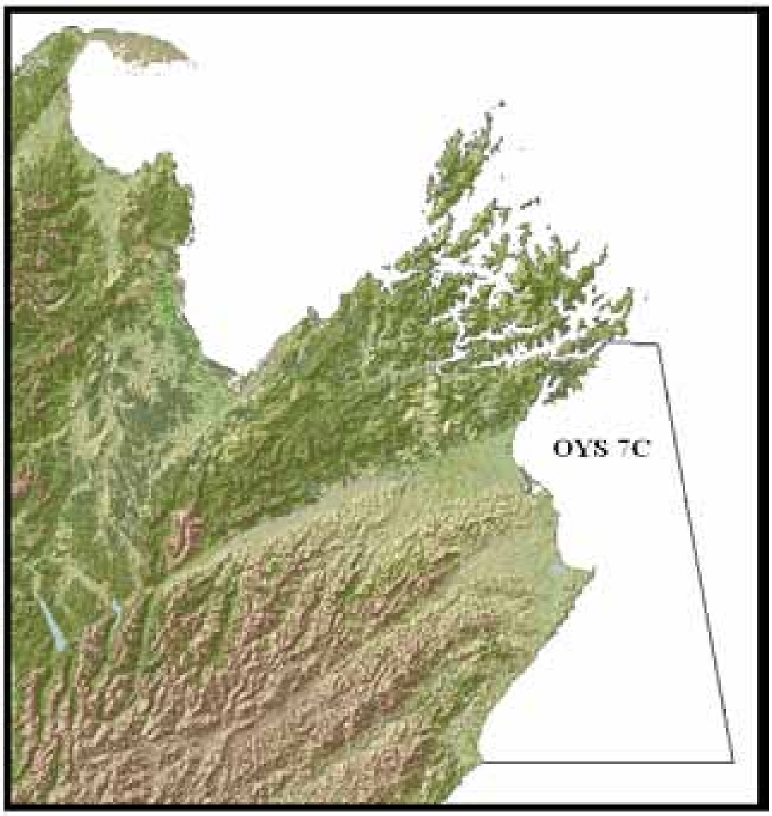
n) **Section 13(2)(a):** *Total Allowable Catch:* The TAC under section 13(2) should be set at a level that maintains the stock at or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks. As biomass information is unavailable, it is unknown whether the current TACC, current catch levels, or the options presented in this paper, are at levels that will support the maximum sustainable yield. However, recent catches have been relatively stable and there are no indications that current catches are not sustainable in the short-term.

o) **Section 20 (5):** *No TACC unless TAC set:* The original TACC for SCH1 was set under section 28C of the Fisheries Act 1983 which did not require a TAC to be set first. Under the 1996 Act any setting of a TACC requires the TAC to be set first.

p) **Section 21(1):** *Non-commercial fishing interests and other mortality caused by fishing:* The nature of the fishery and the interests of the respective fishing sectors have been considered in proposing TACCs and allowances for recreational and customary interests and all other mortality to the stock caused by fishing.

q) **Section 21(4) and (5):** *Mataitai reserves and closures under sections 186A and 311 of the Act:* There is one Mataitai reserve in the QMA – at Raukokore on the eastern Bay of Plenty, however it is not considered that this has any significant implications for the SCH 1 TAC. There are three areas closed for customary purposes in the QMA, all of these are closures are for certain shellfish species only and have no implications for the SCH 1 TAC. No section 311 closures have been enacted in the QMA.

DREDGE OYSTER (OYS 7C) – FINAL ADVICE



Executive Summary

1 This advice paper seeks your decision on whether to increase the Total Allowable Catch (TAC) for the dredge oyster (OYS 7C) fishery (Clarence Point to West Head).

2 An Initial Position Paper (IPP), released in June 2007, proposed four options: retain the current TAC at five tonnes (*status quo*) or increase the TAC to either 25 tonnes, 50 tonnes, or 100 tonnes. Under each option, the current non-commercial allowances of three tonnes are retained and the proposed Total Allowable Commercial Catch (TACC) is the remainder of the TAC.

3 Each option has an associated degree of risk of ensuring the long-term sustainability of the OYS 7C stock and managing the effects of fishing on the benthic environment. This risk increases under higher TAC levels.

4 Six submissions were received on the IPP. Two submissions from industry support the highest TAC option to enable commercial fishers to derive greater economic value from the OYS 7C stock (both submissions support a higher TAC level than the options presented). Two submissions support a moderate TAC increase to provide greater utilisation opportunities in light of the available dredge oyster biomass. Two submissions support retaining the existing TAC because of concerns about the impacts of fishing under higher catch levels on the wider aquatic environment.

5 This paper considers the views raised by submitters in response to the proposed TAC options. Based on the best available information, the Ministry of Fisheries (MFish) supports increasing the OYS 7C TAC to provide a higher commercial harvest level. In setting the TAC, you are required to balance the available opportunity for industry to derive greater economic return from the fishery against ensuring a sustainable fishery and taking into account the effects of fishing on the aquatic environment.

The Issue

6 The Minister of Fisheries set a nominal TAC of five tonnes (greenweight) for the OYS 7C stock when dredge oyster was introduced into the Quota Management System (QMS) on 1 October 2005. The TAC was set at a conservative level to reflect the absence of relevant stock assessment information with which to determine a more appropriate sustainable harvest level. The TAC includes allowances of one tonne each for customary and recreational interests, and other sources of fishing-related mortality, and a TACC of two tonnes.

7 Following QMS introduction, there has been negligible commercial catches within the OYS 7C fishery (ie, less than 100 kg). This lack of commercial fishing effort is directly attributable to the small TACC and the associated fishing costs involved to harvest dredge oysters. These fishing costs include vessel time, fuel, crew wages, etc, as well as the cost to obtain the necessary sanitary and biotoxin certification[88] for waters where dredge oysters are taken. The existing TAC effectively prohibits industry from developing a viable commercial fishery, since the fishing costs to harvest two tonnes of dredge oysters outweigh any economic returns.

8 Industry has requested a review of the TAC to enable commercial fishers to derive a greater economic return from the fishery. Industry has supported its request by collecting new stock assessment information that indicates the fishery can sustain higher catch levels.

[88] The taking of bivalve molluscs (including dredge oysters) for human consumption must be taken from approved waters certified under the Animal Products (Specifications for Bivalve Molluscan Shellfish) Notice 2006.

Summary of Options

Initial Proposal

9 The IPP proposed the following four TAC options:

Table 1: Four TAC options for OYS 7C (tonnes greenweight) as proposed in the IPP

	Option 1 (*Status quo*)	Option 2	Option 3	Option 4
TAC	5 tonnes	25 tonnes	50 tonnes	100 tonnes
Allowance for other sources of fishing-related mortality	1 tonne	1 tonne	1 tonne	1 tonne
Allowance for customary Mäori interests	1 tonne	1 tonne	1 tonne	1 tonne
Allowance for recreational interests	1 tonne	1 tonne	1 tonne	1 tonne
TACC	2 tonnes	22 tonnes	47 tonnes	97 tonnes

Final Proposal

10 The options available for consideration are:

a) **AGREE** to:

Option 1 (*status quo*): Leave the OYS 7C TAC and TACC unchanged at 5 tonnes and 2 tonnes, respectively.

OR

b) **AGREE** to:

Option 2: Increase the OYS 7C TAC and TACC from 5 tonnes and 2 tonnes to 25 tonnes and 20.5 tonnes, respectively;

OR

c) **AGREE** to:

Option 3: Increase the OYS 7C TAC and TACC from 5 tonnes and 2 tonnes to 50 tonnes and 43 tonnes, respectively (MFish's preferred option)

OR

d) **AGREE** to:

Option 4: Increase the OYS 7C TAC and TACC from 5 tonnes and 2 tonnes to 100 tonnes and 88 tonnes, respectively.

11 Note the proposed final options are different to those presented in the IPP as they include new allowances for other sources of fishing-related mortality. Under each option the current allowances of one tonne each for customary Māori and recreational interests are retained.

12 As Minister of Fisheries, you may consider alternative options that you consider best address your obligations under the Fisheries Act 1996.

Consultation

13 Your decision on whether to increase the TAC for the OYS 7C fishery is a decision under s 13(1) of the Fisheries Act 1996; therefore, the consultation requirements of s 12 apply. Further, in respect of your decision on whether to adjust the TACC for the OYS C fishery, the consultation requirements set out in s 21(2) apply.

14 Consultation on the IPP was undertaken with such persons or organisations representative of those classes of persons having an interest in the OYS 7C stock or the effects of fishing on the aquatic environment in the area concerned, including Māori, environmental, commercial, and recreational interests.

Submissions Received

15 Submissions regarding this proposal were received from:

- Environment and Conservation Organisation of NZ Inc. (**ECO**)
- Fisheries Development Solutions (**FDS**)
- Marlborough Recreational Fishers Incorporated (**MRF**)
- Matthew Hardyment
- New Zealand Recreational Fishing Council (**NZRFC**)
- The New Zealand Seafood Industry Council Ltd (**SeaFIC**)

Rationale for Management Options

16 The IPP presented four TAC options based on stock assessment information that has recently become available. This information (collected in April and May 2007 in support of industry's request for a TAC review) is based on dredge oyster beds within Cloudy and Clifford Bays where commercial densities of oysters are known to occur. The information suggests that recruited[89] dredge oyster biomass within the survey area is 1 778 tonnes (greenweight) comprising 19.5 million oysters. About 90% of estimated oyster biomass is found within the southern half of the survey area.

89 Regulation 32(2) of the Fisheries (Commercial Fishing) Regulations 2001 imposes a minimum legal size limit for dredge oysters of 58 mm (ie, unable to pass through a ring of 58 mm inside diameter). The recruited fishery comprises oysters greater than 58 mm as these are able to be legally harvested by fishers.

17 Based on the 2007 stock assessment information, four *maximum constant yield* (MCY) estimates[90] were presented in the IPP to provide a range of sustainable yield estimates to assist in determining an appropriate TAC for the OYS 7C stock. These estimates are shown in Table 2.

Table 2: Range of MCY-based yield estimates using a range of estimated values for dredge efficiency and natural mortality

MCY formula	MCY (tonnes)
MCY_1 = 0.25*0.042*(recruited biomass/1)	18
MCY_2 = 0.25*0.042*(recruited biomass/0.64)	28
MCY_3 = 0.25*0.3*(recruited biomass/1)	133
MCY_4 = 0.25*0.3*(recruited biomass/0.64)	213

18 The Shellfish Stock Assessment Working Group considered the above four MCY estimates provided a "plausible range" of sustainable harvest yields for the OYS 7C fishery. Each estimate is derived using two input parameters (proxies) to represent (i) natural mortality (*M*) of the stock, and (ii) dredge efficiency. The Working Group's view acknowledges the inherent uncertainty associated with each estimate as neither of these two parameters are specific to the OYS 7C stock. Instead, they are derived from previous studies undertaken in the Foveaux Strait and Tasman Bay dredge oyster fisheries, and it is not known whether these parameters reliably represent the OYS 7C stock. The Working Group agreed the lowest yield estimate (18 tonnes) is almost certain to be sustainable (apart from any issues related to the impacts of fishing on the benthic habitat). However, without better information on the applicability of the MCY parameters used to represent the OYS 7C stock, it is increasingly difficult to be assured of sustainability under higher catch levels.

19 Two additional MCY estimates are also available for the OYS 7C fishery (409 tonnes and 639 tonnes). However, the IPP did not consider these estimates given the above views of the Working Group.

20 In addition to ensuring the sustainability of the OYS 7C stock, the TAC options presented in the IPP reflect the uncertainty about the impacts of fishing on the aquatic environment under a higher catch level. Dredging for oysters will have an impact on the soft, muddy benthic environment within Cloudy and Clifford Bays, and will affect both the dredge oyster beds and other species found in association with these beds. The impacts can include increased suspension of silt over oyster beds and the direct removal and/or disturbance of various species.

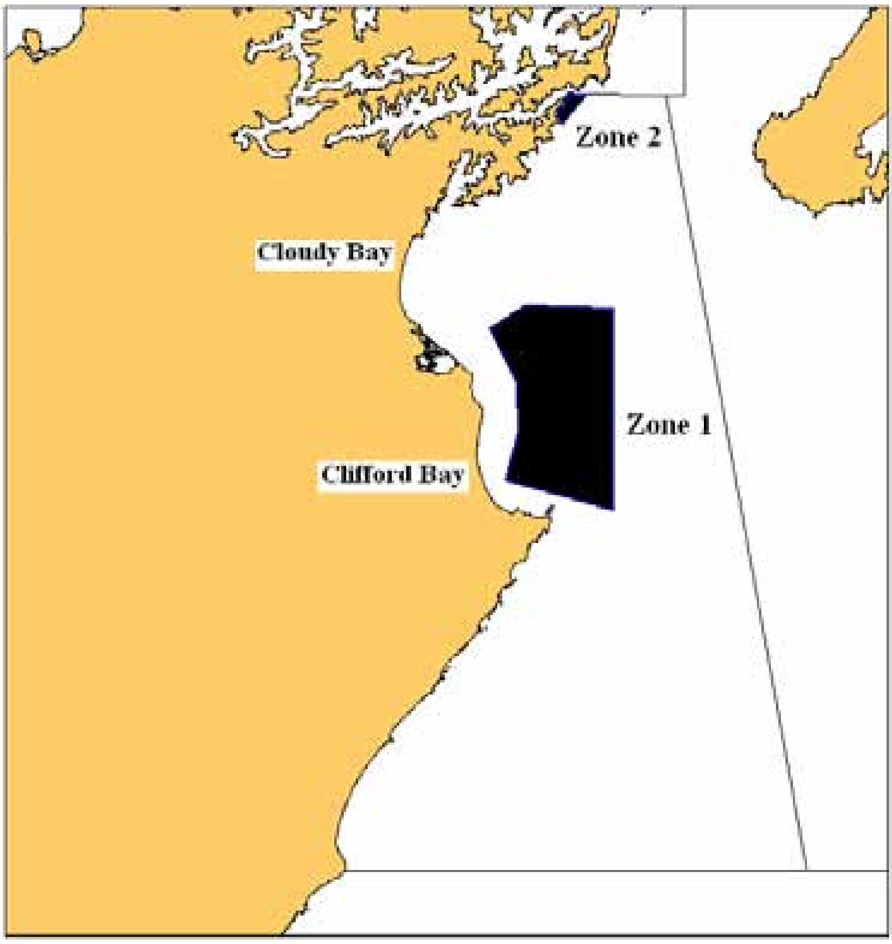
21 The impacts of fishing on the benthic environment will increase with higher harvest levels. However, there is insufficient information to quantify the degree of impact under each TAC

90 MCY = $0.25M\ B_0$. B_0 is an estimate of virgin recruited biomass (assumed to equal the recruited biomass estimated from the survey, divided by dredge efficiency) and M is an estimate of natural mortality.

option. Various areas within the fishery (mainly coastal and around rocky reefs/clumps ie, foul ground) are understood to support a range of sensitive invertebrate species including soft corals, large erect and divaricating bryozoans, starfish, horse mussels, and crabs. While the fishery has been subject to very little commercial dredging to date, the bottom type where dredge oyster beds occur is likely to be already modified by long-term commercial bottom trawling.

22 During the initial stage of developing the OYS 7C fishery, industry proposes to voluntarily restrict fishing to two discrete areas (shown in Figure 2) within the quota management area (QMA) to mitigate the effects of fishing. These areas are where oyster densities are highest and are generally away from coastal areas (ie, >10m water depth exclusions for sanitary purposes) and areas of foul ground. MFish understands the industry will require participating commercial vessels to implement vessel monitoring technology to ensure that fishers adhere to the restricted fishing areas.

Figure 2: Proposed commercial harvest areas (depicted as Zones 1 and 2)



23 One reason for introducing the OYS 7C stock into the QMS (and setting a nominal TAC) is to provide incentives for commercial rights-holders to invest and develop a viable sustainable fishery while taking into account the effects of fishing on the aquatic environment. The TAC options presented in the IPP will enable these rights-holders to achieve this desired outcome.

Assessment of Management Options

Total Allowable Catch

24 The OYS 7C TAC was initially set at a nominal level (five tonnes) to reflect the absence of relevant stock assessment information with which to determine a more appropriate sustainable harvest level at the time of QMS introduction. This approach also acknowledges that the fishery had been subject to negligible commercial fishing effort and the biological characteristics of dredge oysters. Relative to other shellfish fisheries, dredge oysters are a species of low productivity[91] and discrete oyster beds are prone to fluctuations in abundance that can render them susceptible to the effects of localised fishing.

25 The IPP sets out the obligations under the Act to ensure the sustainable utilisation of the OYS 7C fishery. The TAC in this fishery is currently set under s 13 of the Act and the best available information suggests the stock is probably well above a level that can produce the maximum sustainable yield (B_{MSY}). Section 13(2)(a) requires the TAC to be set at a level that maintains the stock at, or above, this target stock level having regard to the interdependence of stocks. In the IPP, MFish proposed four TAC options, each with a different likelihood of achieving this prescribed outcome. MFish highlights that you are not bound to accept any of the four options presented in this paper, but rather you have discretion to consider an alternative option that you consider best addresses your obligations under the Act.

26 Four of the six submissions support the need to increase the TAC to provide commercial fishers with an opportunity to derive greater economic value from the fishery. These submitters agree the current TAC is conservative and overly restricts commercial fishers from deriving greater value from the fishery through higher catch levels. However, MFish notes there is no consensus from submitters on a preferred TAC option. Two submissions support retaining the TAC because of concerns about the impacts of fishing on the wider aquatic environment.

27 MFish disagrees with industry's comments that the proposed options represent a "*one-off*" or *"set and forget"* process in respect to the setting of the TAC. To the contrary, MFish believes effective management of newly developing fisheries, such as the OYS 7C fishery, requires ongoing development and refinement of management measures to ensure all fishers are able to derive better value from the fishery while managing the effects of fishing. This approach may include initiatives for further research and information collection to review sustainable harvest yields and this could lead to periodic adjustments to the TAC to reflect best available information. Other initiatives could include research to investigate the effects of fishing on the aquatic environment under higher catch levels. MFish believes the fisheries plan approach will provide the best framework to manage the OYS 7C fishery in the long-term. Fisheries plans can consider different harvest strategies, and will involve ongoing participation by all relevant stakeholders. MFish notes the proposed Challenger Scallop and Oyster Fisheries Plan will include the OYS 7C fishery and is expected to be completed within the next 2-5 years.

28 There is a wide range of yield estimates (based on a MCY-based harvest strategy approach) to provide a guide in setting an appropriate TAC in accordance with s 13(2)(a) of the Act

[91] Dredge oysters are generally long-lived, slow-growing, brood relatively few larvae that do not disperse widely, and have high post-settlement mortality and low recruit mortality.

(ie, ensuring the stock is at, or above, the target stock level (B_{MSY})). MFish highlights there is inherent risk (arising from uncertainty) that these estimates do not reliably reflect a sustainable harvest level under each of the three higher TAC options. The uncertainty arises in several areas in the calculation of each yield estimate including sampling error (the survey CV is about 20%) and the applicability of the range of parameters (proxies) derived from other dredge oyster fisheries to reliably model the OYS 7C fishery. The main areas of uncertainty include as follows:

- It is unknown whether the estimates of natural mortality (derived from Foveaux Strait and Tasman Bay dredge oyster fisheries) are appropriate for the OYS 7C fishery and reflect the natural variability in oyster populations from year to year;

- There may be problems in using a simplistic MCY-based approach where there may be significant spatial variations in the distribution of oysters and the subsequent concentration of fishing effort;

- Whether natural mortality (*M*) can be reliably used to provide MCY-based yield estimates given the likelihood that there will be some level of incidental fishing mortality, especially under higher catch levels. In the presence of incidental mortality, *M* is likely to be an optimistic proxy for F_{ref} in the yield equation used for the OYS 7C fishery ($MCY = 0.25 \times F_{ref} \times B_0$);

- Inherent variability with non-OYS 7C fishery dredge efficiency estimates (derived from Tasman Bay and an intentionally conservative value);

- There is considerable uncertainty whether current biomass is a good estimate of 'virgin biomass', which is critical in estimating yield for this relatively unexploited fishery.

29 As such, there is the potential for the use of non-OYS 7C parameters to lead to poor estimates of sustainable harvest yields for the OYS 7C fishery. Therefore, MFish supports adopting a cautious approach at this time in setting a new TAC for the OYS 7C fishery until better information becomes available to reassess the applicability of the available yield estimates. Such an adaptive approach is appropriate in developing 'new fisheries' from a relatively unexploited state.

30 MFish disagrees with industry's view that the proposed TAC options are unnecessarily constrained towards the lower range of the available yield estimates. While two additional (higher) estimates have been calculated for the fishery (409 tonnes and 639 tonnes), MFish remains of the view that there is unreasonable uncertainty in using these estimates as a basis to review the TAC at this time for the reasons described above. MFish is not confident that setting the TAC based on these two yield estimates would ensure the long-term sustainability of the OYS 7C stock and manage the effects of fishing on the benthic environment.

31 MFish remains of the view that the four TAC options provide an appropriate management approach to review the OYS 7C TAC. MFish notes that it may be appropriate to reconsider the TAC at a later date once the fishery has responded under a higher catch level to better assess whether the TAC is set an appropriate level. Again, MFish contends the fisheries plan approach will provide the best context in which to review the TAC for the fishery.

32 Under each TAC option proposed, you are required to have regard to the interdependence of stocks.

33 The advantages and disadvantages of the proposed TAC options are discussed below.

Retain the TAC at 5 tonnes (Option 1)

34 This option retains the TAC at five tonnes (*status quo*). Both ECO and MRF express strong support for this option primarily because of the potential impacts of fishing under a higher catch level on both the benthic environment and the associated species. These matters are discussed in a separate section below. Under this option, commercial fishing effort is likely to remain very low, and therefore, the direct impacts of dredging on the aquatic environment will continue to be negligible.

35 MFish does not recommend Option 1 in light of the new stock assessment information, which clearly indicates the fishery can sustain higher catch levels than the current TAC allows. Retaining the TAC will continue to prevent industry from deriving best economic value from the fishery, as fishing costs to harvest the TACC will outweigh the economic returns derived from harvesting a maximum of two tonnes of dredge oysters. MFish reiterates that one of the premises of managing fisheries under the QMS is to provide a framework that enables commercial rights-holders to develop fisheries within a sustainable harvest level while managing the effects of fishing. The current TAC was set at a nominal level to allocate commercial development rights to the fishery while acknowledging the absence of stock assessment information. A decision to retain the TAC when new stock assessment information is available is contrary to the intent of introducing the OYS 7C stock into the QMS to provide for the utilisation of the stock while ensuring sustainability.

Higher TAC options (Options 2, 3 and 4)

36 Under these options, the TAC will be increased to either 25 tonnes, 50 tonnes or 100 tonnes.

<u>Ensuring sustainability of the OYS 7C stock</u>

37 As noted above, there is a wide range of harvest yield estimates to provide a guide in setting a higher TAC. However, these estimates are associated with inherent risk that they do not reliably reflect a sustainable harvest level; this risk increases with increasing harvest levels. In addition, because dredge oysters are susceptible to localised depletion, the impacts of fishing on individual oyster beds and on adjacent beds are unknown. As such, the risk of ensuring sustainability of the OYS 7C stock increases under higher TAC options.

38 Although Matthew Hardyment does not express support for a specific TAC option, his views indicate support for a moderate TAC increase. MFish is unclear whether the submitter favours increasing the TAC to 25 tonnes or 50 tonnes, but he notes the fishery is extremely underfished and this is preventing oysters growing to a more desirable size. Typically, unexploited shellfish fisheries exhibit very high biomass, resulting in lower growth rates due to competition between individuals for food and space. MFish agrees that enabling greater catches from the fishery should effectively 'thin out' the oyster beds and this may increase the productivity from the fishery.

39 The NZRFC supports Option 3 (increasing the TAC to 50 tonnes) on the basis that new information is available to justify a higher catch level. MFish agrees with NZRFC's view that industry is adopting a "more cautious and research-driven approach" to develop the OYS 7C fishery, and that this TAC would provide sufficient encouragement for industry to develop the fishery while ensuring sustainability is maintained.

40 MFish contends that Option 2 (increasing the TAC to 25 tonnes) provides the lowest degree of risk (of the three higher TAC options) of ensuring the OYS 7C stock is maintained at, or above, a level that can produce the $B_{MSY,}$ while having regard to the interdependence of stocks.

41 Increasing the TAC to 50 tonnes (Option 3) accepts a higher degree of risk to the sustainability of the OYS 7C stock. MFish notes the level of uncertainty of maintaining the stock at, or above, a level that can produce the B_{MSY} is higher under Option 3.

42 Industry supports Option 4 (increasing the TAC to 100 tonnes). Industry contends this is conservative and will not threaten the sustainability of the OYS 7C fishery as the minimum legal size limit (58 mm) protects the spawning stock from the effects of fishing, together with proposed voluntary closures and remoteness of the fishery. SeaFIC supports this view, but believes the fishery can sustain a much higher TAC level.

43 MFish accepts the new stock assessment information indicates there is a substantial dredge oyster biomass within the OYS 7C QMA. While the available yield estimates suggest a 100 tonne TAC may be sustainable, MFish highlights the inherent risks associated with these estimates to reliably reflect the OYS 7C fishery (as discussed earlier). The level of risk of maintaining the stock at, or above, a level that can produce the B_{MSY} is highest under Option 4.

44 MFish supports a cautious approach in setting a new TAC for the OYS 7C fishery. It may be more appropriate to obtain better information on the fishery before the TAC is set at a level as high as that proposed under Option 4. This information could also include how the OYS 7C stock responds under a higher catch level. Such an approach acknowledges the susceptibility of a sedentary species such as dredge oysters to localised depletion, and the unpredictable dynamics of a relatively unexploited fishery.

45 MFish notes there is potential for increased conflict between the industry and non-commercial fishers in accessing oysters under higher catch levels. Potential conflict is highest under Option 4. However, MFish considers the level of non-commercial harvest within the OYS 7C fishery is relatively small and generally occurs away from the main commercial oyster beds within Cloudy and Clifford Bays. MFish believes spatial conflict with other fishers will be mitigated by the industry's proposal to restrict commercial harvesting away from coastal areas. This will effectively allocate the most accessible oyster beds (ie, those beds found close to shore and within Port Underwood) to non-commercial fishers. In addition, commercial fishers are prohibited from taking dredge oysters between 1 September in any year and the last day of February in the following year (both days inclusive), and this serves to remove issues of conflict between commercial and non-commercial sectors over the main summer period.

Managing the impacts of fishing on the aquatic environment

46 MFish notes the main concerns raised by ECO and MRF in support of retaining the current TAC focus on the potential effects of fishing on associated species within and adjacent to areas where dredging will occur. Broadly, the rationale for their position can be summarised as follows:

- Industry did not provide an environmental impact assessment in support of a higher TAC;
- Industry is wrong to assume muddy and sandy areas have low biodiversity;
- There is nothing to prohibit industry from intensively dredging foul ground to expand fishing areas;
- The effects of oyster dredging on marine biodiversity in Foveaux Strait are well documented and suggest epifaunal reefs of encrusting bryozoans, ascidians, sponges and polychaetes are very vulnerable to dredging. The seafloor may take many years (>75 years) to recover once fishing has ceased;
- Dredging will severely impact on the benthic environment and on local finfish fisheries, including blue cod, through habitat modification. Finfish fishing will be affected through the loss of "rough, undisturbed foul ground"; and
- Government has clear responsibilities to manage the effects of fishing in accordance with MFish's *Statement of Intent 2005-08* and the *Strategy for the Environmental Effects of Fishing*.

47 MFish agrees with the views of ECO and MRF that the effects of fishing under a higher catch level are very important considerations in setting a TAC for the OYS 7C fishery. The management options seek to provide for the utilisation of fisheries resources while ensuring sustainability. This includes avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment. Further, the Act requires you to consider the effects of fishing on the wider aquatic environment in accordance with the environmental principles under s 9. These principles require you to take account of the following:

- Maintain associated or dependent species above a level that ensures their long-term viability;
- Maintain biological diversity of the aquatic environment; and
- Protect habitats of particular significance for fisheries management.

48 MFish accepts that harvesting of dredge oysters impacts on the soft, muddy benthic environment within Cloudy and Clifford Bays. These impacts affect both the oyster beds, and other invertebrate and fish species found in association with these beds. Under each higher TAC option, the potential impacts of increased fishing effort on the benthic environment will increase.

49 The 2007 survey indicates there are several areas within Cloudy and Clifford Bays where a wide range of sensitive invertebrate species occur (including soft corals, bryozoans, and

horse mussels). However, these species are predominately found in coastal areas and/or areas of foul ground, and are generally away from where the main dredge oyster beds occur.

50 In setting the TAC, MFish notes that fishing in the initial stage of developing the OYS 7C fishery will be constrained within two specific commercial harvest areas. These areas are largely away from sensitive areas (such as coastal areas) where reefs and hard substrates are more common and where biodiversity is likely to be higher. MFish understands that while there has been little historical dredging activity within the OYS 7C QMA, the main oyster beds are found in areas already subject to long-term bottom trawling. As such, the proposed commercial harvest areas for dredge oysters are unlikely to be in pristine condition with high biological diversity.

51 Concerns are also raised about the effects of dredging under higher catch levels on important finfish fisheries such as flatfish, gurnard, moki, and blue cod. MRF states that fishing will have a detrimental impact on the blue cod fishery through the disturbance of preferred benthic habitat such as reefs and cobble/stone areas, and reducing the number of larvae that circulate within Clifford Bay before entering the Marlborough Sounds. MFish does not have sufficient information to comment on the validity of these specific concerns, but accepts that fishing will have an impact on the benthic environment (both the oyster beds themselves and associated fish species), and that these impacts will increase under higher catch levels.

52 MFish highlights that no specific assessment on likely environmental effects has been undertaken to support industry's request for a TAC adjustment. As such, it is unknown whether the effects of increased dredging within the proposed harvest areas will have a detrimental impact on the benthic environment, or to what extent. Therefore, MFish considers it is appropriate that you act cautiously in setting a TAC in the absence of more quantitative information to assess the impacts of fishing. MFish notes the fisheries plan approach may provide a suitable context to review the need for research to get better information about the effects of fishing in the OYS 7C fishery.

TACC and Allowances

Non-commercial allowances

53 The NZRFC expresses concern that there is no commensurate increase to the recreational allowance under each proposed TAC option. Each option proposes to retain the existing allowance of one tonne for recreational interests. The NZRFC contends this allowance should be proportional or at the least 10% of the TAC level to prevent a future reduction to the amateur daily bag limit[92] in the event the fishery declines and there is a need to constrain harvest levels.

54 You have discretion to determine how to allocate an allowance for recreational interests in setting the TAC for the OYS 7C stock. MFish accepts that dredge oysters are an important species for many recreational fishers; however, the level of recreational take within the OYS 7C fishery is likely to be relatively small and generally away from the main commercial oyster beds within Cloudy and Clifford Bays. MFish notes Matthew Hardyment's comments that while recreational (and customary) harvest levels are unknown, they can be assumed to be minimal due to the adverse weather conditions in

[92] A daily bag limit for recreational fishers of 50 oysters per person and a minimum size limit of 58 mm applies.

Cook Strait. The MRF states that a "significant number" of their members extensively fish in Clifford Bay to catch tarakihi, blue cod and moki, and that commercial dredging will impact on these activities. MFish is unclear whether these members fish within the proposed commercial oyster harvest areas.

55 While MFish acknowledges NZRFC's concerns about future reductions to the amateur catch level under a declining stock level, the proposed TAC options should ensure the fishery remains sustainable in the long-term. No additional information was forthcoming from submitters that the current allowance of one tonne constrains recreational catches of dredge oysters to warrant a review of the recreational allowance at this time.

56 Submitters did not provide any additional information regarding the allowance for customary Māori interests under each TAC option. As such, MFish believes it is appropriate to retain the customary allowance at this time.

Other sources of fishing-related mortality

57 MFish agrees with the NZRFC's and SeaFIC's views that it is appropriate to set an allowance for other sources of fishing-related mortality that better reflects the level of incidental mortality of dredge oysters from fishing under higher catch levels. While there is no quantitative information to reliably determine the actual level of incidental mortality under each TAC option, it is reasonable to assume this mortality will increase as catch levels increase. Research in the Foveaux Strait oyster fishery indicates that incidental mortality caused by dredging is inversely proportional to the size of oysters: only a few legal sized oysters are killed by dredging, but 19-36% of spat (<10mm) are killed. This research suggests that incidental mortality from dredging may reduce recruitment in heavily fished areas at local scales, but is unlikely to be important at the scale of the entire fishery.

58 In the absence of information for the OYS 7C fishery, MFish considers it is appropriate to include a new allowance for other sources of fishing-related mortality under each option that is equivalent to 10% of the proposed TAC.

Total allowable commercial catch

59 The IPP proposed a TACC (ie, 2, 22, 47 and 97 tonnes) for each of the four TAC options. Each proposed TACC has been amended to reflect the inclusion of a new allowance for other sources of fishing-related mortality within the TAC and are shown in Table 3. The table includes a revised indicative estimate of the landed value of the commercial fishery under each option and is based on a port price of $6.75 per kg for dredge oysters within the adjacent OYS 7 fishery.

Table 3: Proposed TAC and TACC options (tonnes greenweight) including an indicative landed value estimate of dredge oysters under each option

Option	Proposed TAC (tonnes)	Proposed TACC (tonnes)	An estimate of the value of the commercial fishery
Option 1	5	2	$13 500
Option 2	25	20.5	$138 375
Option 3	50	43	$290 250
Option 4	100	88	$594 000

60 The potential immediate economic return to industry is greatest under the highest proposed TACC (Option 4) and simply reflects the greatest level of utilisation under the four options presented.

61 MFish agrees with industry's view that the value of the commercial fishery as reported in the IPP (based on port price of landed oysters) reflects an 'indicative' value only and does not take into account 'actual' costs of fishing (including fuel, crew wages, sanitation/biotoxins costs, etc.). There is currently no specific information available to better assess the economic value of the fishery under each of the TAC options. MFish understands that only a small number of vessels (possibly up to three vessels only) will operate in the OYS 7C fishery, and this is likely to increase the profitability derived from the fishery.

Other Management Issues

62 Greater commercial use of the fishery may require more MFish resources in terms of monitoring, surveillance and inspection to ensure accuracy of reporting. However, this would need to be accommodated within existing resources. An increased pressure on these resources is not expected to have a constraint on any of the options presented.

Statutory Considerations

63 In forming the management options, MFish has considered all the statutory obligations described in the Act. These are summarised below.

a) **Section 8:** The purpose of the Act is to provide for the utilisation of fisheries resources while ensuring sustainability. The proposed higher TAC options seek to enable the commercial sector to derive greater value from the OYS 7C fishery to reflect the available resources, while mitigating the effects of fishing on the benthic environment. Option 1 does not increase the opportunity for greater utilisation from the fishery.

b) **Section 13(2)(a):** Under s 13 of the Act, the TAC must be set at a level that ensures the stock is maintained at, or above, a level that can produce the B_{MSY} having regard to the interdependence of stocks. This paper presents a range of TAC options each with a different but uncertain likelihood of achieving this objective – the likelihood of ensuring the stock is maintained at, or above, a level that can produce the B_{MSY} decreases under higher catch levels.

c) **Section 9(a) and (b):** MFish has no evidence that maintaining biological diversity and associated or dependent species will be threatened by retaining the TAC at its current level. The effects of fishing on biological diversity and associated or dependent species will increase under higher catch levels. However, it is anticipated that the effects of fishing on some bycatch species will be managed under the QMS framework. In addition, the industry proposes to voluntarily constrain commercial dredging to two specific areas to mitigate the effects of fishing on the benthic environment.

d) **Section 9(c):** MFish has not identified any habitats of particular significance for fisheries management with regards to the OYS 7C stock. MFish notes that dredging can have adverse effects on the benthic environment. Dredging, especially in areas with high silt levels, can potentially remove settlement surfaces and suspend silt, which can cause high mortality of newly settled recruits for various invertebrate species.

e) **Section 5(a) and (b):** MFish states the s 5 considerations arising from New Zealand's international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed by the TAC options discussed in this paper.

f) **Section 11(1)(a):** The effects of dredging on the OYS 7C stock and the aquatic environment under the current TAC are negligible. MFish notes that dredging under a higher catch level will have an increased impact on the benthic environment within the OYS 7C QMA. These impacts affect both the oyster beds and other invertebrate and fish species found in association with these beds. While the fishery has been subject to very little commercial dredging to date, the bottom type where dredge oyster beds occur is likely to have already been modified by long-term commercial bottom trawling. Industry is proposing voluntary measures to mitigate the impacts of fishing under a higher TAC.

g) **Section 11(1)(b):** The commercial sector is restricted to a minimum size limit of 58 mm for dredge oysters, as well as a closed season from 1 September in any year and the last day of February in the following year (both days inclusive). There is a daily bag limit for recreational fishers of 50 oysters per person and the minimum size limit of 58 mm also applies.

h) **Section 11(1)(c):** MFish recognises that dredge oyster stocks can be inherently variable and that discrete oyster beds are prone to fluctuations in abundance that can render them susceptible to localised depletion.

i) **Section 11(2A)(b):** There are no measures that have been adopted in an approved fisheries plan that would have a bearing on the setting of a TAC for the OYS 7C stock.

j) **Section 11(2A)(a and c):** There are no fisheries or conservation service decisions, or any decisions not to require fisheries or conservation services that are relevant to setting a TAC for the OYS 7C stock.

k) **Section 11(2)(a and b):** There are no considerations in any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991 or the Conservation Act 1987 that are specifically relevant to setting a TAC for the OYS 7C stock.

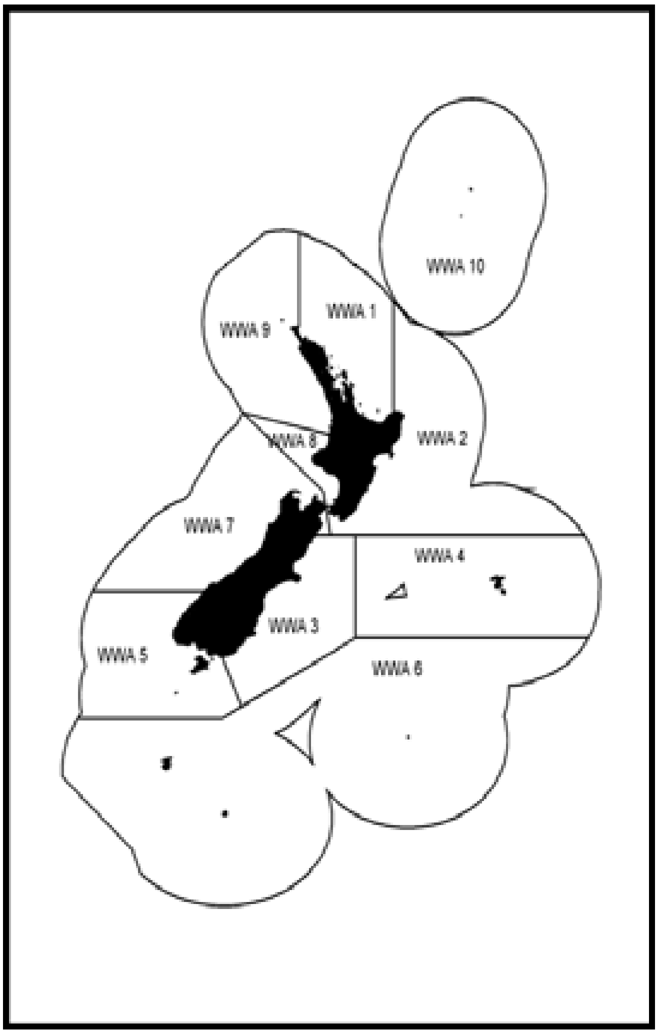
l) **Section 11(2)(c):** The considerations of ss 7 and 8 of the Hauraki Gulf Marine Park Act 2000 are not relevant to setting a TAC for the OYS 7C stock.

m) **Section 21(1)(a and b) and (4)(i and ii) and (5):** The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. There are no mātaitai within the OYS 7C QMA. No area has been closed or fishing method restricted under s 186A due to issues associated with dredge oysters. There are no areas closed to fishing under s 311 at this time.

n) **Section 10:** MFish has relied on the May 2007 survey report (TAL07402) prepared by the National Institute for Water and Atmospheric Research (NIWA) on behalf of the OYS 7C quota owners as its principle source of stock assessment information in developing management options presented in this paper. This is considered to be the best available information at this time.

WHITE WAREHOU (WWA 5B) – FINAL ADVICE

Figure 1: Current QMAs for white warehou



Executive Summary

1 You are asked to set a Total Allowable Catch (TAC), Total Allowable Commercial Catch (TACC) and allowances for recreational, customary and other sources of mortality for the new white warehou quota management area (QMA) 5B (WWA 5B), created as a result of the pending amalgamation of WWA5 and WWA6 on 1 October 2007.

2 An Initial Position Paper (IPP), which MFish consulted on with stakeholders and tangata whenua in 2005 and 2007, proposed to set a TAC for the new QMA based on the sum of the TACs for WWA5 and WWA6 (2,621 tonnes); to set a TACC based on the sum of the TACCs in WWA5 and WWA6 (2,617 tonnes); to set an allowance of 2 tonnes for recreational interests; to set an allowance of 2 tonnes for customary fishing interests; and no allowance for other sources of mortality.

3 Although submissions supported the amalgamation, none made any specific reference to the TAC, TACC or allowances. MFish's proposal is unchanged from the IPP.

4 MFish currently has no sustainability concerns for this fishery. White warehou is predominantly a bycatch species for the hoki fishery. As such, catch volumes are influenced by fishing patterns for target species.

5 No new information has become available to suggest that a different approach is required to the way that the original TACs were set.

Summary of Options

Initial Proposal

6 MFish proposes that:

a) The Total Allowable Catch (TAC) for WWA5B is to be the sum of the existing TACs for WWA5 and WWA6, ie, 2,621 tonnes;

b) The Total Allowable Commercial Catch (TACC) is to be the sum of the existing TACCs for WWA5 and WWA6, ie, 2,617 tonnes;

c) An allowance of 2 tonnes be made for recreational fishing interests;

d) An allowance of 2 tonnes be made for customary fishing interests; and

e) No allowance be made for other sources of mortality.

Final Proposal

7 The proposal is unchanged from the IPP.

Background

8 In May 2007 you agreed to progress a request from quota owners holding approximately 80% of quota shares in quota management areas 5 & 6 for white warehou (WWA 5 & 6) recommending the making of an Order-in-Council to amalgamate the two QMAs. This followed a period of consultation on the proposed amalgamation between MFish and quota owners, including mandated iwi organisations. Quota owners' representatives and Te Ohu Kai Moana also consulted with quota owners on the proposal and the quota share allocation that would result from the amalgamation.

9 On 28 June 2007, the Fisheries (Amalgamation of Quota Management Areas) Order 2007 was notified in the New Zealand *Gazette*. The Order notifies that WWA 5 & 6 will be amalgamated with effect from 1 October 2007 (the Fisheries Act 1996 requires that the Order must be made no fewer than 90 days before it comes into force).

10 In order to give final effect to the amalgamation, it is necessary to set the TAC and TACC for the new WWA5B.

Consultation

11 MFish undertook two rounds of consultation with stakeholders on the proposed amalgamation of WWA5 and WWA6, the first in 2005 and the second in 2007. The IPP in both cases contained the same proposals for setting of the TAC, TACC and recreational and customary allowances. Under s 25(3) of the Fisheries Act 1996, the Minister of Fisheries must consult with the persons and organisations considered by the Minister to be representative of those classes of persons having an interest in the relevant QMA, including Maori, recreational, commercial and environmental interests. MFish consulted on the proposed amalgamation with all quota shareholders in WWA5 and 6, local iwi, environmental non-governmental organisations and national recreational fishing organisations. While consulting on the amalgamation, MFish also consulted on the proposed TAC and TACC for WWA5B.

12 Under s 12(1) of the 1996 Act, when setting a sustainability measure including a TAC, you are required to consult with such persons or organisations as you consider are representative of those classes of persons having an interest in the stock or the effects of fishing on the aquatic environment in the area concerned. These persons or organisations include Maori, environmental, commercial and recreational interests. You are also required to provide for the input and participation of tangata whenua having a non-commercial interest in the stock concerned, or an interest in the effects of fishing on the aquatic environment in the area concerned and have particular regard to kaitiakitanga.

13 Under s 21(2) of the 1996 Act, before setting or varying a TACC for any quota management stock, you are required to consult with such persons or organisations as you consider are representative of those classes or persons having an interest in the setting of the TACC including Maori, environmental, commercial and recreational interests.

14 MFish received two submissions in 2005 and three submissions in 2007 from stakeholders in regard to the proposed amalgamation. All submitters supported the proposal to amalgamate WWA5 and 6, with the exception of Te Ohu Kai Moana (TOKM) in 2005. TOKM opposed it on the grounds that the Maori Fisheries Act 2004 did not provide TOKM with the flexibility to adjust the allocation of settlement quota to accommodate the amalgamation of WWA 6 and WWA6. This concern was addressed by the Maori Fisheries Amendment Act 2006, thus paving the way for the amalgamation to proceed this year. TOKM now support the amalgamation.

15 None of the submissions in 2005 or 2007 made any specific comment in regard to the proposed TAC, TACC, or allowances.

Rationale for Management Options

16 The current TACs, TACCs and allowances for WWA5 and WWA6 are as follows (figures in tonnes):

Stock	TAC	TACC	Recreational Allowance	Customary Allowance
WWA5	2,129	2,127	1	1
WWA6	492	490	1	1

17 These catch limits have remained unchanged since the TAC and TACC were set for the 1998-99 fishing year.

18 MFish proposes that the TAC for WWA5B is set as the sum of the current TACs as follows (figures in tonnes):

Stock	TAC
WWA5	2,129
WWA6	492
WWA5B	2,621

19 The rationale for the setting of the current TACCs is considered to still be sound. MFish considers that there is no new information has become available to suggest that a different approach is required to the way that the original TACCs were set.

20 The original TACCs were based on average landings during either the period 1982–83 to 1996–97 for those fishstocks considered to be stable (WWA 1, 2, 3, 4, 6, 7, 8, 9 and 10), or the period 1994–96 to 1996–97 for the fishstock considered to be developing (WWA5). MFish revised the landing data used for 1990–91 and 1991–92 years with the checked data used in the determination of provisional catch history (PCH). The classification of the WWA2 and WWA4 fishstocks changed from stable to developing because the highest catches recorded in these fisheries were within the previous three completed fishing years. Also, the period over which average landings was calculated for WWA1 and WWA6 was changed to better reflect the level of recent landings.

21 MFish considered that WWA catches have been modestly underreported. As a result, 10% was added to the TACCs calculated from the average period of landings. This 10% was to recognise that white warehou can be both a target and bycatch species in different circumstances and over time, and minor catch components may not have been fully recorded on the catch effort reporting forms. All TACCs were rounded up to the nearest tonne.

22 MFish currently has no sustainability concerns for this fishery. White warehou is predominantly a bycatch species for the hoki fishery. As such, catch volumes are influenced by fishing patterns for target species. MFish will continue to monitor the TAC/TACC following amalgamation and provide further advice to the Minister on appropriate catch levels if catch against the TAC/TACC necessitates a review.

Recreational and Customary

23 A nominal allowance of two tonnes was made for non-commercial catch (i.e. one tonne for recreational and one tonne for customary fishing) for each QMA when the species was introduced into the QMS in 1998.

24 It is proposed that an allowance of two tonnes each be made for recreational and customary fishing in the new QMA, which is the sum of the existing allowances.

Recreational Interests

25 White warehou in areas 5 & 6 area are principally a by-catch of the hoki fleet. The recreational take of white warehou is likely to be very small given its distribution and depth preference of 150 to 800 metres.

26 The 2007 Fishery Assessment Plenary[93] noted that the recreational take of white warehou is likely to be very small given its distribution and depth preferences. No white warehou were reported from recreational surveys undertaken in 1991-94, although warehou were not always recorded by species. No submissions were received from recreational fishers on the proposed TAC and/or TACC.

27 MFish believes that the proposed allowance of two tonnes for recreational interests is adequate to provide for the social, cultural and economic well-being of recreational fishers (s 8), given the likelihood of very limited recreational fishing in the new WWA5B.

Maori Customary Fishing Interests

28 The 2007 Plenary noted that no quantitative information is available on the current level of Maori customary take. However, it is expected that this is likely to be low for the same reasons that recreational take is likely to be low. No submissions were received from Maori customary fishers on the proposed TAC and/or TACC.

29 MFish believes that the proposed allowance of two tonnes for Maori customary fishing interests is adequate to provide for their social, cultural and economic well-being (s 8), given the likelihood of very limited customary fishing in WWA5B.

Other Sources of Mortality

30 The 2007 Plenary stated that no information is available on other sources of mortality caused by fishing. No allowance is currently made in either the WWA5 or WWA6 TAC for other sources of mortality caused by fishing. It is proposed that no allowance be made in the new QMA.

31 The issue of fishing-related mortality for hoki by-catch species such as white warehou will be addressed in the deepwater fisheries plan for 'other sources of mortality caused by fishing'.

[93] Report from the Fishery Assessment Plenary, May 2007: Stock assessments and yield estimates, MFish Science Group, May 2007

Total Allowable Commercial Catch

32 White warehou catches in WWA5 and WWA6 have been less than the TACC, sometimes significantly, for every year since the species was introduced into the QMS in 1998-99.

WWA5

Fishing Year	% Caught
1998-99	60
1999-00	52
2000-01	33
2001-02	43
2002-03	47
2003-04	54
2004-05	74
2005-06	55

WWA6

Fishing Year	% Caught
1998-99	84
1999-00	44
2000-01	24
2001-02	45
2002-03	93
2003-04	43
2004-05	89
2005-06	51

33 MFish considers there are two primary reasons for catches being less than the TACC. The first is economic reasons, and the second is that part of the ACE was unavailable for fishing as it was held by the Crown until 1 October 2003.

Social and Cultural Well-being factors

34 The information MFish has on the impact on social and cultural well-being factors that might arise from the amalgamation of the two QMAs and the setting of a TAC is unknown. WWA5 & 6 is not a significant recreational or Maori customary fishery. As stated earlier, little is known about recent or current harvest levels in these fisheries.

Economic well-being and factors

35 When WWA5 & 6 are amalgamated into WWA5B on 1 October 2007, the fishery will account for about 60% of total white warehou landings ((2005/06 figures). Eight companies hold 80% of WWA5B quota; the remainder is settlement quota held by mandated iwi organisations (MIOs).

36 Because white warehou is predominantly a bycatch species, total white warehou catch is dependent upon fishing patterns for the target trawl species of hoki and silver warehou, and to a lesser extent hake, ling and scampi. The 2007 Plenary notes that target fishing on white warehou has been reported from around Sub-Antarctic waters and on the west coast of the South Island, with the best catch rates recorded in the southern areas. Target fisheries accounted for only 8% of the total white warehou catch for the years 1988-89 to 1994-95.

37 Although fishing effort focussed on white warehou has been much reduced in these areas in recent years (the hoki TACC has been reduced considerably over this time), catch per unit effort (CPUEs) have remained constant or improved over the same period. White warehou is predominantly a bycatch species for the hoki fishery. As such, catch volumes are influenced by fishing patterns for target species.

38 In the past, WWA has been a highly preferred species in Japan due to its seasonally high fat content and its similarity to a local species, Ao-hirasi. In recent years, a fall in price in the Japanese market has substantially reduced the profit associated with fishing WWA, so

vessels have spent less time fishing this species and more time fishing other species providing better net returns to the vessel.

39 Unlike most trawled species, the fat content of WWA is a determining factor in the ultimate price. Environmental conditions have resulted in the Southern area WWA having a particularly low fat content in recent years which impacts on the economic benefit obtained from WWA catch.

40 The amalgamation of WWA 5 and 6 into WWA5B and the setting of the proposed TAC and TACC is likely to increase the economic well-being of quota owners by enabling them to catch the TACC more efficiently.

41 The amalgamation of WWA5 & 6 is likely to provide for the enhanced utilisation of the WWA resource while also enhancing the ability to manage these fisheries sustainably. The amalgamation is likely to:

- allow for fish to be targeted more efficiently be enabling fishers to better respond to changes in white warehou distribution over the entire stock area;
- remove constraints on harvesting activities on or near the boundary of the two areas where the commercial fishery is concentrated;
- remove the need for fishers to obtain additional Annual Catch Entitlement (ACE) and/or pay deemed values to manage catch across the two QMAs;
- increase the economic well-being of quota owners by enabling them to catch the TACC more efficiently.
- enable better decisions to be made about the impact of fishing on the sustainability of the stock, including the impact of the Total Allowable Catch (TAC) and Total Allowable Commercial Catch (TACC) on the stock;
- allow for the entire biological range of the stock to be fished, rather than fishing effort being concentrated on certain areas; and
- result in better information about the overall impact of fishing on the stock as any potential for misreporting of catch between QMA5 & 6 will be removed.

Crown-held Quota

42 The Crown held 447 tonnes of WWA5 ACE until 1 October 2003, at which time it was reallocated to quota owners. Prior to this the Annual Catch Entitlement (ACE) generated by the Crown quota in WWA5 has not been caught in any fishing year since white warehou was introduced into the QMS in 1998. This contributed to the TAC and TACC being undercaught in previous years.

Stock Status and Biological Characteristics

43 The 2007 Fishery Assessment Plenary reported that it is not known whether recent catches of white warehou stocks are sustainable or if they are at levels that will allow the stock to move towards a size that will support the maximum sustainable yield. No assessments are available for any stocks of white warehou, therefore estimates of biomass and yield are not available

Statutory Considerations

44 MFish considers the options proposed are consistent with the obligations stated under the 1996 Act. Appendix I contains a discussion on how the proposal meets specific statutory criteria. The proposal recommends that you set the TAC under s 13(2)(a) and the TACC under s 20(1).

APPENDIX I – STATUTORY CONSIDERATIONS

45 In reviewing the possible setting of a TAC and TACC for WWA5B the following statutory considerations have been taken into account. In accordance with the Fisheries Act 1996 (FA96):

46 When setting or varying the TAC and TACC for a stock under the FA96, you are required to consider a series of principles and factors:

a) **Section 13(2)** MFish recommends that you set a TAC pursuant to s 13(2)(a) to maintain WWA5B at or above a level that can produce MSY. An assessment of the current status of the entire WWA5B stock relative to B_{MSY} is not available and no new stock assessment information is available this year.

b) MFish considers that the proposed TAC should maintain the stock to a biomass that can produce MSY. The specific considerations set out in s 13(2)(a) include having regard to the interdependence of stocks.

   i) The interdependence of stocks for WWA5B (as required by s 13(2)(a)). WWA is predominantly a bycatch species, total white warehou catch is dependent upon fishing patterns for the target trawl species of hoki and silver warehou, and to a lesser extent hake, ling and scampi. Setting the TAC for WWA5B should not affect those stocks. However, any TAC adjustment for those stocks, in particular may affect WWA5B catch.

c) **Sections 5(a) and (b)** require the Act to be interpreted consistently with New Zealand's international obligations relating to fishing and with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. Provisions of general international instruments such as the United Nations Convention on the Law of the Sea 1982 (UNCLOS) and the United Nations Agreement on the Straddling Fish Stocks and Highly Migratory Fish Stocks 1995 (Fish Stocks Agreement) have been implemented through the provisions of the Fisheries Act 1996. MFish considers that the options are consistent with both New Zealand's international obligations relating to fishing and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.

d) **Section 8** of the Act states the purpose of the Act as being to provide for the utilisation of fisheries resources while ensuring sustainability, and defines the meanings of utilisation and sustainability. The management option presented in the IPP seeks to achieve the purpose of the Act. The setting of a TAC for WWA5B that is the sum of the WWA5 & 6 TACs will result in an enhanced ability to provide for the utilisation of the fishery while ensuring sustainability. It will, among other things, allow for fish to be targeted more efficiently by enabling fishers to better respond to changes in WWA distribution, remove constraints on harvesting activities at or near the boundary of the two areas where the commercial fishery is concentrated, and allow for the entire range of the stock to be fished, rather than fishing effort being concentrated on certain areas.

e) **Sections 9(a) and (b)** require you to take into account that associated or dependent species (those that are not harvested) be maintained at or above a level that ensures their long-term viability, and that the biological diversity of the aquatic environment should be maintained. The WWA5B fishery is predominantly a bycatch of the hoki fishery. MFish will be providing advice to you on management options to maintain or reduce the TAC/TACC for the western stock of hoki. As none of the options for the hoki stock recommend an increase in fishing effort, the likely adverse impact on bycatch species such as white warehou is likely to be small. Similarly, the prposals contained in this paper are unlikely to have additional adverse implications for trawling on seabirds or marine mammals. MFish therefore considers that the proposed TAC for WWA5B is unlikely to have any impact on the long-term viability of associated or dependent species or on the biological diversity of the aquatic environment.

f) **Section 9(c)** requires you to take into account the principle that habitat of particular importance for fisheries management should be protected. White warehou is predominantly a bycatch of the hoki fishery, and as such catches in the western stock are harvested using mid-water trawl gear, which is unlikely to result in trawl disturbances which may alter the benthic habitat.

g) **Section 10** of the Act sets out the information principles, which require that decisions be based on the best available information, taking into account any uncertainty in that information, and applying caution when information is uncertain, unreliable, or inadequate. In accordance with s 10(d), the absence of or any uncertainty in any information should not be used as a reason to postpone, or fail to take, any measure to achieve the purpose of the Act, including providing for utilisation at levels considered to be sustainable. The status of the WWA5B stock complex relative to B_{MSY} is uncertain. In the body of the paper, MFish has endeavoured to set out the relevant uncertainty in, and inadequacy of, that information so that the appropriate caution can be applied in making your decision. MFish considers that the proposals provided are derived from the best available information and cover an appropriate range of caution in response to the uncertainty in that information.

h) **Section 11(1)(a):** Before setting the TAC for WWA5B, you must take into account any effects of fishing on any stock and the aquatic environment. No information about any effects of fishing on any stock or on the aquatic environment additional to that discussed elsewhere in the paper is considered relevant to the consideration of sustainability measures for WW5B at this time.

i) **Section 11(1)(b):** Before setting the TAC for WWA5B, you must take into account any existing controls under the 1996 Act that apply to the stock or area concerned. Pre-amalgamation of WWA5 and WWA6 into WWA5B, there was a TAC and TACC for WWA5 and WWA6 respectively, and an allowance for incidental fishing-related mortality. Due to the amalgamation, a new TAC and TACC is required to be set for WWA5B. No other controls under the Act apply specifically to WWA5B.

j) **Section 11(1)(c):** Before setting the TAC for WWA5B, you must take into account the natural variability of the stock. No biomass estimates are available for white warehou, therefore it is unknown whether the fishery is prone to fluctuations in biomass over time.

k) **Sections 11(2)(a) and (b):** Before varying the TAC for WWA5B, you must have regard to any provisions of any regional policy or plan under the Resource Management Act 1991 and any management strategy or plan under the Conservation Act 1997 that apply to the coastal marine area and you consider relevant. MFish is not aware of any such provisions that should be taken into account for WWA5B.

l) **Section 11(2)(c):** Before varying the TAC for WWA5B, you must have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 that apply to the coastal marine area and you consider relevant. The distribution of white warehou in the WWA5B QMA does not intersect with the Park boundaries.

m) **Section 11(2A)(b):** Before setting the TAC for WWA5B, you must take account of any relevant and approved fisheries plans. There is currently no fisheries plan in place in the white warehou fishery.

n) **Sections 11(2A)(a) and (c):** Before setting the TAC for WWA5B, you must take into account any conservation or fisheries service, or any decision not to require such services. MFish does not consider that existing or proposed services materially affect the proposed TAC options. No decision has been made not to require a service that would be relevant to the WWA5B fishery.

o) **Section 20 and 21** specify a number of matters that must be taken into account when setting or varying a TACC. Section 21 requires you to allow for non-commercial Maori and recreational fishing interests, and other sources of fishing-related mortality when setting or varying the TACC. Allowance has bee made for the interests of recreational and customary fishers in proposing the TACCs. These interests and other sources of fishing-related mortality are discussed further in the main body of this paper.

p) **Section 21(4)** also requires that any mātaitai reserve or closure/restriction under s 186A to facilitate customary fishing be taken into account. No mātaitai reserves or s 186A measures intersect with the WWA fishery.

q) **Section 21(5)** also requires that any regulations to prohibit fishing made under s 311 be taken into account when setting allowances for recreational interests. No restrictions under s 311 have been placed on fishing in any area within WWA5B.

RUBYFISH (RBY 8) TECHNICAL TAC AND TACC ADJUSTMENT – FINAL ADVICE

1 This paper provides you with the Ministry of Fisheries recommendation for a technical alteration to the total allowable catch (TAC) and total allowable commercial catch (TACC) for ruby fish in area 8 (RBY8) from 55 tonnes to 6 tonnes, to correct an administrative error.

Background information

2 As part of the October 2006 sustainability round a number of stocks, classed as low knowledge stocks, had their TACs, TACCs and their deemed value rates adjusted. The new TACs and TACCs were set using an average of landings over the past seven years. In the initial position paper (IPP) of 20 June 2006 the proposed TACC for RBY8 was set at 5 tonnes.

3 Following receipt of submissions on the IPP of 20 June 2006, you were provided with an option of setting TACs and TACCs with an additional 10% to take account of the fact that the previous seven years landing data varied in the early years as fishers got used to the species being part of the QMS. This meant the TAC and TACC for RBY8 would become 5.5 tonnes, which should have been rounded up to 6 tonnes. However, an error in the analysis table listed the new TAC and TACC as 55 tonnes and this error was transferred to the Final Advice Paper (FAP) and was subsequently gazetted.

4 The IPP of 19 June 2007 proposed that the TAC and TACC for RBY8 be adjusted from 55 tonnes to 6 tonnes.

Submissions received

5 Submissions regarding this proposal were received from:

a) Anton's Seafoods Limited (Anton's)

b) Seafood Industry Council (SeaFIC)

c) Environment and Conservation Organisations of NZ Inc (ECO)

d) New Zealand Recreational Fishing Council (NZRFC)

6 All submissions supported the proposal to adjust the TAC and TACC from 55 tonnes to 6 tonnes.

7 Anton's note that in the last three fishing seasons, catch levels from RBY8 have exceeded the TACC and have been as much as 8 tonnes[94]. Anton's has requested the TAC and TACC is set at 20 tonnes rather than the 6 tonnes as proposed in the IPP of 19 June 2007. Anton's believes this will permit further development of this fishery without compromising the sustainability of the stock.

[94] Prior to the start of the current fishing season the TAC and TACC for RBY8 was 1 tonne.

8 MFish notes that the purpose of the IPP was not to review to the RBY8 TAC and TACC but to correct an administrative error made when the TAC and TACC were reviewed and increased in 2006. Therefore, MFish considers Anton's request is beyond the scope of this paper. MFish does note that when the TAC and TACC were reviewed in 2006 they were subsequently increased from 1 tonne to 6 tonnes to reflect an average of RBY8 landings over the past seven years. There was insufficient information available to suggest that a higher TAC or TACC should be set for RBY8 at that time.

Management option

9 MFish recommends that the TAC and TACC for RBY8 be amended from 55 tonnes to 6 tonnes so that it reflects the original proposal detailed in the low knowledge stocks IPP of 20 June 2006.

10 MFish considers this correction to the TAC and TACC is permitted under section 13 of the Interpretation Act 1999. Section 13 of the Interpretation Act provides that the power to do any act or thing may be exercised to correct an error in a previous exercise of the power even though the power is not generally capable of being exercised more than once. The authority which was used to approve the mistaken TACC of 55 tonnes can therefore be used again to correct that error.

Assessment of management option

11 The correction to the TAC and TACC may have implications for commercial quota owners who own RBY8 quota shares particularly if they invested in these quota shares on the basis of the incorrect TACC increase. However an assessment of quota trades for the period August 2006 to April 2007 indicates that no quota shares have been traded during this period. Further, no submissions were received from RBY8 quota owners claiming they will be affected by the proposed correction to the TAC and TACC.

12 An analysis of landings of RBY8 against the TACC indicates that between 1 October 2006 and 30 July 2007 only 351kg of RBY8 has been harvested. This is in comparison to 8,224 kg reported for the same period last year. This suggests that fishers have not deliberately set out to harvest the higher RBY8 TACC.

Statutory considerations

13 As discussed in paragraph 5 above, MFish considers this correction is permitted under section 13 of the Interpretation Act 1999.