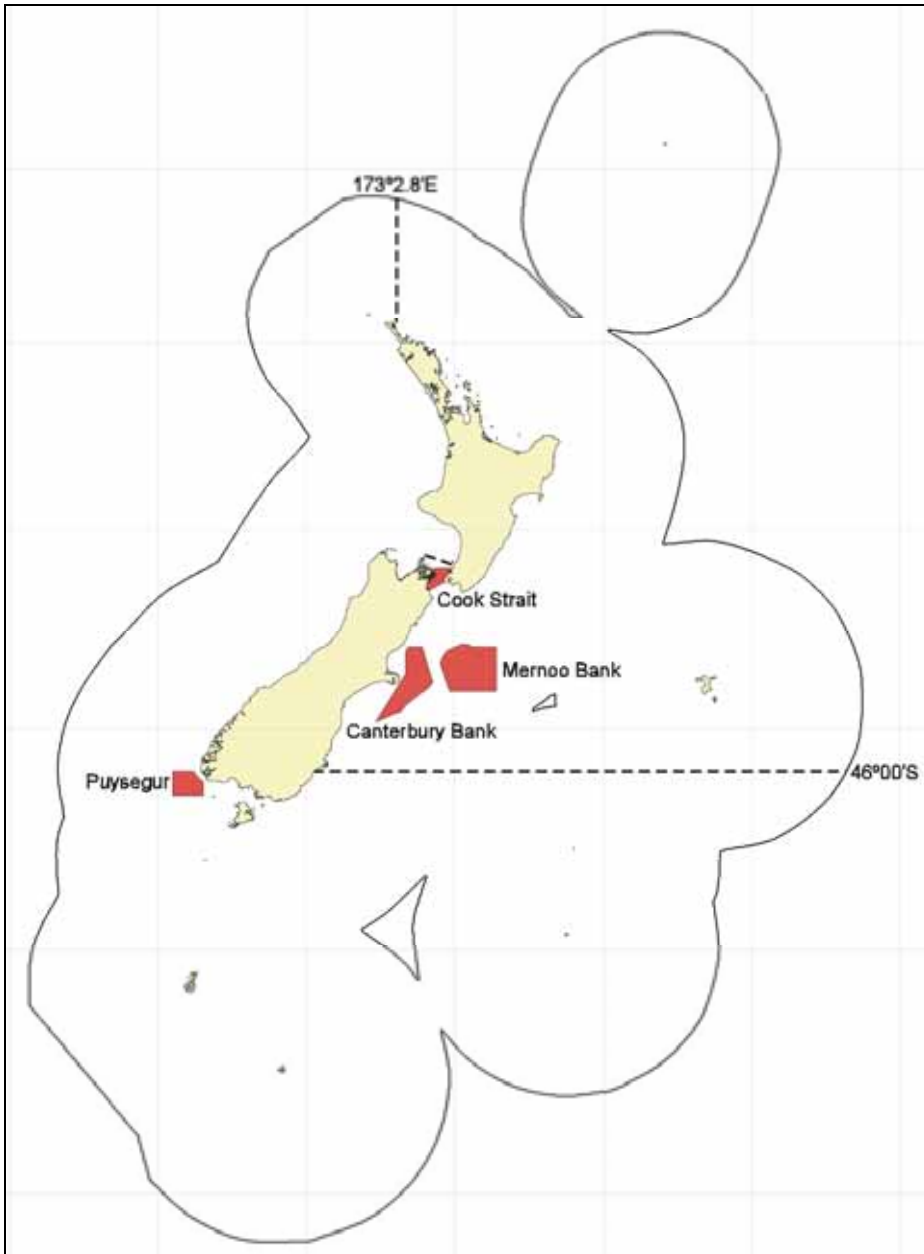


HOKI – FINAL ADVICE

- 1 This paper provides you with the Ministry of Fisheries (MFish) recommendations for the hoki fishery for the 2007-08 fishing season.

Figure 1: The hoki east-west catch split boundary and the hoki closed areas.



Executive summary

- 2 The hoki fishery is managed as one quota management system (QMS) stock, HOK1, although HOK1 is considered to be two stocks, an eastern stock and a western stock. The 2007 hoki stock assessment results indicate that the western stock is below the biomass that

can produce the maximum sustainable yield (B_{MSY}) but the eastern stock is at or above B_{MSY} .

- 3 The 2007 stock assessment predicts that the western stock will rebuild only if recruitment is better than it has been in recent years or catches in the western stock are reduced in comparison to recent catch levels.
- 4 In June 2007 MFish consulted on three management options in the hoki initial position paper (IPP) and these options remain unchanged in this final advice. MFish proposes that you consider the TAC pursuant to section 13(2)(b) of the Fisheries Act 1996 to restore HOK1, in a way and rate, to at or above a level that can produce the maximum sustainable yield. The stock assessment model runs used to develop these management options were based on recent hoki recruitment levels. This is a cautious approach and reflects the below average recruitment that has occurred in the western stock from 1995 to 2003.
- 5 Option 1 contributes to a stock increase by reducing catch levels in the western stock compared to the past two fishing seasons. Option 2 increases stock size through a reduction in the hoki total allowable commercial catch (TACC) for the 2007-08 fishing season and effecting that reduction by reducing catch from the western stock only. Option 3 provides for an increase in stock size by transferring catch from the western stock to the eastern stock while maintaining the TACC at its current level.
- 6 All three management options will facilitate a rebuild towards B_{MSY} for HOK1 overall, though at differing rates and in different ways. However, none of the options is predicted to rebuild the western stock to B_{MSY} within 5 years. Returning the western stock to B_{MSY} in that timeframe is only possible by closing the western stock to all fishing effort. You are not obliged to rebuild the stock in that time frame; your decision on both the way and rate of rebuild must consider social cultural and economic factors.
- 7 A wide range of views were received through the submissions process. Some stakeholders support retaining the existing TAC and TACC while others consider the only practical option available to you is to reduce the fishing effort on the western stock through a TAC and TACC reduction. All three management options are available for your consideration and in choosing one management option over another you must decide on the way you want to achieve a rebuild and the timeframe within which this rebuild will occur.
- 8 All options rely on industry adhering to the voluntary east: west catch split arrangement. Given the issues associated with codes of practice and voluntary initiatives in the past you must have confidence that the voluntary initiatives in place to support the hoki rebuild have integrity. MFish believes this to be the case, and evidence form the 2006-07 fishery supports this view.
- 9 The deemed value rates for hoki were also reviewed for the 2007-08 fishing season as part of the wider deemed value review process and are provided in separate advice.

Summary of options

10 The options available for your consideration are unchanged from the IPP.

Option 1 (status quo)

AGREE to retain the existing HOK1 TAC and TACC of 101,040 and 100,000 tonnes respectively; and request industry to retain the existing catch split arrangement so that 60% of the TACC will be harvested from the eastern stock and the remaining 40% of the TACC being harvested from the western stock.

This option is not strictly the *status quo* given that the western limit has been exceeded in the past two fishing seasons; rather this option reflects the harvest levels that should have occurred in the 2004-05 and 2005-06 fishing seasons and has likely occurred in 2006-07.

OR

Option 2

AGREE to reduce the HOK1 TAC from 101,040 tonnes to 81,040 tonnes and the TACC from 100,000 tonnes to 80,000 tonnes (a reduction of 20%); and request industry to alter the voluntary catch split arrangement so that 60,000 tonnes (75% of the TACC) are taken from the eastern stock and 20,000 tonnes (25% of the TACC) are taken from the western stock.

OR

Option 3:

AGREE to retain the existing HOK1 TAC and TACC of 101,040 and 100,000 tonnes respectively; and request industry alter the voluntary catch split arrangement so that 65% of the catch is taken from the eastern stock and that this additional 5,000 tonnes is caught from the Cook Strait fishery so as to protect juvenile hoki found on the Chatham Rise.

11 You are not constrained to the options detailed above and you may to set the HOK1 TAC and TACC at a different level consistent with your obligations under the Act. MFish considers that setting the TAC at any point between 81,040 and 101,040 tonnes would be consistent with the provisions of s13(2)(b) and the Purpose of the Act.

Consultation

12 Your decision whether or not to adjust the TAC for HOK1 is a decision under sections 13(2)(b) and 13(4) 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 HOK1, the consultation requirements set out in section 21(2) apply.

13 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.

14 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.

Submissions Received

- 15 Submissions were received from the following:
- a) Deepwater Group Ltd (DWG)
 - b) Environment and Conservation Organisations of NZ Inc (ECO)
 - c) Independent Fisheries Ltd (Independent)
 - d) New Zealand Recreational Fishing Council (NZRFC)
 - e) Royal Forest and Bird Protection Society Inc (Forest & Bird)
 - f) Sanford Limited (Sanford)
 - g) Seafood Industry Council (SeaFIC)
 - h) Sealord Fishing (Sealord)
 - i) Solander and Aurora Group of Companies (Solander & Aurora)
 - j) Talley's Fisheries Ltd (Talley's)
 - k) Te Ohu Kai Moana (TOKM)
 - l) United Fisheries Ltd (United)
 - m) Vela Quota No. 1 Limited (Vela)
 - n) WWF – New Zealand (WWF).
- 16 A summary of submissions and copies of the submissions in full are included in Volume 2 and Volume 3 of the FAP.
- 17 Submissions revealed strongly held opposing views on where the hoki TAC and TACC should be set for the coming season. Some members of industry support Option 2 while others believed the TACC should remain unchanged at 100,000 but that improved stock performance could be achieved through altering the east: west catch split arrangement (Option 3). Two industry submissions supported Option 1 which would retain the existing TAC, TACC and catch split arrangement.
- 18 The DWG summarised the position amongst industry members as:
- a) 54% of quota owners are in favour of reducing the TACC to 80,000 while 46% of quota owners support the TACC remaining at 100,000.
 - b) 91% of quota owners recognise the need for and support a reduction in catch from the western stock for the 2007-08 season.

- 19 Neither Forest & Bird nor WWF support any of the options proposed in the IPP. They recommend that the TACC should be reduced to 60,000 tonnes and all western stock fisheries should be closed.

Background information

- 20 The hoki fishery is currently managed as one stock, HOK1, which covers fisheries management areas 1-9. The fishery consists of two distinct stocks, an eastern stock and a western stock. Within each stock there are the following defined fishing areas:
- a) Eastern hoki stock: Cook Strait, Chatham Rise, East Coast South Island (ECSI) and East Coast North Island (ECNI).
 - b) Western hoki stock: West Coast South Island (WCSI), Sub-Antarctic and Puysegur.
- 21 Juvenile hoki from both stocks mix on the Chatham Rise. They are thought to migrate to the eastern or western stock on maturity.
- 22 The main hoki fishery operates from mid-July to late August on the WCSI where hoki aggregate to spawn. A second major spawning fishery occurs in Cook Strait where the season runs from late June to mid-September peaking in July and August. Small catches of spawning hoki are taken from other spawning grounds off ECSI and, late in the season, at Puysegur Bank.
- 23 Outside the spawning season there is a substantial fishery on the Chatham Rise and a smaller fishery in the Sub-Antarctic. The Chatham Rise fishery generally has constant catch levels across all months except July to September when catches are lower because fishing vessels move to their spawning ground. In the Sub-Antarctic, catches typically peak in April to June. There is also a small ECNI hoki fishery.
- 24 In 2001 industry implemented a voluntary catch splitting arrangement to manage fishing effort across these two stocks. This catch split arrangement has altered since it was first implemented but, since 2004 it has been set so that 60% of the TACC should be taken from the eastern stock and 40% from the western stock.
- 25 Through the hoki Code of Practice, industry has also implemented a range of voluntary measures to protect juvenile hoki. These measures include closing four areas to hoki targeting, believed to be significant to juvenile hoki (see figure 1). These areas are still accessible to vessels targeting other species such as scampi, ling and squid.
- 26 Three operators own 65% of hoki quota. These three quota owners also represent 62% of ACE fishers. In 2006 the value of hoki quota was estimated to be \$627 m.
- 27 Hoki is one of the most important export earners for the fisheries sector. In 2006, 42,000 tonnes (product weight) of hoki were exported realising a value of \$156 m. The destination for much of these exports is China where the product is processed for re-export into Europe and the USA. The hoki fishery received Marine Stewardship Council Certification in 2001. The fishery is currently seeking recertification.

Rationale for Management intervention

- 28 Estimates of current biomass for the western stock, based on current recruitment, are between 15-24% B_0 which is approximately 50% lower than the recommended target of 30-40% B_0 . In contrast, the eastern stock appears to be at or above B_{MSY} . Current biomass for the stock is estimated to be between 37% and 51% B_0 . The status of the western stock means the entire HOK1 stock is also currently below B_{MSY} at 25-29% B_0 .
- 29 The decline in the western stock has been attributed to extended periods of poor recruitment for the period 1995 to 2001. Recruitment since 2001 is estimated to be better than that of 1995-2001, but is still below the long-term average. Hoki is predominantly a recruitment-driven fishery meaning that the landings and the biomass of the stock fluctuate in response to strong year classes. Likely causes of this poor recruitment are unknown and it is unclear if it is due to environmental factors, the effects of fishing activity on juvenile mortality or excess mortality of adult hoki (or some combination of all three). In the absence of good recruitment it is important to maintain a high spawning stock biomass.
- 30 Stock assessment model projections indicate that the biomass for the western stock will not increase unless future recruitment is better than it has been in recent years or catch from the fisheries that comprise the western stock is reduced compared to recent catch rates.
- 31 There is also a concern that in recent years there has been higher fishing mortality on juvenile hoki. This could impact on future recruitment if they are harvested before they mature.
- 32 The stock assessment process provided five-year stock projections across three model runs based on recent recruitment levels (1995-2003).⁶¹ Providing stock projections across a five year period ensures the variable nature of hoki stock recruitment is considered. If the stock assessment projections were based on long term recruitment levels (1975-2003), the 5 year projections of biomass for both eastern and western stock at current levels are at or above B_{MSY} . However, given the continued period of poor recruitment observed in the western stock the stock assessment working group and MFish agree that basing management decisions on model runs that assume recent recruitment levels is appropriate.

Analysis of management options

- 33 Under section 13 of the Act, a TAC must be set or varied with respect to the level of the entire quota management area stock. MFish proposes that, for the entire HOK1 stock, you consider the TAC pursuant to section 13(2)(b) to enable HOK1 to be restored to at or above B_{MSY} . Specifically, section 13(2)(b) provides that you set a TAC that:
- b) Enables the level of a stock whose current level is below that which can produce the maximum sustainable yield to be altered (13(2)(b))

⁶¹ The hoki stock assessment working group approved three model runs for the current stock assessment. Each model run is based on different assumptions to which the working group gave each equal weighting. Model runs 4.4 and 4.5 assume natal fidelity i.e. that hoki return to area they were spawned to spawn. Model run 4.7 does not assume natal fidelity.

- i) In a way and at a rate that will result in the stock being restored to at or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks; and
- ii) Within a period appropriate to the stock having regard to the biological characteristics of the stock and any environmental conditions affecting the stock;

34 Table 1 summarises the proposed management options which are described in more detail below. None of the management options proposed will effect a significant rebuild of the western stock in the short term although Option 2 will achieve a rebuild of HOK1 over the next five years. Under each option a greater rebuild of the western stock will only occur with better recruitment. Each of the options proposed will facilitate a rebuild of HOK1, will prevent the stock biomass from declining further and will put the hoki stock in a better position to benefit from improved recruitment should it occur in the future.

Table 1: Summary of proposed management options for HOK1 including predicted rebuild, based on recent recruitment, over a 5yr period.

Management option	TAC	TACC	Eastern stock limit	Western stock limit	5yr % Bo HOK1 stock	5yr % Bo Eastern stock	5yr % Bo Western stock
Option 1	101,040	100,000	60%	40%	27-31% B ₀	37-49% B ₀	18-25% B ₀
Option 2	81,040	80,000	75%	25%	30-35% B ₀	37-49% B ₀	23-29% B ₀
Option 3	101,040	100,000	65%	35%	27-31% B ₀	36-46% B ₀	19-26% B ₀

35 The 2007 stock assessment information indicates that all the management options proposed in the IPP will move the HOK1 stock towards B_{MSY}. The rate of rebuild and the way this rebuild is achieved are at your discretion. When deciding on an appropriate ‘way and rate’ in setting or varying the TAC, the Act requires you to:

- a) Have regard to the interdependence of stocks (s 13(2)(b)(i));
- b) Have regard to the biological characteristics and the environmental factors affecting the stock. (s 13(2)(b)(ii)); and
- c) Have regard to such social, economic and cultural factors that you consider relevant (s 13(3)).

36 These ‘way and rate’ statutory considerations are discussed in more detail in relation to each option in the following paragraphs but MFish considers the three options consulted on in the IPP remain valid management options for your consideration. All submissions received, with the exception of Forest and Bird and WWF, support one of these management options.

37 Both Forest & Bird and WWF believe that given the state of the western stock, the TAC and TACC should be set at 61,040 and 60,000 respectively. They also consider that all western stock fisheries should be closed and that the entire TACC should be harvested from the eastern stock.

38 While this approach is not excluded by s 13, MFish considers it would likely be inconsistent with the Purpose of the Act: although such an approach would provide for sustainability of the hoki stock, it would come at an unreasonable cost to utilisation of the hoki fishery.

39 In addition, MFish considers that the option proposed by Forest & Bird and WWF to reduce

the TAC by 40,000 tonnes should not be considered without further consultation with affected stakeholders since this is materially different to the options consulted on in the IPP. In effect, closing the western stock will significantly affect operations in the hoki fishery and will prevent fishers from harvesting target species in fisheries where hoki is a significant bycatch, such as ling (LIN7 and LIN5) and hake (HAK7). There are likely to be large short-term economic consequences of such a decision.

- 40 You may set the HOK1 TAC and TACC at any level consistent with your obligations under the Act. MFish considers that setting the TAC at any point between 81,040 and 101,040 tonnes would likely be consistent with the provisions of s 13(2)(b), s13(3) and therefore the purpose of the Act.

Option 1

- 41 Under this option the TAC and TACC would remain at 101,040 tonnes and 100,000 tonnes respectively and the voluntary catch arrangement would continue so that 60% of the TACC will come from the eastern stock and 40% from the western stock. This option is not strictly the *status quo* given that the western limit has been breached in the past two fishing seasons; rather this option reflects the harvest levels that should have occurred in the past two fishing seasons. This option will achieve only a small rebuild of the western stock over a five year period but the entire hoki stock could reach 27-31% B_0 , which is closer to the lower boundary of the target biomass (see table 1).

Option 2

- 42 Under Option 2 the TAC and TACC would be reduced by 20% to 81,040 and 80,000 tonnes. In addition the east: west voluntary catch split arrangement would be set so that 60,000 tonnes (75% of the TACC) is taken from the eastern stock with the remaining 20,000 tonnes (25% of the TACC) coming from the western stock. According to the model projections, this management option would facilitate the largest rebuild to the HOK1 stock: a projected rebuild to 30-35% B_0 over a five year period. This equates to a 20% improvement in the status of the stock over the next five years. Option 2 will also facilitate a rebuild of the western stock over a five year period, although it is likely to remain below B_{MSY} , at 23-29% B_0 , unless recruitment improves.

Option 3

- 43 Under this option, both the TAC and TACC would remain unchanged at 101,040 tonnes and 100,000 tonnes respectively for the 2007-08 fishing season. This option would result in a similar rate of rebuild to the HOK1 stock as would be achieved under Option 1 (27-31% B_0). However, a marginal improvement to the rebuild of the western stock, compared to Option 1, would be achieved through altering the catch split arrangement and shifting fishing effort from the western stock to the eastern stock.
- 44 This option would request 65% of the TACC to be taken from the eastern stock under the voluntary catch split arrangement. This is an additional 5,000 tonnes above what has been permitted in recent fishing seasons. In the past two fishing seasons, 60,000 tonnes of hoki was available for harvest from the eastern stock but this limit was not reached: in 2005-06 57,000 tonnes were harvested and in 2004-05, 59,000 tonnes were harvested.
- 45 There are concerns that increasing fishing pressure on the eastern stock might impact on

juvenile hoki and their ability to recruit to either of the spawning stock, particularly if this extra effort is exclusively focused on the Chatham Rise fishery. Therefore, in addition to altering the catch split arrangement, hoki quota owners will also be requested to catch only 35,000 tonnes of hoki from the Chatham Rise fishery. The remainder of the eastern stock allowance should be harvested from the Cook Strait and ECSI fisheries.

Risk assessment and management

Cost-Benefit Analysis

- 46 In the *New Zealand Fishing Industry Association Inc v Minister of Fisheries* (CA82/97, 22/7/97) case (known as the ‘Snapper 1’ case), the Court of Appeal wrote “the Minister would be wise to undertake a careful cost/benefit analysis of a reasonable range of options available to him in moving the fishery towards MSY”. Appendix 1 provides a tabular summary of the costs and benefits of each option; the detail of each is provided in following section on way and rate of rebuild.
- 47 Given the lack of quantifiable information available, it is not possible to sum the costs and benefits associated with each option. Neither is it possible to compare the costs against the benefits to determine the superior option.

Way and rate of rebuild

- 48 Section 13 of the Act allows you to rebuild the hoki stock at an appropriate ‘way and rate’. There is no statutory guidance on what an appropriate ‘way and rate’ might be in any given case – it is a matter for you to determine. Stock assessment model projections have been provided for a five year period only with some projections for HOK1 reaching B_{MSY} in that 5-year period and others taking longer. MFish notes you are not required to ensure a rebuild is achieved in this 5-year time frame and a longer rebuild period is available to you.
- 49 According to the model projections, all three management options have the potential to move the HOK1 stock to at or above B_{MSY} within a five year period (although Option 2 achieves the most rapid rebuild). However, none of the options will achieve a full rebuild of the western stock and, as depicted in Table 1 the western stock will continue below B_{MSY} over the next five year period if recruitment continues to be below the long term average.
- 50 To achieve a rebuild of the western stock within five years would require a substantial cut to the TAC or a dramatic shift of effort to the eastern stock. Both actions would likely lead to drastic short term economic consequences and therefore in MFish’s view are unlikely to meet the Purpose of the Act.

Option 1

- 51 Option 1 will effect the slowest rebuild of the western stock but could move the entire hoki stock to the lower end of the recommended B_{MSY} range within five years, to 27-31% B_0 . A faster rebuild of the western stock will take longer than five years unless future recruitment is better than it has been in recent years. In essence, this option prevents the stock biomass from declining further and only a slight rebuild of the western stock can be expected, if below average recruitment continues.
- 52 This option also relies on industry maintaining their commitment to the east: west voluntary

catch split arrangement. Under this option the existing catch split arrangement will remain, with 40% of the TACC being harvested from the western stock and 60% from the eastern stock. Industry will not be required to change existing fishing practices with the exception of abiding by the TAC limits.

- 53 MFish considers this option will result in the fewest socio-economic consequences for industry.

Option 2

- 54 Option 2 is likely to effect the greatest rebuild of the hoki stock over the five year timeframe but even under this management option the western stock will remain below B_{MSY} unless recruitment improves.

- 55 This rebuild will be achieved through a 20,000 tonne TAC (and TACC reduction). The catch split arrangement will remain in place but industry will have to agree that 75% of the TACC will be harvested from the eastern stock

- 56 Reducing the TAC and the TACC by 20,000 tonnes and altering the catch split arrangement so that only 20,000 tonnes can be taken from the western stock is likely to have a significant social and economic impact on the entire deepwater fishing sector, and in particular on those operators that traditionally harvest their hoki ACE from the western stock. This was acknowledged in the submissions received from industry, including from those operators who have publicly supported Option 2.

- 57 Reducing the TACC by 20% will have an immediate impact on economic utilisation in the hoki fishery as export earnings can be expected to mirror the total catch reduction. While it is not possible to estimate by how much export earnings will fall, MFish estimates that based on the average export price from 2006, of \$3.71 per kg, the impact in export earnings could be around \$30m.⁶² There is also the concern that a TACC reduction may impact on overseas supply contracts for other New Zealand species.

- 58 Both Talley's and Vela believe that reducing the TACC by 20,000 tonnes will result in the loss of 1,000-2,000 FTEs from the seafood sector as this option is likely to lead to considerable rationalisation of the number of vessels operating in the fishery, and of processing capability on land.⁶³ This view is supported by Independent who submit that a 20% TACC reduction will cause both significant economic and social hardship as quota owners may be forced to restructure their at sea capability and their onshore value-added facilities.

- 59 Altering the catch split arrangement will also require a significant adjustment in fleet operations amongst the main hoki fishing companies. Reducing effort on the western stock by 50% will mean that those operators that rely on this fishery will be forced to either move their fishing effort to the eastern stock or seek alternative fishing arrangements; given that effort in the eastern stock is already at its limit the latter outcome is more realistic.

⁶² Based on export statistics from 2005 and 2006, a TACC of 100,000 tonnes results in an export volume of approximately 42,000 tonnes (42%). If the TACC is reduced to 80,000 tonnes then MFish estimates that approximately 34,000 tonnes will be exported – a difference of approx. 8,000 tonnes. Using the average export price from 2006, of \$3710 per tonne, this equates to \$29.68m.

⁶³ MFish has no way to verify these claims although total employment in the seafood sector is currently estimated to be 10,000 FTEs. Therefore this would represent a loss of 10 to 20% of total employment.

- 60 The Solander and Aurora Group of Companies submitted that any reduction in effort on the western stock will mean they will be unable to cover their incidental bycatch of hoki from quota management areas (QMAs) 5 and 6. This is because it will be difficult for them to trade their eastern ACE for western ACE since there will be insufficient western ACE available for trading.

Option 3

- 61 Option 3, like Option 1, proposes retaining the TAC and TACC at 101,040 and 100,000 tonnes respectively. MFish considers that maintaining the existing TAC and TACC should move HOK1 towards B_{MSY} while the amended catch spreading arrangements under this option should also increase the rate of rebuild in the western stock (though at a slower rate than Option 2).
- 62 As with all the proposed management options, there is a requirement under Option 3 to manage the catch levels from both the western and eastern stocks. This option proposes altering the catch split arrangement so that less hoki is harvested from the western stock (35,000 tonnes as opposed to 40,000) but more hoki is taken from the eastern stock (65,000 tonnes as opposed to 60,000 tonnes). Industry will be requested to direct this increased effort to the Cook Strait.
- 63 Option 3 is likely to have less economic impact than Option 2, as maintaining a TACC of 100,000 will enable fishers to protect their supply contracts and maintain export revenues at current levels. None of the submissions received on the IPP provided comment on the likely cost and economic implications associated with Option 3. However, some restructuring of fishing operations is likely as companies will have to alter previous fishing patterns to ensure the new catch split arrangement and juvenile hoki protection measures are achieved.

Harvest limits for the eastern and western stock

- 64 For each of the options described above to successfully rebuild HOK1, fishing effort must be divided between the eastern and western stocks, irrespective of whether the TACC is 80,000 or 100,000 tonnes. Under each option most of the fishing effort will occur on the eastern stock, as a reduction in catch from the western stock is necessary to achieve a rebuild.
- 65 However, MFish considers allowing for more than 75,000 tonnes of fish to be harvested annually from the eastern stock may lead to sustainability concerns for this stock over the next five years. In model projections with a catch level of 75,000 tonnes per year from the eastern stock, the biomass of the eastern stock is predicted to fall to 34-40% B_0 over the next 5 years. Any increased catch above this level would deplete the stock below B_{MSY} .
- 66 Increasing the proportion of catch taken from the eastern stock will also lead to increased catches on the Chatham Rise. This increased effort could increase catches of juvenile hoki which in turn may reduce the number of juvenile hoki that migrate to the WCSI to spawn. SeaFIC in their submission, following additional stock assessment analysis by NIWA, note that long-term, increased eastern stock catches could be detrimental to the western stock especially if these increased catches come from the shared juvenile grounds on the Chatham Rise.
- 67 This could be managed by restricting effort on the Chatham Rise and requiring fishers to

increase the proportion of the TACC taken from the eastern spawning grounds including Cook Strait. However increasing effort in the Cook Strait, beyond the levels of effort proposed under Option 2, may increase the effect on fur seal and marine mammal populations. This would also be problematic for vessel operators as there are size limitations on the types of vessels that can successfully operate in Cook Strait and would therefore require some fleet restructuring.

- 68 A substantial reduction in the amount of effort permitted in the western stock fisheries (beyond that proposed in Option 2) will significantly impact on commercial fishing operations in the hoki fishery but will also prevent fishers from harvesting target species in fisheries where hoki is a significant bycatch such as ling (LIN7 and LIN5) and hake (HAK7). The socio-economic implications of this are severe and will impact on company operations, export earnings and on the value of quota in these fisheries.
- 69 For the reasons discussed above MFish recommends that you do not request industry to make any alteration to the voluntary catch split arrangement that would result in more than 75,000 tonnes of the HOK1 TACC being harvested from the eastern stock.

Effect on the aquatic environment

- 70 Environmental NGOs are concerned that the current hoki fishery adversely impacts on seabirds and on the benthic habitat and that for this reason you should consider a lower TAC and TACC.
- 71 Under s 11(1)(a), in varying the TAC, you must take into account any effects of fishing on any stock and the aquatic environment. MFish is aware that the majority of seabird captures in the hoki fishery come from the eastern stocks (Chatham Rise and Cook Strait). Therefore, any increase in effort on the eastern stock could potentially increase the effect on seabird populations.
- 72 MFish considers that the options proposed are unlikely to increase the impact on the aquatic environment from the hoki fishery. While MFish acknowledges the concerns over potential effects on seabird populations and the benthic environment, it is satisfied that existing management measures, such as seabird mitigations devices, offal management and benthic protected areas (BPAs) address many of these concerns. In addition MFish is finalising work on a seabird standard and on a Benthic Impact Strategy which will set out how MFish will manage the effects of fishing on the benthic environment and on seabird populations.
- 73 MFish also notes that there are other tools available under the Act to address the effects of fishing on the aquatic environment that are likely to be more appropriate. In this instance, MFish considers sustainability measures implemented under s 11 and 15 to be more desirable tools than reducing the TAC for HOK1 to effectively mitigate the effects of fishing on seabirds

Integrity of voluntary initiatives

- 74 All three management options rely on industry adherence to a range of voluntary measures including the east: west catch split arrangement. In past fishing seasons MFish has had reason to question the effectiveness of these voluntary measures:
- a) In the last two fishing seasons (before 2006-07) the hoki catch has exceeded the

TACC of 100,000 tonnes; 104,387 tonnes was taken in the 2005-06 fishing season and 104,421 tonnes was taken in the 2004-05 fishing season.

- b) The voluntary east: west catch split - In the 2005-0006 season approximately 46,500 tonnes was removed from the western stock and 45,000 tonnes was removed during the 2004-05 fishing season. Under the catch split arrangement the western stock limit should be 40,000 tonnes.
- c) There are also concerns that the juvenile hoki closed areas and other initiatives to protect juvenile hoki have not been fully respected or appropriately monitored. However, it is difficult to assess the extent to which these initiatives have been breached.

75 Given the issues described above there is cause for concern about relying on voluntary measures to achieve a rebuild in the hoki fishery. However, in recent months both MFish and industry, through the DWG, have worked collaboratively to ensure greater integrity of all management measures in place in the hoki fishery. This has involved implementing the following 'real time' management measures in the winter hoki fishery:

- a) Weekly monitoring of catch levels against the eastern and western stock catch limits and against available ACE
- b) At-sea auditing of the hoki code of practice, vessel management plans and the marine mammal operating procedure by the MFish Observer programme.
- c) Weekly catch sampling of catches from the WCSI so as to profile the length-frequency distribution of hoki taken from the western stock.

76 Although the hoki season is still underway, MFish and the DWG are optimistic that catch levels across the entire hoki stock will remain within the TAC and TACC limit and will reflect the 60:40 east: west catch split arrangement. MFish is also satisfied that, following the observer audits, the majority of vessels are adhering to the voluntary measures to protect seabirds, marine mammals and juvenile hoki.

77 MFish considers that the recent events in the winter hoki fishery indicate that existing voluntary measures have integrity. MFish and the DWG will continue to work collaboratively to ensure the level of management integrity observed in recent months continues throughout the period of the hoki stock rebuild.

78 MFish notes that Forest & Bird and the NZRFC do not support the reliance on voluntary management measures to achieve a stock rebuild. If you are not satisfied that these voluntary measures effectively contribute to the required rebuild of the hoki stock, then you may wish to consider setting other sustainability measures under section 11 of the Act. These measures could include closing the western hoki fishery once the western stock limit has been reached. If you wish to progress such measures, then MFish would be required to prepare initial advice, fully consult with stakeholders on your behalf and provide you with final advice. Such measures would also most likely be implemented by regulation. As a result such measures could not be in place for the commencement of the 1 October 2007 fishing year. Provided the voluntary catch split arrangement continues to have integrity, MFish does not believe this approach is necessary at this time.

Other management issues

- 79 Some of the submissions received from industry proposed additional management measures to support the western stock rebuild. Talley's and Independent both believe that reducing the TAC is only one management tool available to you. They believe there are a suite of tools such as introducing further permanent closures to protect juvenile hoki and increasing the temporary spawning closures in the Cook Strait and on the WCSI which you could consider in place of a more drastic TAC reduction.
- 80 MFish considers there are merits in these proposed measures, but the Act explicitly requires you to set a TAC that rebuilds the stock to a level at or above B_{MSY} . MFish agrees that these additional measures could further support the rebuild in the hoki fishery and is willing to work with industry through the DWG to investigate the merits of these options.

QMA split

- 81 You may also wish to consider in future managing the east: west split through the statutory regime i.e. splitting the HOK1 quota management area (QMA) into two or more quota management system (QMS) stocks. MFish considers this could be a valid option for your consideration in the future but is outside the scope of this current review of HOK1 sustainability measures. Provided the voluntary catch split arrangement continues to have integrity, MFish has no concerns in this respect.

Catch rates in the 2007 winter fishery

- 82 Reports from both industry and the MFish Observer Programme indicate there have been good hoki catches, both in terms of size (average size around 75 cm) and in terms of volume (bags typically greater than 30 tonnes), from the winter hoki fishery on the WCSI in recent months.
- 83 It is unclear what is causing these good catch rates but MFish believes it could be the 2002, 2003 and a portion of the 2004 year classes dominating the spawning biomass. These three year classes, while still below the long term recruitment average, are the strongest year classes seen in the hoki fishery in recent years. They are also a significant improvement on the 1995 – 2001 year classes which were responsible for the poor catches rates and small fish size acknowledged by fishers who fished the WCSI during the last 5 – 7 years.
- 84 MFish is confident that the status of the western hoki stock as described in the 2006-07 stock assessment (and summarised in this paper) remains valid. For this reason, MFish recommends you do not treat the improved catch rates as an indication of a western stock recovery, nor as an indication that the 2006-07 stock assessment misdiagnosed the state of the hoki fishery.

TACC and Allowances

- 85 The TAC must be apportioned between the relevant sectors and interests set out under the provisions of s 20 and 21 of the Act. In varying the TACC, section 21 prescribes that you shall make allowances for Maori customary non-commercial interests, recreational fishing interests, and for any other sources of fishing-related mortality. In determining these allowances, the Minister should consider how the allowances will enable people to provide for their social, economic and cultural wellbeing (as provided for in the Purpose of the Act).

- 86 Recreational and customary fishers do not target hoki as it is predominantly an offshore fishery and there is no data on actual customary and recreational catches of hoki in recent years. However, there are references to customary catches of hoki occurring in the past. MFish also considers it likely a small amount of hoki is caught by recreational fishers while fishing for other middle depth species. An allowance of 20 tonnes each for both recreational and customary fishers is currently provided for and MFish considers these allowances should continue.
- 87 MFish proposes a nominal allowance for other sources of fishing related mortality of an additional 1,000 tonnes for HOK1. This allowance is required to take account of hoki mortality that is not reported such as hoki lost due to net bursts or dumping of damaged hoki.
- 88 This means that under both Option 1 and Option 3 the TACC will be set at 100,000 tonnes. Under Option 2, the TACC will be set at 80,000 tonnes.

Deemed Values

- 89 MFish consulted on amended deemed value rates for hoki as part of the wider deemed value review IPP. Further information on the submissions received and subsequent proposed deemed value rates can be found in the Deemed Value Review FAP that accompanies this paper.
- 90 There were diverging views on where the deemed value rates for hoki should be set for the coming season. Sanford is clear in their submission that they only support a reduction to the hoki TAC if this is matched by an increase to the deemed values rates above the level that was proposed in the deemed value IPP. In summary, MFish is recommending the following deemed value rates for as of 1 October 2007:
- a) Annual deemed value rates set at \$0.90 per kg.
 - b) Interim deemed value rates set at \$0.45 per kg.
 - c) Differential deemed value rates set at \$1.30 per kg and will apply, at the end of the fishing season, to all catch at 102% of ACE holdings.

Future Management

- 91 MFish considers that a rebuild of HOK1 should be based on a coherent long-term management plan rather than implementing annual management measures as part of the sustainability round. This can be achieved through the fishery plan process and MFish and the DWG are working collaboratively on developing a fishery plan for hoki. This plan will build on the initiatives in place for the 2007 winter fishery and will continue to focus on the necessary rebuild of the western stock. The hoki fishery plan should be available for your approval in time for the start of the 2008-09 fishing season.

Compliance Issues

- 92 The proposed management options discussed above are unlikely to result in increased compliance risks in the fishery but continued monitoring of vessel reporting, particularly of

small hoki and bycatch species, is required.

Statutory considerations

- 93 When setting or varying the TAC and TACC under the Act, you are required to consider a series of principles and factors.
- 94 **Section 13 – Total Allowable Catch:** MFish recommends that you consider the TAC under 13(2)(b) to enable HOK1 to be restored to at or above B_{msy} . The specific considerations set out in s13(2)(b) include having regard to the interdependence of stocks, the biological characteristics of the stock and any environmental conditions affecting the stock. The proposed TAC options, and corresponding proposed periods of rebuild, have also taken into account:
- a) The interdependence of stocks for HOK1 (as required by s 13(2)(b)(i)). The HOK 1 fishery entails widespread interactions with other species through bycatch (hake, ling, silver warehou, among others) that are managed through the quota management system. Since none of the options proposed in this IPP will result in an increase in the TACC for hoki, MFish considers the interdependence of stocks are not affected by the management options proposed;
 - b) The biological characteristics of hoki (as required under s 13(2)(b)(ii)). The hoki stock assessment model incorporates current knowledge on the biological characteristics of hoki when determining what levels of TAC and catch splits are acceptable.
 - c) Environmental factors affecting HOK1 such as surface water temperature, and the southern oscillation index, may affect hoki recruitment (as required under s 13(2)(b)(ii)). It is unclear what is the cause of the current low recruitment in the current population. SeaFIC and other submissions suggest it is caused by environmental effects, but MFish considers the best available information on this issue to be indeterminate of such a link.
- 95 **Section 13(4): Social, cultural and economic factors:** You must consider relevant social, economic and cultural factors when assessing the TAC options set out in this IPP. Options 1 and 3 which will retain the TAC and TACC at 101,040 and 100,000 tonnes respectively are likely to provide for greater utilisation and economic benefits. Option 2 will constrain utilisation and reduce revenues from the fishery as it proposes a 20% reduction to the hoki TAC and TACC. Relevant social, economic and cultural factors have been discussed in the section of the paper headed “*Analysis of management options*”.
- 96 **Section 8 – Purpose of the Act:** MFish considers that all options presented in this paper, provide for utilisation in the hoki fishery while ensuring stock sustainability. Each management option proposed contributes to the rebuild of HOKI through a rebuild of the western stock. Option 2 is the more cautious management option and is likely to move HOK1 towards B_{msy} in the shortest period but the lower TAC and TACC proposed under this option will impact on utilisation.
- 97 Retaining the TACC at 100,000 tonnes, under Options 1 and 3, give effect to a slight rebuild but will allow for current levels of utilisation. The proposal to alter the catch split arrangement also under Option 3 will ensure the rebuild occurs at a faster rate than under

Option 1. However, while each management option will effect some improvement to the status of the western stock none will deliver a full rebuild of the western stock in the short-term – this will only be achieved through improved stock recruitment in future years.

98 You must weigh up providing for the utilisation of HOK1 with ensuring its sustainability – however, ensuring sustainability is the bottom line and the ultimate objective. MFish believes that all three options proposed in this paper will ensure sustainability although the rate of rebuild of the stock will vary. In choosing the appropriate management option you must decide if the greater rate of rebuild provided by Option 2 justifies the impact on utilisation that a TAC cut of 20% will produce.

99 **Section 5(a) International and Settlement obligations:** Decision-makers are required to act in a manner consistent with New Zealand’s international obligations relating to fishing, including the Law of the Sea and the Fish Stocks agreement as well as regional fishery management agreements. Decision-makers must also act in a manner consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. MFish considers that the proposed 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.

100 **Section 9 – Environmental principles and section 11(1)(a) – Effects on the aquatic environment:** You must take into account any effects of fishing on any stock and the aquatic environment. You must also take into account the following principles:

- a) Associated or dependent species should be maintained above a level that ensures their long-term viability;
- b) Biological diversity of the aquatic environment should be maintained;
- c) Habitat of particular significance for fisheries management should be protected.

101 The hoki trawl fishery is extensive throughout the exclusive economic zone (EEZ) and the key potential effects of fishing on the environment and marine ecosystem are considered below. MFish considers none of the options proposed are likely to impact on the long-term viability of associated or dependent species, biological diversity of the aquatic environment or on habitats of particular significance for fisheries management.

Seabirds

102 Although trawl vessels operating in the hoki fishery are known to interact with seabirds an accurate estimation of total captures is difficult. This is because observer coverage in the fleet is limited and vessel returns are highly sporadic and often unrepresentative of the fleet. Since the proposed management options will not result in an overall increase in fishing effort they are therefore unlikely to have additional adverse implications for seabirds. However, the bulk of estimated captures come from the Chatham Rise and Cook Strait fisheries and the impact of any move to shift effort from the WCSI to these fisheries, as per Option 3, should be considered. As part of the voluntary management measures in place across the hoki fleet vessels are required to adhere to agreed offal management practices. This is in addition to the regulatory requirements for vessels to use bird mitigation devices. MFish considers this should sufficiently mitigate seabird interactions in the fishery.

Fish bycatch

- 103 The main commercial bycatch species in hoki target fisheries are hake, ling, silver warehou and jack mackerel. None of the management options proposed in this paper recommend an increase in fishing effort although under Option 3 there will be a shift in effort from the western fishing grounds to the eastern grounds. Under Options 1 and 2 the impact on bycatch species from the proposed management measure is likely to be small. Under Option 3 the shift in effort to the eastern stock could result in increased effort in the SWA3 and SWA4 fisheries. However, the proposed options to reduce fishing effort from the western stock (Options 2 and Options 3) will likely result in a reduction in fishing effort in the WCSI ling fishery which has been consistently over caught in the last 10 years.

Marine mammals

- 104 The hoki fishery is responsible for fur seal mortalities particularly in the WCSI fishery (386 fur seals were estimated captured in the 2005-06 fishing season.). None of the options proposed will result in an increase in fishing effort so the adverse effects of hoki trawling on the fur seal population are unlikely to increase. Options 2 and 3 both propose a reduction in fishing effort on the WCSI fishery which may have a positive impact on the number of fur seal interactions in that area. However, information is scarce on the size of the fur seal population that inhabits the WCSI so it is not possible to truly assess the impact from the management options proposed. MFish does note that as part of the voluntary management measures in place across the hoki fleet industry are required to adhere to a range of measures to limit fur seal interactions.

Benthic habitat

- 105 Hoki is a middle depth species and catches from the western stock are predominantly harvested using mid-water trawl gear. However the target hoki fishery on the Chatham Rise is carried out extensively using bottom trawling gear. This activity is likely to result in trawl disturbances which may alter the benthic habitat. None of the management options propose an increase in fishing effort and while Option 3 does recommend that effort is shifted to the eastern stock the focus of this effort should be in the Cook Strait fishery where hoki is harvested using mid-water gear.
- 106 **Section 11(1)(b):** Before varying the HOK1 TAC 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 HOK1 include a restriction on vessels greater in size than 46m fishing up to 5 nautical miles of the coastline.
- 107 **Section 11(1)(c):** Before varying the HOK1 TAC you must take into account the natural variability of the stock. As discussed in the IPP, the hoki fishery is prone to fluctuations in biomass over time due to variable recruitment.
- 108 **Sections 11(2)(a) and 11(2)(b):** Before varying the TAC for HOK1, 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 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 or varying of the TAC for HOK1.

- 109 **Section 11(2)(c):** Before varying the TAC for HOK1, you must have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act that apply to the coastal marine area. Although HOK1 quota management area encompasses the waters of the Hauraki Gulf Marine Park, the distribution of both hoki and its fishery do not intersect with the park boundaries. Therefore there are no relevant considerations under the Hauraki Marine Park Act 2000.
- 110 **Section 11(2A)(a) & (c):** Before varying the TAC for HOK1, you must take into account the effects of 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 HOK1 fishery.
- 111 **Section 11(2A)(b) – Fisheries plans:** Before varying the TAC for HOK1, you must take account of any relevant fisheries plans. There is currently no fisheries plan in place in the hoki fishery. However, work is progressing on developing a fisheries plan for this stock and this is discussed in the IPP in the section on future management.
- 112 **Section 20 and 21** specify a number of matters that must be taken into account when setting or varying a TACC. The allowances for Maori customary non-commercial interests, recreational fishing interests, and for any other sources of fishing-related mortality, before setting the TACC, are discussed in the section under “*TAC allowances*”. As noted, hoki is a predominantly offshore fishery and where there is likely to be little customary and recreational catch. In assessing the proposed allowances and the TACC options, you must consider how the TACC and allowances would enable people to provide for their social, cultural and economic wellbeing. In light of that requirement, MFish is satisfied that the continuation of the small allowance of 20 tonnes each for both recreational and customary fishers and the corresponding proposed TACCs are appropriate.
- 113 **Section 21(4)** requires that any mātaimai reserve or closure/restriction under s 186A to facilitate customary fishing be taken into account. There are mātaimai reserves and s 186A measures in HOK1, but none intersect with the HOK1 fishery. No area has been closed or fishing method restricted (that affects the fishery within HOK1) under the customary fishing provisions of the Act.
- 114 **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 under s 311 have been placed on fishing in any area within HOK1.
- 115 **Section 75 – Minister to set deemed value rates:** New deemed value rates are proposed for the hoki stock for the 2007-08 fishing season. These new rates should ensure that fishers have the necessary incentive to balance all their catch with ACE as per s. 75 (2)(a) of the Act. These considerations are discussed in more detail in relation to HOK1 in the Deemed Value Review FAP that accompanies this paper.
- 116 **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. The Act also requires 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 HOK1 proposals is currently the best available. The management options proposed in this FAP have been developed

based on information from a full hoki stock assessment. Issues surrounding uncertainty of information have been considered as part of the stock assessment process. The model runs used to develop these management options have been based on recent hoki recruitment levels which is a cautious approach, as below average recruitment occurred in the western stock from 1995 to 2003.

Summary of costs and benefits associated with management options for HOK1 for the 2007-08 fishing season

Option 1

Costs	Benefits
<ul style="list-style-type: none"> Less certainty that HOK1 will rebuild in under five years 	<ul style="list-style-type: none"> Current levels of utilisation in the fishery continue – approximately \$156 million export value
<ul style="list-style-type: none"> No rebuild of the western stock over a five year period. 	<ul style="list-style-type: none"> Existing hoki fleet structure can continue

Option 2

Costs	Benefits
<ul style="list-style-type: none"> Potential loss of export earnings in the order of \$30 million. 	<ul style="list-style-type: none"> Lower overall exploitation rate across the stock, means greater certainty that HOK1 is likely to rebuild within the five year period
<ul style="list-style-type: none"> Possible implications on overseas supply contacts for other New Zealand species 	<ul style="list-style-type: none"> Rationalisation in the sector may see the exit of certain operators who have typically operated on the margins, through the use of deemed values, from the fishery.
<ul style="list-style-type: none"> Viability of some of the medium-sized seafood companies is questionable 	<ul style="list-style-type: none"> Possible reduced environmental impacts should effort be reduced
<ul style="list-style-type: none"> Potential loss of 1,000 – 2,000 FTEs (according to some submitters) 	<ul style="list-style-type: none"> Greater rebuild of the western stock is likely.
<ul style="list-style-type: none"> Inability for fishers to source sufficient ACE to cover hoki bycatch when other species are being targeted e.g. ling and hake. 	
<ul style="list-style-type: none"> Possible increased pressure on other deepwater stocks as fishing companies try to shift fishing effort to other fisheries to remain viable. 	
<ul style="list-style-type: none"> Period of rationalisation likely in terms of the number of vessels operating in the fishery and in terms of NZ based processing capability – this could lead to job losses in regional communities. 	

Option 3

Costs	Benefits
<ul style="list-style-type: none"> • Less certainty that HOK1 will rebuild in under five years 	<ul style="list-style-type: none"> • Current levels of utilisation in the fishery continue – approximately \$156 million export value
<ul style="list-style-type: none"> • Some companies who traditionally fish on the western stock will have to alter current fishing operations 	<ul style="list-style-type: none"> • Possible reduced environmental impact in the western fishery if effort is reduced
<ul style="list-style-type: none"> • No rebuild of the western stock over a five year period. 	<ul style="list-style-type: none"> • Existing fleet structure can continue
<ul style="list-style-type: none"> • Possible impact on sea bird populations from increased effort on the eastern stock 	
<ul style="list-style-type: none"> • Possible risk to juvenile hoki if greater effort is applied to the eastern stock 	

OEO (OEO 1) – FINAL ADVICE

Figure 1: Oreo Quota Management Areas



Executive Summary

- 1 This advice paper presents an option to reduce the Total Allowable Catch (TAC) and Total Allowable Commercial Catch (TACC) for OEO 1.
- 2 The Initial Position Paper (IPP) proposed two options: *status quo* (TAC and TACC of 5,033 tonnes) and a reduction of approximately 50% (TAC and TACC of 2,500 tonnes). All submissions, including one representing the owners of 95.95% of OEO 1 quota, supported a reduction of the TAC and TACC.
- 3 The OEO 1 TACC has been well undercaught for the past few years. Although information on stock status and the sustainability of the harvest is uncertain, information based on catch history and current catch levels suggests that the current TAC and TACC is too high.
- 4 The best available information, including the biological characteristics of the species and current catch levels, supports the catch limit reduction option.

The Issue

- 5 Although information on stock status and the sustainability of the harvest is uncertain, if you agree that the sustainability risk that would result from catch at the level of the current TAC and TACC is unacceptably high, then a TAC and TACC reduction is appropriate.

Summary of Options

Initial Proposal

6 The IPP proposed the following options:

- *Option one:* status quo. Retain the current TAC of 5,033 tonnes for the 2007–08 fishing year, and retain the current TACC of 5,033 tonnes and zero allowances for customary, recreational and other fishing related mortality.
- *Option two:* 50% reduction. Reduce the TAC by approximately 50% to 2,500 tonnes effective 1 October 2007, and within that TAC, reduce the TACC to 2,500 tonnes and zero allowances for customary, recreational and other fishing related mortality. A 2,500 TACC is just above the 5-year average catch for OEO 1.

Final Proposal

7 MFish recommends that you:

AGREE TO

a. Reduce the TAC by approximately 50% to 2,500 tonnes;

AND

b. Retain allowances for customary, recreational and other fishing related mortality at zero;

AND

c. Reduce the TACC to 2,500 tonnes.

Consultation

8 The decision on the TAC is made under section 13 of the Fisheries Act and the TACC under section 20. 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. This is consistent with the obligations under s 12.

Submissions Received

9 Submissions regarding this proposal were received from:

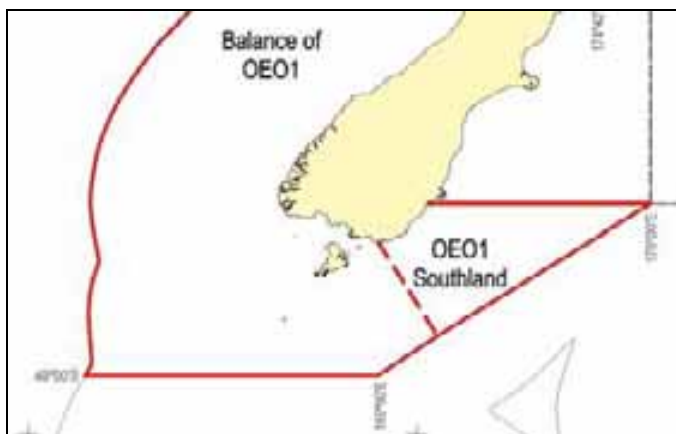
- Deepwater Group Limited (**DWG**)
- Environment and Conservation Organisation of NZ Inc. (**ECO**)
- New Zealand Recreational Fishing Council (**RFC**)
- Royal Forest and Bird Protection Society of New Zealand Inc. (**RF&B**)

- Sanford Limited (**Sanford**)
- The New Zealand Seafood Industry Council Ltd. (**SeaFIC**)

10 All submissions supported Option 2, except the ECO submission. Shareholders owning 95.95% of OEO 1 quota unanimously support a TACC cut of 50%. ECO supported a 1 000 tonne TACC. RFC did not specify which option it supported, although it did state a preference for stronger measures than proposed by the IPP.

Rationale for Management Options

- 11 Commercial fisheries occur for black oreo (BOE) and smooth oreo (SSO). Oreos are managed as a species group, which includes spiky oreo (SOR) and warty oreo (WOE). The Chatham Rise (OEO 3A and OEO 4) is the main fishing area, but other fisheries occur the Bounty/Pukaki area (OEO 6) and in OEO 1. The main OEO 1 fisheries are Southland on the east coast of the South Island (with very small catches from OEO3A) and in the Puysegur-Snares-Macquarie Ridge area south of the South Island.
- 12 OEO 1 quota owners voluntarily restrict smooth oreo catches from the Southland fishery to 400 t. When the limit is reached, the Deepwater Group Limited requests that operators cease fishing oreo in that area.



13 Biological characteristics of oreo include:

	Smooth oreo	Black oreo
Maximum estimated age	86 years	153 years
Estimate age at maturity for females	31 years	27 years
Yields relative to stock size	Likely to be low because of low productivity of oreos	

14 These characteristics are similar to those of orange roughy, another slow-growing, low productivity fish. Because of their characteristics, sustainable yields from oreos are estimated to be low, and it is easy to overestimate the unfished biomass. It is difficult to accurately specify a time stream of future catches and catch limits that will result in an orderly fishing-down phase to achieve target biomass.

- 15 For Southland smooth oreo, quantitative biomass estimates are uncertain, and not considered suitable as a basis for providing management advice. The analysis from 2004 suggests that the mature virgin biomass was probably small, less than 21,000 t, and that the stock was unlikely to be able to support a large fishery.
- 16 For OEO 1 black and smooth oreo, it is not known if recent catch level or the current TACC are sustainable, or will allow the stock to move towards a size that will support the Maximum Sustainable Yield (MSY).
- 17 Over the past five years, the OEO 1 TACC has been well undercaught, and catches have been declining each year:

Year	Catch	% Caught
2001/02	4,197	83%
2002/03	3,034	60%
2003/04	1,703	34%
2004/05	1,025	20%
2005/06	850	17%

- 18 The catch has been steadily declining for a variety of possible reasons, including:
- a) Reduced abundance of oreos.
 - b) Industry ceasing to fish when the smooth oreo limit is reached in Southland. Since the majority of catch comes from Southland (in the order of 70% in recent years), when this limit is reached, there are few other economically viable fishing grounds to target.
 - c) Greater fishing effort is not financially viable. There has been a steady decline in the number of vessels engaged in the OEO 1 fishery.
 - d) Closure of Puysegur. When it was open, Puysegur contributed a substantial portion of the OEO 1 catch. Industry agreed to cease fishing oreo in Puysegur from 1 October 1998, as a part of the industry closure of orange roughy in the Puysegur area. However, the limit for OEO 1 was not significantly reduced to account for the removal of effort from Puysegur (the TACC was reduced from 6,044 t in 1997/98 to the current level of 5,033 t in 1998/99).
 - e) Closure of ORH 7A in 2000/01. From 1977 through to 2000, oreo was a bycatch of the orange roughy target fishery in ORH 7A.⁶⁴ For 2000 to 2003, there was no oreo catch in ORH 7A.⁶⁵ The limit for OEO 1 was not reduced to account for the removal of effort from the ORH 7A fishery.
- 19 There is no reason to believe that the decrease in catch is a result of non-compliance (non-reporting). There are no particular compliance concerns with this fishery.

⁶⁴ New Zealand Fisheries Assessment Report 2002/40

⁶⁵ New Zealand Fisheries Assessment Report 2005/48

Assessment of Management Options

TAC and TACC

- 20 Although there are a number of reasons for declining catch, given the biological characteristics of the stock, there is cause for concern. MFish recommends that you set a TAC under s 13(2)(a), to maintain the stock at or above a level that can produce the maximum sustainable yield. Since the catches are currently well under the limit, there would be greater stock sustainability risk – that the catch would not maintain the stock at B_{MSY} – if catches reached the TACC. That is, given the decline in catches, there is risk that the TAC as currently set will not maintain the stock at or above B_{MSY} .
- 21 MFish considers that the limited information, current levels of catch, and the biological characteristics of the species, together suggest that a cautious approach to catch limits is appropriate. The inherent difficulties in information gathering for oreos, coupled with the relatively small biomass and fishery for OEO 1, mean that more information or more certain information is unlikely in the short-term.
- 22 If you consider that the sustainability risk that would result from catch at the level of the current TACC is unacceptably high, then a reduction in the TACC is warranted.
- 23 If you choose to reduce the TAC, then you will also need to reduce the TACC. When varying the TACC you must allow for non-commercial fishing interests in the stock such as customary, recreational and other fishing related mortality. As OEO is a deepwater species there are no known customary or recreational interests; therefore MFish recommends providing no allowance for these interests. No allowance has been made in the past for fishing related mortality, and MFish does not propose a shift from this position at the current time. Therefore if you reduce the TAC, MFish recommends varying the TACC by the same amount.
- 24 A reduction in the TACC by 50% will provide greater certainty over the longer term that OEO 1 will be managed at or above B_{MSY} , in light of the uncertainties in the best available information, including uncertain stock information. It is, however, not possible to ascertain with any certainty the actual or likely effect of the proposed TAC (and TACC) reduction on the biomass and sustainability of OEO 1, and is best characterised as a risk mitigation approach.
- 25 The ECO submission proposes a greater reduction, with a TAC of 1,000 tonnes. This would reduce the catch limit to about the current catch.
- 26 MFish and all submitters agree that a reduction is appropriate. The extent of that reduction should be guided by your view on the relative sustainability benefits and utilisation impacts. In MFish's view, the appropriate step at this point is to remove the headroom (quota in excess of catch), using an average of recent catches to retain some flexibility for operators. To reduce the TAC and TACC to 1,000 tonnes (an 80% reduction) would be a drastic step given the utilisation consequences.
- 27 Reducing a TAC usually affects utilisation by commercial fishers, and would usually lead to reduction in economic wellbeing. However, in this case, the full TACC is not being caught, and the reduction proposed will substantially reduce this 'headroom'. The reduction would have a consequential economic benefit in that the cost recovery levies for non-attributable

costs imposed on OEO 1 quota owners would be reduced. Current cost recovery levies for OEO 1 are approximately \$150,000; a reduced TACC could significantly reduce this cost to OEO 1 quota owners.

- 28 Industry supports a 50% reduction in the TACC for the following reasons:
- a) There is a mismatch between annual catches and the TACC.
 - b) The perceived status of the stock in relation to the TACC.
 - c) A reduction is a reasonable precautionary measure in light of the unavailability of science on which to base catch limits.
 - d) To rationalise costs given that MFish levies are TACC-based and the fishery is realising only a fraction of the TACC.
- 29 A 50% reduction is appropriate as the economic consequences are negligible, is supported by quota owners, and reflects the declining catch. MFish will continue to monitor this stock, and will advise you if future adjustments are required. Based on best available information, MFish recommends Option 2

Other Management Issues

- 30 The ECO and RF&B submissions recommended that OEO 1 be split into smooth and black oreos, and that OEO 1 be split into a northern and southern area. While subdividing a QMA into multiple QMAs and dividing a multi-species stock into multiple stocks are permitted under the Act, it must be done either at the request of quota owners holding 75% of the stock, or if the Minister is satisfied that the alteration “is necessary to ensure sustainability”. No such request has been made by quota owners, and no analysis has been done on whether that particular management response would be ‘necessary’.
- 31 The IPP consultation related only to a possible TAC and TACC reduction, not on a revised approach for the management of oreos. Any alteration of QMAs requires a separate analysis, input and participation of tangata whenua, and a s 12 consultation.
- 32 MFish acknowledges that ECO and RF&B have consistently proposed a species and/or QMA split for oreos, most recently as part of their submission for the October 2003 sustainability round for OEO 4. At the time, MFish responded that in the absence of a fishery plan “MFish recommends that [the Minister] pursue a legislative catch split or other appropriate measures as necessary to manage black and smooth oreo”. The Plenary agrees that the three oreo species could be managed separately. MFish still considers that the broader issue of the most appropriate future management approach is best addressed through a fisheries plan; should this not eventuate, then other measures such as a species or QMA split could be considered.

Appendix 1: Statutory Considerations

Purpose of the Act: section 8

- 33 Under the purpose of the Act, you must provide for the utilisation of oreo while ensuring sustainability. Ensuring sustainability is ultimate objective. There are sustainability concerns with the current TAC and TACC for OEO 1. Option 2 provides a more cautious approach than the *status quo*. Based on the best available information, this option increases the likelihood that the harvest will be sustainable over the long term. However, there remains a high degree of uncertainty about the level at which harvest of the stock is sustainable.
- 34 “Utilisation” means conserving, using, enhancing and developing fisheries resources to enable people to provide for their social, economic and cultural wellbeing. There are no known adverse economic consequences of a TAC reduction under option 2, and there would be some consequential cost savings from reduced cost recovery levies. There is no known recreational or customary fishing for oreo, and therefore no allowance has been provided. There is a broad social benefit from the maintenance of oreo populations, which is promoted through a sustainable fishery. There are no known cultural factors relevant to sustainability or management decisions.

International obligations and the Treaty of Waitangi: section 5

- 35 Section 5 of the Act requires you to act in a manner consistent with New Zealand’s international obligations relating to fishing; and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. Relevant international obligations include the United Nations Convention on the Law of the Sea and the United Nations Fish Stocks Agreement as well as regional fishery management agreements. MFish considers that in making the proposed reduction to the TAC and TACC you would be acting consistently with section 5.

Environmental principles: section 9

- 36 Section 9 requires you to take into account the following environmental principles when making his decisions on whether to vary the TAC and the TACC: (a) Associated or dependent species should be maintained above a level that ensures their long-term viability; (b) Biological diversity of the aquatic environment should be maintained; (c) Habitat of particular significance for fisheries management should be protected.
- 37 The specific nature and extent of the effects of OEO 1 fishing are not known. No specific concerns have been raised relating to ss 9(a) and (b) that would be relevant to setting the TAC or TACC for OEO 1. MFish is not currently aware of any habitat of particular significance for fisheries management that should be protected in the area in which OEO1 stock are present (s 9(c)).

Information principles: section 10

- 38 Section 10 of the Act sets out information principles you must follow when making his decisions on varying the TAC and TACC. MFish considers that the information used to support the proposed options for OEO 1 is the best available (s 10(a)). MFish is not aware

of any other information that could be made available without unreasonable cost, effort, or time. Given the level of uncertainty, as outlined in the body of this FAP, you should be cautious (ss 10(b) and (c)). This uncertainty has not been used as a reason for postponing or taking any measure to achieve the purpose of the Act. Therefore, this FAP considers whether a TAC and TACC reduction is required and what the appropriate level of reduction may be (s 10(d)).

Effects on the aquatic environment: section 11(1)(a)

39 Section 11(1)(a) requires you to take into account any effects of fishing on any stock and the aquatic environment when setting or varying any sustainability measure. Information relating to the effects on the aquatic environment is provided above in the section addressing the environmental principles. As orange roughy is commonly intermixed with oreo, MFish would be concerned about the potential increase in orange roughy catch should the OEO 1 TAC and TACC be unchanged. MFish has considered the effects of the OEO 1 options on fish bycatch, benthic effects, seabirds and marine mammals. The proposed options are not likely to have any adverse implications for any of these elements of the aquatic environment.

Existing controls that apply to the stock: section 11(1)(b)

40 Section 11(1)(b) requires you to take into account any existing controls under the Act that apply to the stock or area concerned when setting or varying any sustainability measure. There is currently a TAC and TACC set for the stock there are no other controls on the stock imposed under the Act.

Natural variability of the stock: section 11(1)(c)

41 Section 11(1)(c) requires you to take into account the natural variability of the stock concerned when setting or varying any sustainability measure. Best available information is that oreo are not highly variable.

Resource Management Act 1991: section 11(2)(a)

42 Section 11(2)(a) requires you to have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, when setting or varying any sustainability measure. MFish is not aware of any relevant considerations under any of these instruments that apply to the variation of a TAC for OEO 1.

Conservation Act 1987: section 11(2)(b)

43 Section 11(2)(b) requires you to have regard to any provisions of any management strategy or management plan made under the Conservation Act 1987 that apply to the coastal marine area and are considered by you to be relevant. MFish is not aware of any relevant considerations relating to any provisions of any management strategy or management plan made under the Conservation Act 1987.

Hauraki Gulf Marine Park Act 2000: section 11(2)(c)

- 44 Section 11(2)(c) requires you to have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000. Although the OEO 1 quota management area encompasses the waters of the Hauraki Gulf Marine Park, the distribution of oreo and the fishery for it do not intersect with the Park boundaries. MFish considers that there are no relevant concerns regarding sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000.

Conservation or fisheries services and fisheries plans: section 11(2A)

- 45 Section 11(2A)(a) to (c) requires you to take into account any conservation services or fisheries services and any relevant approved fisheries plan; and any decisions not to require conservation services or fisheries services. MFish does not consider that existing or proposed conservation or fisheries services materially affect the proposed TAC options. There is no approved fisheries plan for OEO 1.

Interdependence of stocks: section 13(2)

- 46 Section 13(2) requires that you set the TAC having regard to the interdependence of stocks. Available information about the interdependence of stocks is highly uncertain, and there is no evidence to suggest that this consideration should affect any option.

Social, cultural and economic factors: section 13(3)

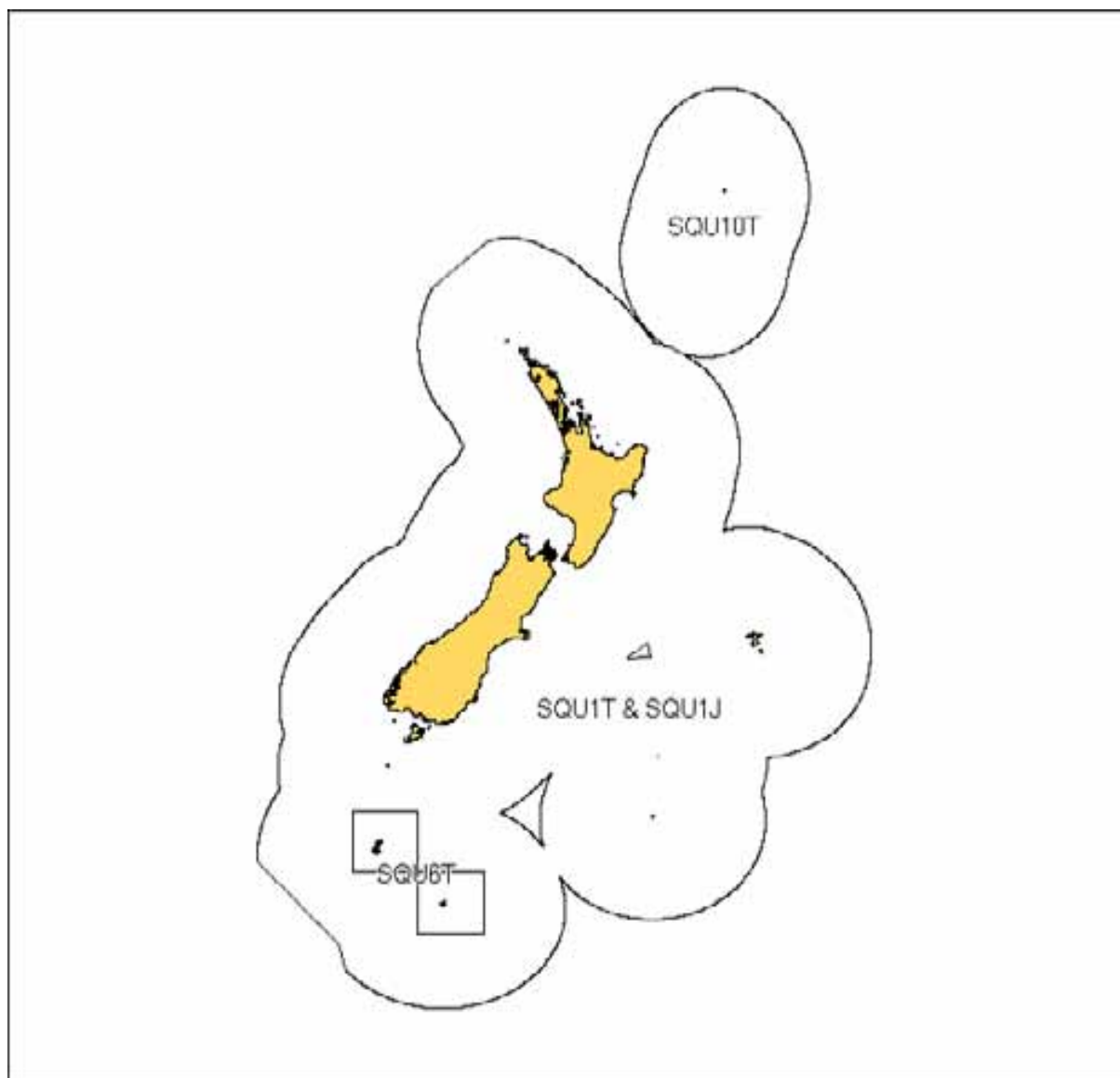
- 47 In determining the way in which and rate at which a stock that is currently below or above B_{MSY} is moved towards B_{MSY} , section 13(3) requires you to have regard to social, cultural, and economic factors you consider relevant. Your decision for OEO 1 is whether the current TAC (if caught) is set at a level that will maintain the stock at or above B_{MSY} . Based on available information, MFish does not consider the stock to be below B_{MSY} .

Matters to be taken into account in varying any total allowable commercial catch: section 21(1)

- 48 Under section 21(1), in varying any TACC you shall have regard to the TACC for that stock and shall allow for Maori customary non-commercial fishing interests, recreational interests and all other mortality to that stock caused by fishing. Section 21(4) requires the Minister to take into account any mātaihai reserve in the relevant quota management area, any area closure or any fishing method restriction or prohibition in the relevant quota management area that is imposed by the Minister under section 186A. Section 21(5) requires the Minister to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made following a recommendation made by the Minister under section 311.
- 49 There is no known non-commercial fishing for OEO 1, and therefore no allowance is made for recreational or customary fishers. Other sources of fishing-related mortality have been considered when setting the TACC. There are no relevant mātaihai reserves, or closures under section 186, or regulations made under section 311.

SQUID (SQU 1T) - FINAL ADVICE

- 1 This paper provides MFish final advice on management measures for the SQU1T fishery for 2007-08.



Executive summary

- 1 SQU1T is managed under section 14 of the Fisheries Act 1996 (the Act) which means the total allowable catch for the stock is set without reference to maximum sustainable yield (MSY). Squid is also listed on the Third Schedule of the Act which permits fishers to seek an in-season total allowable catch (TAC) increase from the Minister of Fisheries.
- 2 Some industry quota owners have recently requested a permanent increase of 30% to the SQU1T total allowable commercial catch (TACC) so as to remove the effort and uncertainty they consider is associated with seeking an annual in-season increase. Following this request MFish consulted on three options for the TAC and TACC ranging from the

status quo of 44, 740.88 tonnes (Option 1) to increasing the TAC and TACC by 20% to 53,689.06 tonnes (Option 2) and by 30% to 58,183.14 tonnes(Option 3).

- 3 All submissions received, including those from quota owners who had made the request, support retaining the existing TAC and TACC (Option 1). This is also the MFish preferred option. Consideration of an increase should occur within a fisheries plan for squid.
- 4 You are still permitted to increase the TAC and TACC if you consider it appropriate to do so at this time. However in doing so you must be satisfied that any increase in fishing effort associated with a TAC and TACC increase will better meet the Purpose of the Act and will not have an adverse effect on seabirds, marine mammals and finfish bycatch associated with the SQUIT fishery.
- 5 MFish believes that existing management measures, particularly with regard to seabird bycatch would sufficiently mitigate any adverse effects on the aquatic environment that may arise following a SQUIT TAC and TACC increase.

Consultation

- 6 Your decision whether or not to adjust the TAC/TACC for SQUIT is a decision under sections 14 and 21 of the Act and therefore the consultation requirements of sections 12 and 21(2) apply.
- 7 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.
- 8 MFish posted all IPPs on the MFish website, and notified stakeholders by letter, which was sent to approximately 350 companies, organisations and individuals.

Submissions received

- 9 Submissions were received from the following:
 - a) Deepwater Group Ltd.
 - b) Environment and Conservation Organisations of NZ Inc
 - c) Independent Fisheries Ltd
 - d) New Zealand Recreational Fishing Council
 - e) Sanford Ltd
 - f) Seafood Industry Council Ltd
 - g) Sea Resources Company Ltd
 - h) Solander and Aurora Group of Companies

- 10 A summary of submissions and copies of the submissions in full are included in Volume 2.
- 11 All submissions received support retaining the existing TAC and TACC of 44,740.88 tonnes. Those industry members that had requested a permanent increase to the TACC now believe it should be deferred for a year for consideration as part of the squid fisheries plan along with the following additional management issues:
- a) Possible amalgamation of the SQUIT and SQUIJ fisheries.
 - b) Requirement for further research on the biology of the two key squid species, *Nototodarus gouldi* and *Nototodarus sloanii*, and consideration of the different fisheries management needs of these two species.
- 12 Submissions from environmental NGOs and non-commercial fishers also support leaving the TAC and TACC unchanged.

Summary of options

Initial and Final Proposal

- 13 The options are unchanged from the IPP. MFish recommends that you:

EITHER

- a) AGREE to retain the existing TAC and TACC of 44,740.88 tonnes. Quota owners can still request an in-season increase to the TAC and TACC. This option reflects the status quo. Provide an allowance of zero for non-commercial use and for other sources of fishing related mortality (MFish recommended option);

OR

- b) AGREE to increase the TAC and TACC for SQUIT by 20%, from 44,740.88 tonnes to 53,689 tonnes. This option reflects the in-season increases provided to quota owners in recent fishing seasons. Provide an allowance of zero for non-commercial use and for other sources of fishing related mortality;

OR

- c) AGREE to increase the TAC and TACC by 30%, from 44,740.88 tonnes to 58,163.15 tonnes, as requested by commercial stakeholders. Provide an allowance of zero for non-commercial use and for other sources of fishing related mortality

- 14 However you are not limited to the options detailed above and you are permitted to set the SQUIT TAC and TACC at any level that you consider best meets your obligations under the Act.

Background

- 15 SQUIT is managed under section 14 of the Act which means the TAC for the stock can be set without reference to MSY. In order to set the TAC without reference to MSY, you must be satisfied that the purpose of the Act will be better achieved by setting a TAC otherwise

than in accordance with s 13(2). Because of the short life span, rapid growth and high variability of the squid stock, it is not possible to estimate the squid biomass prior to the fishing season, and therefore it is appropriate to set the TAC without reference to MSY. The SQUIT fishery has been managed without reference to MSY in the past, and MFish sees no reason to depart from this.

- 16 Squid is also listed on the Third Schedule of the Act which permits fishers to seek an in-season TAC increase from the Minister of Fisheries. The additional ACE associated with such a TAC increase is allocated to commercial fishers.
- 17 An in-season increase was sought by and awarded to quota owners in the 2002-03 and 2005-06 fishing seasons. It was also sought and declined in 2004-05 due to concerns that fishing activity in the SQUIT fishery was adversely affecting the seabird population. An in-season increase was not sought for the current fishing season. MFish believes this was due to low commodity prices, which would suggest that quota owners believed there were more profitable ways to deploy the deepwater fleet other than harvesting additional squid.
- 18 On each occasion when an in-season increase was approved, the TAC increased by 20% for the remainder of that fishing season. At the start of the following fishing season the TAC reverted back to its pre-existing level.
- 19 An important issue in the squid trawl fishery is the interaction between squid trawling and seabirds. Seabirds feeding on discards or offal behind the stern of the vessel are vulnerable to being struck by the trawl warps. Seabirds, particularly small birds such as petrels, can also get entangled in nets during their setting and hauling.

Rationale for management intervention

- 20 MFish initially considered options for a SQUIT TAC and TACC increase for two reasons. First, some industry members have expressed concern that the existing process for seeking an in-season increase takes too long and often the increase decision is received too late in the season to be of any real benefit. They believe that increasing the TAC permanently would overcome this problem.
- 21 Second, acting on stakeholders' request for an in-season increase is time-consuming and directs Ministry resources away from other fisheries management issues. Given that in the majority of past season requests have been approved, MFish does not consider this is the most effective use of resources.
- 22 However, it is apparent from the submissions received following consultation of the IPP that stakeholders do not support increasing the TAC and TACC.

Analysis of management options

- 23 All submissions support the TAC and TACC remaining unchanged at 44,740.88 tonnes. While all management options proposed in the IPP continue to have merit and remain relevant for your consideration, MFish recommends that you agree to Option 1 and retain the existing SQUIT TAC and TACC.
- 24 However, you have the option to increase the TAC and TACC if you consider it

appropriate. In addition to providing an option on the status quo (Option 1), MFish also provided two options for increasing the TAC and TACC, by 20% (Option 2) and by 30% (Option 3).

Option 1: Status Quo

- 25 Option 1 will retain the existing TAC and TACC of 44,740.88 tonnes. This will require stakeholders to seek an in-season TAC increase if squid are abundant during the coming season and the TACC is limiting utilisation. It is apparent from submissions that commercial stakeholders are satisfied with this approach.
- 26 MFish does not consider there will be any new stock sustainability concerns or adverse environmental effects arising from retaining the status quo. Submissions from environmental NGOs and non-commercial fishers also support leaving the TAC and TACC unchanged.

Option 2: TAC and TACC increase of 20%

- 27 Option 2 provides for a TAC and TACC increase but recommends an increase in line with the 20% increase that has been given in previous in-season increases. Under this option the TACC would increase from 44,740.88 tonnes to 53,689 tonnes. Increasing the TACC by this amount may increase seabird and marine mammal interactions and in choosing this option you must be confident that mitigation measures are sufficient to limit the risk of adverse effects arising from these interactions.

Option 3: TAC and TACC increase of 30%

- 28 This option proposes to increase the TAC and TACC by 30% from 44,740.88 tonnes to 58,163 tonnes. This is the management option originally requested by some members of industry. Increasing the TACC to this level is likely to have the greatest impact on the fishery particularly in terms of impact on seabird and marine mammal populations and the sustainability of bycatch stocks. In choosing this option you must be confident that mitigation measures are sufficient to limit the risk of adverse effects arising from these interactions.

Legislative framework

- 29 In setting the SQUIT TAC under s. 14, you must take into account any effects of fishing on any stock and the aquatic environment (s11(1)(a)). 'Aquatic environment' is defined as including all aquatic life, which is in turn defined as any species that inhabits water including seabirds. Part II of the Act (sections 8 – 10) states that part of 'ensuring sustainability' is (s. 8) avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment. Section 9(a) requires that you take into account, when acting under the authority of the Act, the principle that associated or dependent species should be maintained above a level that ensures their long-term viability. Section 9(b) requires that the biological diversity of the aquatic environment should be maintained. Therefore there is a requirement for you to take into account the effects a TAC may have on the aquatic environment and in the SQUIT case, in particular on finfish bycatch, marine mammals, and seabirds.
- 30 Section 15 relates to fishing-related mortality of marine mammals or other wildlife, and

provides you with tools to actively manage the effects of fishing on any protected species. Section 15 provides that such measures can be implemented by regulation under s. 298 or by Gazette where a population management plan or limit on fishing-related mortality exists. Section 11 also provides for the implementation of measures by regulation or Gazette to address sustainability issues. This has been used previously to regulate the requirement to deploy bird mitigation devices in trawl fisheries under section 11, and to manage the sea lion interaction in the 6T fishery under section 15.

- 31 Under section 14, the TAC is set with reference to the purpose of the Act. The purpose of the Act (in terms of the definition of ensuring sustainability) imparts an obligation on decision makers to avoid, remedy and mitigate any adverse effects of fishing on the aquatic environment. Therefore, this FAP presents the relevant information on this issue so that you can take into account the effects of the proposed TAC options on seabirds, marine mammals and finfish bycatch (as required by s. 11(1)(a)).
- 32 However, if you consider the effects can be more appropriately addressed through other sustainability measures, then MFish recommends that you consider the adoption of such measures under s. 11 or 15 to actively manage the effect of fishing on a protected species like seabirds and marine mammals (as has been done in the past). Although effects on the aquatic environment must be taken into account when determining the TAC, MFish is of the view that you should consider if sustainability measures other than the TAC are best placed (most effective, fewest negative economic consequences) to mitigate the problem.
- 33 In setting the TACC under s. 21 you must allow for Maori customary non-commercial fishing interests, recreational interests and all other fishing related mortality to the stock.

Risk assessment and mitigation

- 34 The biological characteristics of the squid stock mean that a permanent increase to the TAC is unlikely to have any adverse effect on the sustainability of the squid stock but it may result in an increase in fishing effort in the fishery. It is this potential increase in fishing effort and the impact that it may have on seabirds, marine mammals and bycatch stocks to which you must give due consideration.
- 35 The impact of a possible TAC and TACC increase on the following is discussed below:
- a) The SQUIT stock
 - b) Finfish bycatch
 - c) Seabirds
 - d) Marine mammals.

Impact of a TAC and TACC increase on the SQUIT stock

- 36 In previous fishing seasons, an in-season TAC increase has only been requested when there is high squid abundance. It is unclear what effect a higher TACC will have on the fishery in seasons when abundance is either at or below average, but MFish considers it is likely to have minimal effect given that squid are only fished if they are present and are economically viable to fish. When squid abundance is poor the season finishes early and the

squid fleet traditionally moves into the jack mackerel fishery before the start of the hoki season. MFish considers that in years of poor abundance the increased TACC is unlikely to have any adverse effects on the sustainability of the SQUIT stock or on the aquatic environment.

- 37 Therefore, any adverse effects from an increase to the SQUIT TACC would most likely occur when squid abundance is high, resulting in an increase in fishing effort so that the full TACC can be harvested. This increase in effort is likely to come from existing vessels undertaking more tows rather than new vessels entering the fishery. Vessels operating in SQUIT form part of the deepwater fleet which fishes all the main deepwater stocks as part of their annual catch plans. It is unlikely to be cost effective for operators to bring in additional vessels to the SQUIT fishery in years when abundance is good since it is unclear what these vessels would do before or after the squid season.
- 38 There is also the potential risk that fishing effort might increase to match the higher TACC if squid prices increase or if effort is reduced in other fisheries because of sustainability concerns. As noted above, MFish considers levels of effort in the squid fishery are determined by abundance of the squid stock in the first instance. If squid are commanding a good price and if abundance is good then effort can be expected to increase but this will likely reduce effort in other deepwater fisheries such as SQU6T as vessels remain longer in the SQUIT fishery. Effort is unlikely to increase if the value of squid increases without a rise in abundance as the squid will not be present in the fishery. MFish does note that effort can be reduced even in years of good abundance if market prices are low – as evidenced in the 2006-07 fishing season.
- 39 While a TACC increase may give flexibility to vessel operators to determine if it is more profitable to remain in the squid fishery, to choose between fishing in 1T and 6T, or to shift to other deepwater or middle-depth stocks, it is unlikely to result in significant utilisation gains above those which are already available through the annual in-season increase. However, it would reduce the potential for an annual transaction cost associated with the in-season request.

Finfish bycatch

- 40 An increase in fishing effort could also increase catch levels of the key bycatch stocks, particularly barracouta, silver warehou and jack mackerel. MFish observer data indicates that squid typically accounts for 67% of the total catch in the SQUIT target fishery.
- 41 MFish is particularly concerned that increasing the SQUIT TACC will impact on silver warehou stocks in those years when the full SQUIT TACC is taken; particularly in the SWA3 and SWA4 fisheries as these fish stocks overlap the key fishing areas in the SQUIT fishery. Landings in both stocks have been in excess of the TACC in recent years.
- 42 The current status of the SWA3 and SWA4 stocks is unknown, so it is not possible to determine the extent of a sustainability risk arising from increased catch levels in the absence of an updated silver warehou stock assessment. However, MFish believes that a high proportion of the excess catch is due to fishers deliberately targeting SWA rather than it being taken as a bycatch in the squid fishery. This is largely due to the absence of effective deemed value rates in both the SWA3 and SWA4 fisheries. Fishers are choosing to deliberately target SWA3 and SWA4 because they can pay the deemed value rate and still generate a profit.

43 MFish is reviewing the deemed value rates of these stocks as part of the wider deemed value review process. If you choose to increase the deemed value rates for silver warehou for the coming season MFish considers this should reduce the existing pressure on the SWA3 and SWA4 stocks, by reducing the incentive to target these species. This would mean that any increase in effort in SQUIT would have less of an impact on these bycatch stocks.

Seabirds

44 An important issue in the squid trawl fishery is the interaction between squid trawling and seabirds. The SQUIT fishery historically has the highest recorded seabird bycatch mortalities in New Zealand fisheries. Squid target fishing in the Stewart-Snares shelf area (part of SQUIT) has had either the highest or second highest seabird bycatch rates from 2001-02 to 2004-05. Table 1 below details the estimated seabird capture levels at the fleet level in the SQUIT fishery in recent years.

Table 1: Details of estimated seabird captures from the SQUIT fishery by area, 2003-04 and 2004-05

2003-04	Area				
	Chatham Rise	Pukaki rise	Puysegur	Snares/Stewart Shelf	SQU6T
Number of tows	584	330	251	4534	2596
% observed	<1	5	0	21	31
Estimated no. seabirds caught	-	19	-	502	325
CV of estimate (%)	-	93.4	-	17.5	16.3
2004-05	Area				
	Chatham Rise	Pukaki rise	Puysegur	Snares/Stewart Shelf	SQU6T
Number of tows	1515	67	292	5861	2693
% observed	4	2	22	27	30
Estimated no. seabirds caught	-	-	33	877	414
CV of estimate (%)	-	-	36	12.1	14.9

Source: 'Incidental capture of seabird species in commercial fisheries in New Zealand waters, 2003-04 and 2004-05'. S. J. Baird and M.H. Smith. New Zealand Aquatic Environment and Biodiversity report No. 9 2007.

45 Between 2003-04 and 2004-05 there was a statistically significant increase in seabird captures in the SQUIT fishery from 521 captures to 910 – although fishing effort also increased during this period (Table 1). The figures from the 2004-05 period also correspond with the launch of the national plan of action on seabirds (NPOA) which MFish would have expected to have led to some reduction in the number of seabird captures, as vessel operators should have implemented a range of voluntary mitigation measures. However, MFish does acknowledge that it may not have been realistic to expect immediate changes in such a short time period.

46 There is also some concern that landed seabird captures (which form the basis of figures in Table 1 above) are only a proportion of total seabird mortalities and if non-landed mortalities were included, the estimates would increase substantially. The extent of net-caught seabird captures is also unknown. Information on the extent of net captures is incomplete as not all net captured seabirds are recovered from the vessel but the recent mitigation device trials in the 2005-06 season estimate that over half of all small seabird captures occurred in the net.⁶⁶ MFish is currently investigating the effect mitigation measures may have on levels of net captures.

⁶⁶ “A fleet scale experimental comparison of devices used for reducing the incidental capture of seabirds in trawl warps.” E.R. Abraham, D.A.J. Middleton, S.M. Waugh, J.P.Pierre, N. Walker, C, Schroder. 2007

- 47 MFish notes that seabird captures from 2003-04 and 2004-05 predate the implementation of regulatory bird mitigation devices and recent voluntary initiatives by industry.
- 48 Regulatory measures have been in place since 2006 and require all vessels operating in the squid trawl fishery to deploy approved bird mitigation devices (streamer (tori) lines, warp scarers or bafflers). These devices are meant to keep birds away from the trawl warps, particularly during net hauling. MFish observers have been monitoring whether these mitigation devices are being deployed correctly. MFish fishery officers have also been undertaking routine inspections of vessels to ensure they are carrying the appropriate mitigation devices and to date compliance with these measures has been good.
- 49 In 2006 MFish contracted a research project to investigate the performance of the three mitigation devices in reducing seabird interaction in the squid trawl fishery.⁶⁷ The study used observer data from 18 vessels operating in the squid trawl fishery (SQU6T and SQU1T). Results indicate that tori lines reduced the warp strike rates for large birds and small birds to 11% and 17.6% of the rate that would have occurred in the absence of mitigation measures. This research was carried out on a large sample of the squid trawl fleet during normal operations and MFish considers the results reflect general operational practice in the fishery.
- 50 The study did show that seabirds can also interact with the mitigation devices and that incidences of seabirds striking tori lines were not uncommon, although no captures were recorded following these interactions. However, MFish has only anecdotal information on the severity of tori line strikes at this time but this anecdotal evidence suggest it may be problematic.
- 51 In addition to these regulatory measures, industry has also introduced a series of voluntary measures to help reduce seabird capture and mortality levels. These voluntary measures focus particularly on offal management as the discharge of offal is a major attraction to seabirds and is linked to mortalities and captures.
- 52 In the 2006-07 fishing season the Deepwater Group Ltd (DWG) on behalf of quota owners implemented vessel management plans (VMP) across all vessels operating in the SQU6T fishery. Most of the vessels operating in SQU6T also fish in SQU1T. Each VMP sets out a vessel-specific seabird incidental catch mitigation procedure. These VMPs focus on offal management and detail the appropriate actions that vessel crew should take to manage seabird interaction, such as not discharging offal when hauling gear. As part of this programme each vessel was required to report twice weekly to the DWG, detailing levels of seabird interactions.⁶⁸ MFish observers have had no formal role in assessing whether squid fishers have followed their VMP, although MFish observers will audit VMPs in the squid fishery in the future.
- 53 MFish considers efforts to manage offal discharge are important to mitigate seabird interactions. The research project comparing mitigation devices, described above, showed that “the occurrence of warp strikes was strongly associated with the discharge of fish processing waste’ and that there were few strikes in the absence of discharge”.⁶⁹ Evidence from a recent Falkland Islands trawl study also indicates that preventing the discharge of

⁶⁷ Ibid.

⁶⁸ The DWG are in the process of developing VMPs for the entire deepwater fleet.

⁶⁹ “A fleet scale experimental comparison of devices used for reducing the incidental capture of seabirds in trawl warps.” E.R. Abraham, D.A.J. Middleton, S.M. Waugh, J.P.Pierre, N. Walker, C, Schroder. 2007.

offal or other waste while gear is in the water would almost eliminate the mortality of seabirds on the warp.⁷⁰

- 54 Preliminary figures from a DWG report suggest that seabird captures have declined in the current season in comparison to previous seasons.⁷¹ In summary, this report suggests that the number of seabird captures has been substantially reduced since 2004-05 and that the overall rate of capture has reduced by 60% over the same period. These reductions are attributed to mandatory warp-strike mitigation measures and improved offal management by industry under VMPs. MFish acknowledges that this information is anecdotal but it is currently the only information available for the most recent squid season and is therefore of value. This information will remain anecdotal until data from MFish observers covering the same period is reviewed by the aquatic environment working group (AEWG). Until all information has been reviewed it is premature to make conclusive statements on the extent to which voluntary and regulatory measures are reducing seabird captures rates.
- 55 Therefore the implications of an increase in squid fishing effort on the seabird population is difficult to assess given there have been changes in the way vessels operate since the most recent seabird capture figures were produced. The best available information suggests that levels of incidental mortality of the magnitude experienced in 2003-4 and 2004-5 are likely to be detrimental to some species of seabird, particularly if impacts from other new Zealand fisheries, from overseas fisheries and from non-fishing impacts are taken into account. The considerable effort by both government and industry to manage seabird interactions is promising, even if it is too early to make conclusive statements about their effectiveness.
- 56 Should you approve a TACC increase, you must be satisfied that the measures described above will adequately mitigate the effects of increased fishing effort on seabird populations.
- 57 In the past the possibility of an in-season TAC increase may have encouraged vessel operators to engage in good seabird mitigation practices. With an increase to the baseline TACC, you may no longer be able to use a potential in-season increase to influence voluntary good behaviour. MFish considers the likelihood of industry deliberately choosing to ease back on voluntary measures is very low. MFish believes that the recent improvements made to performance will continue through:
- a) Continued monitoring of vessel use of tori lines and bird bafflers.
 - b) Working with industry, particularly the DWG, to ensure vessel operators are managing seabird bycatch appropriately through regulatory and voluntary initiatives.
 - c) Monitoring of vessel performance against VMPs through:
 - i) The MFish observer programme – Observers auditing vessel performance against VMPs.

⁷⁰ Sullivan, B.J., Reid, T.A. and Bugoni, L. 2006b. Seabird mortality of factory trawlers in the Falkland Islands and beyond, *Biological Conservation*, **131**: 495-504.

⁷¹ On 2 April 2007 DWG advised MFish of levels of seabird interactions in SQU6T. Since many of the vessels operating in SQU6T also operate in 1T this information is relevant.

- ii) A research programme is also underway to assess existing VMPs against best practice mitigation measures to ensure they are the most appropriate way to reduce seabird interaction.
- d) Advising industry that if voluntary initiatives are unsuccessful then appropriate action may be to regulate for the desired behaviour.

Marine mammals

58 The SQUIT fishery also interacts with fur seals and to a lesser extent sea lions. Table 2 shows recent levels of fur seal bycatch in the SQUIT fishery. MFish considers an increase in fishing effort is likely to result in increased interactions between squid vessels and fur seals and possibly sea lions. It is unclear what impact this increased interaction will have on the fur seal and sea lion populations although it is possible that sea lion interactions could be reduced if vessels deploy sea lion exclusion devices (SLEDs) in the SQUIT fishery as they are required to do in the SQU6T fishery. There is also the possibility that if vessels chose to fish longer in SQUIT, when squid abundance is good, this may reduce vessel interactions with sea lions in SQU6T. The effect of fishing activity in SQUIT on the sea lion population has not been such that active management has been required, as is done in SQU6T.

Table 2: Details of estimated fur seal captures from the SQUIT fishery by area, 2003-04 and 2004-05

2003-04	Area			
	Chatham Rise	Pukaki rise	Puysegur	Snares/Stewart Shelf
Number of tows	584	330	251	4534
% observed	<1	5	0	21
No. of observed fur seals caught	0	0	-	10
Estimated no. fur seals caught	0	0	-	74
2004-05	Area			
	Chatham Rise	Pukaki rise	Puysegur	Snares/Stewart Shelf
Number of tows	1515	67	292	5861
% observed	4	2	22	27
No. of observed fur seals caught	3	0	4	8
Estimated no. fur seals caught	80	-	19	42

Source: 'Incidental capture of marine mammals' S. J. Baird and M. H. Smith. ENV2005/02

- 59 The DWG has recently developed an operational procedure for mitigating marine mammal bycatch which sets out the measures vessel operators should take to reduce marine mammal interactions. This operating procedure was reviewed by a marine mammal technical expert group in August 2007 and is currently being updated to reflect the views of this expert group. All vessel operators intending to fish in SQUIT will be required by the DWG to adhere to this procedure. MFish observers will also be auditing vessel performance against this operating procedure throughout the 2007-08 SQUIT fishery.
- 60 It is too early to determine if this operating procedure will be effective and there are justifiable concerns with relying on industry initiatives given that the previous marine mammal code of practice has been less than successful. Industry performance will be monitored closely by both MFish and the DWG in the future.
- 61 MFish considers that the additional risk to bycatch species in the squid fishery that may arise from a TAC and TACC increase under Options 2 and 3 would be sufficiently mitigated for the reasons described above. However, MFish accepts that there is widespread

support for retaining the status quo and believes this suggests you should approve Option 1 which will retain the TAC and TACC at 44,740.88 tonnes.

Other matters for consideration

Future in-season increases

- 62 The driving force behind industry's request for a permanent increase to the SQUIT TAC is the concern amongst some industry participants with the current process for seeking an increase. Some industry members consider the process is too long and often the decision is received too late in the season to be of any real benefit.
- 63 MFish agrees that the current process for seeking an in-season increase could be improved and proposes that a suitable mechanism for considering future increase is developed. MFish proposes to work with DWG to improve this process as part of the development of the squid fisheries plan. MFish will still be required to fully consult with all interested stakeholders on any proposed increase.

Merger of SQUIT and SQUIJ

- 64 Industry is also considering requesting a merger of the SQUIJ and SQUIT TACs and TACCs. The SQUIJ fishery covers the same geographical area as SQUIT but the TACC can only be harvested by fishing vessels engaged in jigging rather than trawling. The SQUIJ TACC is traditionally under caught, for example in 2005-06 only 12% of the TACC was harvested. Industry, through the DWG is currently developing a proposal requesting that you consider merging these two stocks. MFish will refrain from considering this issue until a formal request is received from the DWG but considers this matter can be discussed through the squid fisheries plan.

Monitoring

- 65 Both ECO and Forest & Bird request that observer coverage should be increased in the SQUIT fishery to ensure there is appropriate mitigation of the effects of fishing non-fish bycatch in the fishery. Decisions on the level of observer coverage in the squid fishery are beyond the scope of this final advice paper. MFish does note that the squid fishery already has some of the highest levels of observer coverage across the deepwater fleet. A large part of this observer coverage is directed at the SQU6T fishery but many of the vessels that operate in SQU6T also fish in SQUIT during the same trip.
- 66 MFish has also recently trialed an at-sea audit regime of the voluntary measures in place in the hoki fishery. These voluntary measures include the VMPs to mitigate seabird bycatch and the MMOP described above. These voluntary measures are also in place in the SQUIT fishery and MFish intends to implement a similar audit regime for the coming squid season.

Allocation of the TAC

- 67 Traditionally there has been no allowance for customary Maori interests, recreational fishery interests and other sources of fishing related mortality. There is no known recreational or customary fishing for SQUIT, and no allowance has been provided to non-commercial extractive users.

- 68 However, the NZRFC submission requested that a non-commercial allocation be provided for in the SQUIT fishery. NZRFC proposes that this allocation should be 1% of the TAC because squid is increasingly becoming an important recreational fishery in particular as a source of bait. However, recreational diary survey reports do not indicate that there is a strong recreational squid fishery at the present time. Therefore, MFish does not recommend any allowance be made at this time but will examine this issue as part of the fisheries plan.
- 69 The TAC must be apportioned between the relevant sectors and interests set out under the provisions of s 21 of the Act. Section 21 prescribes that you should make allowances for Maori customary non-commercial interests, recreational fishing interests, and for any other sources of fishing-related mortality, before setting the TACC. In determining these allowances, you should consider how the allowances will enable people to provide for their social, economic and cultural wellbeing (as provided for in the purpose of the Act).
- 70 MFish proposes that you set allowances of 0 tonnes for recreational and Māori customary fishing under this option – consistent with the status quo.
- 71 MFish proposes that the current allowance for other sources of fishing-related mortality is retained at 0% of the TACC. The volume of squid lost during trawling or from discarding of damaged squid is unknown, but as the squid live for about one year, spawn and then die, the level of fishing-related mortality from these other sources is not considered to be a major factor in the sustainability of the stock.

Future Management

- 72 MFish is confident that the squid fisheries plan will be produced in time for the start of the October 2008 fishing season. This fisheries plan will include all squid fisheries in New Zealand and will build on recent initiatives to manage sea bird and marine mammal interaction and will include key bycatch species. Many of the issues raised by industry in their submissions will be addressed through the fisheries plan process. The draft squid fisheries plan will be consulted on widely with stakeholders before being provided to you for approval for the start of the 2008-09 season.

Deemed Values

- 73 MFish considered the deemed values for SQUIT as part of the wider deemed value review. Given the fluctuations in abundance in the fishery and the ability for the TACC to be increased in-season MFish does not consider a deemed value review is necessary at this time. No submissions were received contradicting this view and MFish will recommend to you in the Deemed Value FAP that the deemed values for SQUIT are left unchanged for the coming season.

Compliance Implications

- 74 If you choose to retain the existing TAC and TACC MFish considers there will be no new compliance concerns in the fishery. Existing compliance monitoring will continue to centre on the correct deployment of bird mitigation measures and the correct reporting of bycatch species.

Statutory Considerations

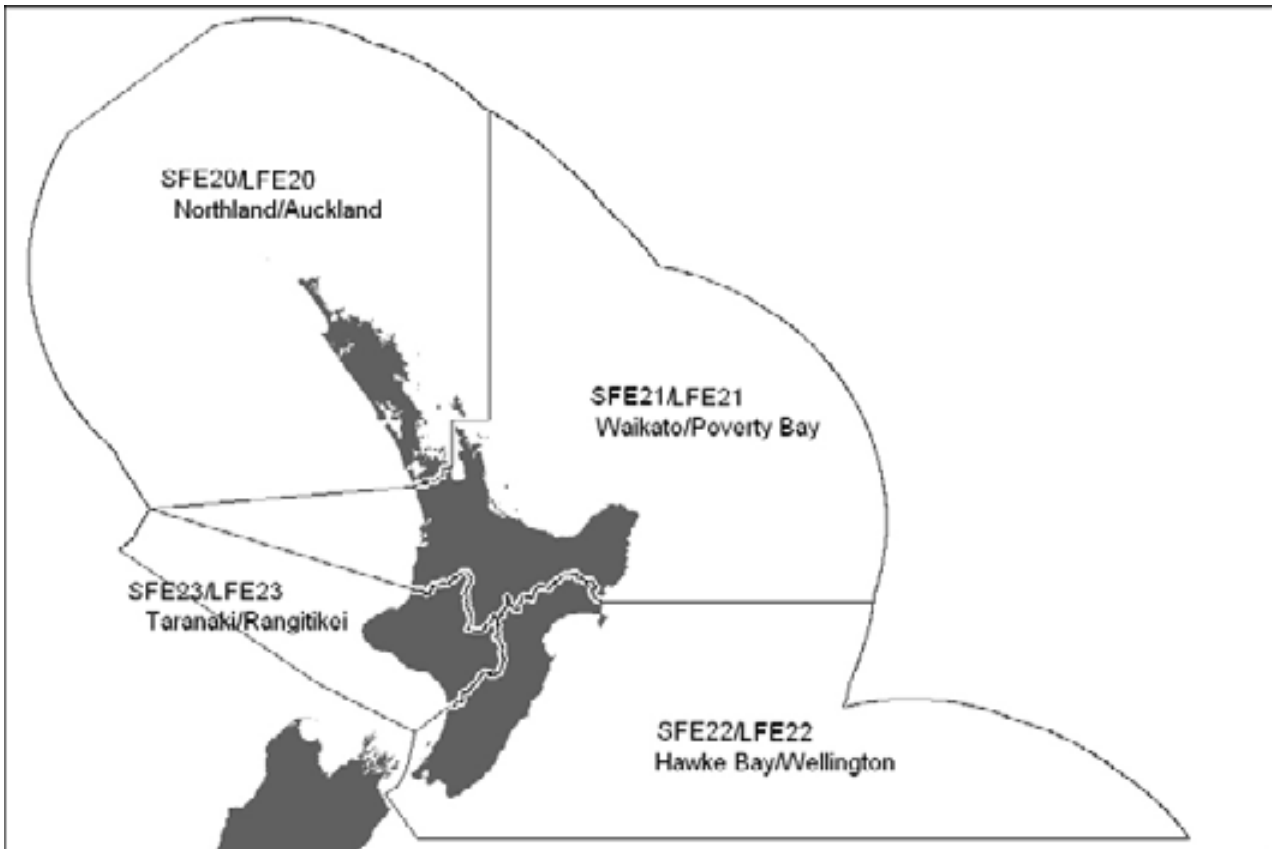
- 75 **Section 8 – Purpose of the Act:** MFish considers all three options available to you for consideration provide for utilisation in the squid fishery while ensuring stock sustainability.
- 76 **Section 9 – Environmental principles:** The requirements under s. 9 of the Act have been considered in preparing these management options. MFish does not have complete information on the likelihood that Options 2 and Option 3 will impact on the long-term viability of associated or dependent species, biological diversity of the aquatic environment or on habitats of particular significance for fisheries management. However, should you choose either Options 2 or Option 3, MFish considers that both voluntary and regulatory measures are contributing to the management of this problem.
- 77 **Section 10 – Information principles:** The management options available to you have been developed based on the best available information.
- 78 However, the likely impact of the TACC increase on seabird and marine mammal populations is uncertain and therefore you should be cautious in making your decision on whether to increase the TAC and TACC. You can choose to retain the status quo which is the MFish preferred option but if you wish to increase the TAC and TACC then Option 2 is the more cautious. You can also permit a TACC increase at any level and are not required to choose either Option 2 or Option 3.
- 79 **Section 5(a) and (b):** Decision-makers are required to act in a manner consistent with New Zealand’s international obligations relating to fishing, including the Law of the Sea and the Fish Stocks agreement as well as regional fishery management agreements. Decision-makers must also act in a manner consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. MFish considers that the proposed 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.
- 80 **Section 11 – Sustainability measures:** The management options described in this FAP have been produced as per the requirements under this section of the Act.
- 81 **Section 11 (1)(a) – Effects on the aquatic environment:** The proposal to increase the SQUIT TACC may affect the aquatic environment beyond current levels. The extent of this impact has been considered in the IPP that accompanies this paper. MFish considers that retaining the status quo will limit the affect the squid fishery has on the aquatic environment beyond current levels.
- 82 **Section 11 (1)(b):** In making your decision 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 SQUIT include a restriction on vessels greater in size than 46m fishing up to 25 nautical miles of the coastline.
- 83 **Section 11 (1)(c):** when making your decision you must also take into account the natural variability of the stock. As discussed in both the IPP and this paper the SQUIT fishery is prone to annual fluctuations in biomass.
- 84 **Section 11(2)(a) and (b):** 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 the TAC and TACC for SQUIT.

- 85 **Section 11 (2)(c):** Section 11(2) also requires you to have regard to any provisions of sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000. Although SQUIT quota management area encompasses the waters of the Hauraki Gulf Marine Park, the distribution of squid and the fishery for it do not intersect with the park boundaries. Therefore, there are no relevant considerations under the Hauraki Marine Park Act 2000
- 86 **Section 11(2A)(a) and (c):** Before setting or varying any sustainability measure 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 SQUIT fishery.
- 87 **Section 11A – Fisheries plans:** There is currently no fisheries plan in place in the SQUIT fishery.
- 88 **Section 12 – Consultation:** In preparing this FAP MFish has consulted with such persons or organisations that have an interest in the stock or in the effects that fishing this stock might have on the aquatic environment.
- 89 **Section 14 – Alternative TAC permitted** – Squid is managed under s. 14 as it is a quota species listed on the Third Schedule of the Act. This means the TAC for the stock can be set without reference to maximum sustainable yield (MSY). You must be satisfied that the purpose of the Act will be better achieved by setting a TAC otherwise than in accordance with s 13(2). Due to biological characteristics of squid, it is appropriate to set the TAC without reference to MSY.
- 90 **Section 15 – Protected species:** Section 15 of the Act requires you to take such measures as you consider necessary to avoid, remedy or mitigate the effect of fishing-related mortality on any protected species. A number of species of seabirds that interact with squid trawl vessels are protected. If you consider the adverse effects of such a TAC increase are not currently sufficiently mitigated you can request that appropriate regulations are implemented under s. 15(4).
- 91 **Section 20 and 21 - TACC:** The allowances for Maori customary non-commercial interests, recreational fishing interests, and for any other sources of fishing-related mortality, before setting the TACC, are discussed in the section under “*TAC allowances*”. However, s. 21 requires that any mātaihai reserve or closure/restriction under s. 186A to facilitate customary fishing be taken into account. There are mātaihai reserves and s. 186A measures in SQUIT, but none intersect with the SQUIT fishery. No area has been closed or fishing method restricted (that affects the fishery within SQUIT) under the customary fishing provisions of the Act. Section 21 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 SQUIT.
- 92 **Section 75 – Minister to set deemed value rates:** The deemed value rates for SQUIT were reviewed as part of the wider deemed value review process. MFish considers that the current deemed value rates provide fishers with the necessary incentive to balance all their catch with ACE as per s. 75 (2)(a) of the Act.

NORTH ISLAND EELS (SFE 20-23, LFE 20-23) - FINAL ADVICE

Figure 1: Quota management areas for shortfin (SFE) and longfin (LFE) eel stocks - North Island.



Executive Summary

Purpose

- 1 This paper provides final advice to you on proposals for shortfin eel (SFE – *Anguilla australis* / *A. reinhardtii*) and longfin eel (LFE – *A. dieffenbachii*) stocks of the North Island (see Figure 1). MFish recommends that the total allowable catches (TACs) are varied by reducing the TACs in accordance with section 14(3) of the Fisheries Act 1996 (the Act).
- 2 Should you reduce any of these TACs, a decision is required on the allowances for customary interests, recreational interests, and other sources of fishing related mortality, as required by section 21 of the Act, in deciding on the total allowable commercial catch (TACC) under section 20 of the Act.
- 3 In making the TAC decisions, MFish asks that you confirm the existing management strategy for the North Island eel fishery.

Background

- 4 The North Island eel fishery was introduced into the quota management system (QMS) in October 2004. TACs were set under section 14 of the Fisheries Act 1996 (the Act) on the basis that, at the time, there were difficulties with estimating maximum sustainable yield. The initial TACs were considered a reasonable starting point, although it was acknowledged that further initiatives to improve the fishery would be required over the short to medium term.
- 5 Section 14 of the Act provides an alternative means for setting a TAC where stocks meet the criteria set out in section 14(8). For those stocks provided the Minister is satisfied that the purpose of the Act would be better achieved the Minister may set the TAC other than in accordance with the requirements of section 13 of the Act, ie with reference to maximum sustainable yield. However, the TAC must be set in a way that ensures the stock is sustainable. Under section 14(3) the TAC for the stock can be varied by increasing or reducing the TAC.
- 6 To better serve the purpose of the Act, the previous Minister agreed to a management strategy to improve the stock structure (ie, size composition) and abundance of eels over the medium term (10 years), while bringing to a halt any decline in the fishery over the short term. The Minister's intention was to ensure that:
 - a) The fishery is sustainably managed;
 - b) The fishery's availability to non-commercial fishers is improved; and
 - c) The relationship with interdependent stocks is improved.

The current initiative

- 7 The current assessment from the Stock Assessment Plenary 2007 concludes there is a high risk that current exploitation levels for longfin are unsustainable. For shortfin, the same sustainability risk does not apply, but caution is required given the nature of eel biology.
- 8 Monitoring of shortfin and longfin commercial catch from across the North Island indicates that the average size of shortfins and longfins are much reduced from former times. Similarly, the proportion of longfin to shortfin in commercial catch landings has significantly altered over time, such that longfin are now a much smaller proportion of the commercial catch.
- 9 Preliminary results from longfin population modelling indicate that harvest rates for longfin stocks are relatively high for a species with low productivity. More conservative levels of harvest are required to ensure an adequate proportion of adults reach sexual maturity and undertake their seaward migration at the end of their life (ie, spawning escapement). Further, the number of elvers (juvenile eels) caught at monitoring sites suggests that recruitment is relatively low (particularly longfin) in comparison to historic observations.
- 10 Commercial catches of shortfin and longfin have reduced following the introduction of North Island eel stocks into the QMS. The catch reduction was quite marked in the 2004-05 fishing year as the industry underwent change. However, in the following fishing year, the TACCs continued to be significantly under-caught for all but one shortfin stock (SFE 22). These trends of reduced commercial catch have continued into the 2006-07 fishing year. MFish considers that the on-going trend of reduced commercial catch in the North Island is

more likely to be linked to the depleted state of the fishery, rather than other factors that might affect fishing success. However, should commercial catches increase to the level of the existing TACCs, this is likely to be contrary to the sustainability and utilisation outcomes sought for the fishery.

- 11 In addition, there have been significant concerns about utilisation of eel stocks from all fishery interests. Fishery interests, particularly tangata whenua, are concerned about the state of the shortfin and longfin stocks. They wish to see improvements in average size and relative abundance of eels, so that their social, cultural and economic well-being is enhanced.

Release of Initial Position Paper

- 12 An Initial Position Paper (IPP), released on 19 June 2007, proposed to reduce TACs for the four shortfin and four longfin eel stocks of the North Island.
- 13 For all shortfin stocks, it was proposed to either reduce the TAC to a mid-point between the existing TAC and recent catch levels (shortfin option 1), or to reduce the TAC to a level at or near recent catch (shortfin option 2). For all longfin stocks, it is proposed to either reduce the TAC to a level at or near recent catch (longfin option 1), or reduce the TAC to a level about 20% less than recent catch (longfin option 2).
- 14 Further, within all TAC options proposed, MFish proposed that the existing allowances for customary fishing and other sources of fishing related mortality be retained, and either:
- a) reduce the recreational allowance and the TACC (proportional approach); or
 - b) maintain the existing recreational allowance and reduce the TACC only (non-proportional approach).
- 15 MFish indicated in the IPP that if you decide to reduce the TAC for any stock, its preference is to retain the existing recreational allowance and reduce the TACC only.

Analysis

- 16 Commercial interests agreed that a conservative management approach is required for longfin, but sought a more comprehensive review of eel fishery management. Environmental, customary Maori, and recreational interests generally supported significant reductions in TACs for all shortfin and longfin stocks.
- 17 MFish recommends that you reduce TACs for shortfin stocks to a level at or about recent catch (shortfin option 2). Further, MFish recommends you reduce TACs for longfin stocks to a level at or about 20% below recent catch (longfin option 2). MFish considers that these actions will reduce the sustainability risks arising from the current North Island shortfin and longfin TACs, and/or provide a better basis from which shortfin and longfin stocks can be rebuilt.
- 18 MFish recommends that customary allowances, and the allowance for other sources of fishing related mortality should be retained for all stocks.

- 19 Recreational allowances were proposed to be either reduced on a proportional basis consistent with the percentage reduction for TACCs, or on a non-proportional basis. Non-commercial submitters generally supported a non-proportional approach, such that only the TACC is to be reduced. Commercial interests took the view that all parties should contribute to an improved fishery.
- 20 MFish prefers the non-proportional approach for each of the North Island eel stocks at this time. This would be consistent with statutory obligations, particularly for Maori non-commercial interests within each of the stocks, and the desire to improve the availability of eels to non-commercial interests more generally. In addition, the TACC for most eel stocks are not fully utilised, and the impacts of reduced TACCs on the commercial fishery could be more readily absorbed with less social, cultural, and economic effects.
- 21 Commercial interests are concerned that a more integrated approach to management of the eel fishery is required on a national basis. However, MFish does not consider that initiatives to improve significant parts of the biological stock (ie, the North Island) should be deferred while any future integration across the biological stock is considered.
- 22 Similarly, the consideration of other complementary measures to sustain eel fisheries (other than catch limits) will also require more time. Some progress to introduce complementary measures was made in 2004. Development of a fisheries plan should refine the management objectives for the fishery, and assist in identifying the right mix of tools to apply to meet those objectives.

The Issue

- 23 Freshwater eels have relatively unique life history characteristics in comparison to other fish species resident in New Zealand. They breed only once, migrating from the area where they have spent much of their life to an oceanic spawning ground in the South Pacific (or the Coral Sea for *A. reinhardtii*). Eel fisheries around the world are based on pre-spawning fish. Worldwide, eel fisheries are in serious decline. New Zealand eel fisheries are possibly in better health, but remain vulnerable.
- 24 There are concerns about sustainability and utilisation outcomes for the shortfin and longfin eel fisheries in the North Island. Non-commercial fishers are concerned that eels are not as abundant as they once were, and/or of a reasonable size. Commercial interests, who developed their industry since the 1960s, are similarly concerned about the need to improve the fishery following significant catches in recent decades.
- 25 North Island eel stocks were introduced into the QMS in 2004. There are four shortfin and four longfin stocks. The North Island is the most significant eel fishery in the country, in terms of overall catch quantity and the range of fishery interests. Use of the South Island eel fishery has significantly reduced since its introduction into the QMS in 2000.
- 26 The management strategy for the North Island eel fishery agreed to by the former Minister was to improve the stock structure (ie, size composition) and abundance of eels over the medium term (10 years), while bringing to a halt any decline in the fishery over the short term. The Minister's intention was to ensure that:
- a) The fishery is sustainably managed;
 - b) The fishery's availability to non-commercial fishers is improved; and

- c) The relationship with interdependent stocks is improved.
- 27 TACs for North Island eel stocks were set in 2004 at a level lower than estimated catches from all sectors for the twelve year period 1990-2002. The resulting TACs were considered a reasonable starting point, but further reductions were considered probable. Following QMS introduction, there was some industry rationalisation in the 2004-05 fishing year. However, commercial catch has not yet reached the TACCs set in 2004 (except in SFE 22 in the 2005-06 fishing year). The level of non-commercial catch in recent years (since 2004) is unlikely to have changed as the characteristics of the fishery have not shown any significant improvement, and feedback on the use of the fishery by non-commercial interests has not significantly changed.
- 28 Other than the continued under-catch of the TACCs, a range of other information is now available that indicates that sustainability and utilisation concerns need to be addressed. MFish observes that:
- a) The Stock Assessment Plenary 2007⁷² concluded there is a high risk that current exploitation levels for longfin are unsustainable. For shortfin, the same risk does not apply, but caution is required given the nature of eel biology and exploitation before undertaking a spawning migration at the end of their life;
 - b) Average size of shortfin and longfin eels sampled in commercial catch in recent years is disproportionately represented by small individuals;
 - c) The ratio of longfin to shortfin in commercial catches is significantly less than it was in earlier decades;
 - d) Preliminary longfin modelling studies indicate that longfin harvest rates may be too high;
 - e) Indices of elver abundance at upstream migration monitoring sites remains relatively low in comparison to historical observations, and the small proportion of longfin elvers observed is of concern; and
 - f) Anecdotal observations largely favour the view that the fishery requires rebuilding from its current depleted state, even though some stocks may not be facing significant sustainability concerns in the short term.
- 29 There are a number of initiatives that MFish intends to take over the medium term to improve both sustainability and utilisation of the fishery. These initiatives include the development of fisheries plans, the implementation of other complementary measures to ensure sustainability, a proposed amendment of the Fisheries (Kaimoana Customary Fishing) Regulations 1998, consideration to integrate management frameworks with the South Island eel fishery, reporting refinements, and further research. However, the results of these initiatives are unlikely to be seen for at least two years.
- 30 MFish does not consider that management action should be deferred until the outcome of these other initiatives is complete. Action is required to remove the risk that existing catch limits are too high and could allow further catch that is either unsustainable, or contrary to the objective of rebuilding the fishery. In particular, it is considered that current exploitation levels of longfin are unsustainable.

⁷² This document summarises the conclusions and recommendations of scientists and other fishery interests on the Eel Fishery Assessment Working Group.

- 31 Reducing catch limits is an effective means to reduce sustainability concerns, but also to improve utilisation opportunities over the medium term. Reducing catch limits, and rebuilding the status of both shortfin and longfin stocks, would be in keeping with statutory obligations, particularly to non-commercial Maori interests.

Summary of Options

Initial Proposal

- 32 The IPP proposed a range of options for catch limits and allowances for each shortfin and longfin stock in the North Island.
- 33 For quota management area 20 (Northland/Auckland), the options for proposed TACs, allowances and TACCs are shown in Table 1.

Table 1: Options for proposed TACs, allowances and TACCs (in tonnes) for SFE 20 and LFE 20. 'Other' means the allowance for other sources of fishing related mortality.

Stock Option	Allocation	TAC	Recreational Allowance	Customary Allowance	Other	TACC
SFE 20 option 1	Proportional	179	23	30	4	122
	Non-proportional	179	28	30	4	117
SFE 20 option 2	Proportional	148	18	30	4	96
	Non-proportional	148	28	30	4	86
LFE 20 option 1	Proportional	45	5	10	2	28
	Non-proportional	45	8	10	2	25
LFE 20 option 2	Proportional	39	4	10	2	23
	Non-proportional	39	8	10	2	19

- 34 For quota management area 21 (Waikato/Poverty Bay), the options for proposed TACs, allowances and TACCs are shown in Table 2.

Table 2: Options for proposed TACs, allowances and TACCs (in tonnes) for SFE 21 and LFE 21. 'Other' means the allowance for other sources of fishing related mortality.

Stock Option	Allocation	TAC	Recreational Allowance	Customary Allowance	Other	TACC
SFE 21 option 1	Proportional	195	18	24	4	149
	Non-proportional	195	19	24	4	148
SFE 21 option 2	Proportional	181	16	24	4	137
	Non-proportional	181	19	24	4	134
LFE 21 option 1	Proportional	75	8	16	2	49
	Non-proportional	75	10	16	2	47

LFE 21 option 2	Proportional	60	6	16	2	36
	Non-proportional	60	10	16	2	32

35 For quota management area 22 (Hawke Bay/Wellington), the options for proposed TACs, allowances and TACCs are shown in Table 3.

Table 3: Options for proposed TACs, allowances and TACCs (in tonnes) for SFE 22 and LFE 22. 'Other' means the allowance for other sources of fishing related mortality.

Stock Option	Allocation	TAC	Recreational Allowance	Customary Allowance	Other	TACC
SFE 22 option 1	Proportional	128	10	14	2	102
	Non-proportional	128	11	14	2	101
SFE 22 option 2	Proportional	121	10	14	2	95
	Non-proportional	121	11	14	2	94
LFE 22 option 1	Proportional	41	4	6	2	29
	Non-proportional	41	5	6	2	28
LFE 22 option 2	Proportional	34	3	6	2	23
	Non-proportional	34	5	6	2	21

36 For quota management area 23 (Taranaki/Rangitikei), the options for proposed TACs, allowances and TACCs are shown in Table 4.

Table 4: Options for proposed TACs, allowances and TACCs (in tonnes) for SFE 23 and LFE 23. 'Other' means the allowance for other sources of fishing related mortality.

Stock Option	Allocation	TAC	Recreational Allowance	Customary Allowance	Other	TACC
SFE 23 option 1	Proportional	43	4	6	2	31
	Non-proportional	43	5	6	2	30
SFE 23 option 2	Proportional	36	4	6	2	24
	Non-proportional	36	5	6	2	23
LFE 23 option 1	Proportional	41	5	14	2	20
	Non-proportional	41	9	14	2	16
LFE 23 option 2	Proportional	34	4	14	2	14
	Non-proportional	34	9	14	2	9

Final Proposal

37 For North Island eel stocks in general, MFish recommends that you:

- a) Agree that TACs should be varied under section 14(3) of the Act;

- b) Confirm the management strategy, as agreed to by the previous Minister, which is to improve the stock structure (ie, size composition) and abundance by 2014, while bringing to a halt any decline in the fishery over the short term;
- c) Confirm that the intent of the management strategy is to ensure sustainability, improve the availability of eels to non-commercial fishers, and improve the relationship with interdependent stocks;
- d) Agree to use a non-proportional approach to vary allowances (under section 21 of the Act) and TACCs (under section 20 of the Act).

38 For each stock, MFish recommends you:

Northland / Auckland (QMA 20)

- a) Reduce the SFE 20 TAC from 211 tonnes to 148 tonnes; and within this set:
 - i) a customary allowance of 30 tonnes;
 - ii) a recreational allowance of 28 tonnes;
 - iii) an allowance for other sources of fishing related mortality of 4 tonnes;
 - iv) a TACC of 86 tonnes.
- b) Reduce the LFE 20 TAC from 67 tonnes to 39 tonnes; and within this set:
 - i) a customary allowance of 10 tonnes;
 - ii) a recreational allowance of 8 tonnes;
 - iii) an allowance for other sources of fishing related mortality of 2 tonnes;
 - iv) a TACC of 19 tonnes.

Waikato / Poverty Bay (QMA 21)

- c) Reduce the SFE 21 TAC from 210 tonnes to 181 tonnes; and within this set:
 - i) a customary allowance of 24 tonnes;
 - ii) a recreational allowance of 19 tonnes;
 - iii) an allowance for other sources of fishing related mortality of 4 tonnes;
 - iv) a TACC of 134 tonnes.
- d) Reduce the LFE 21 TAC from 92 tonnes to 60 tonnes; and within this set:
 - i) a customary allowance of 16 tonnes;
 - ii) a recreational allowance of 10 tonnes;
 - iii) an allowance for other sources of fishing related mortality of 2 tonnes;
 - iv) a TACC of 32 tonnes.

Hawke Bay / Wellington (QMA 22)

- e) Reduce the SFE 22 TAC from 135 tonnes to 121 tonnes; and within this set:

- i) a customary allowance of 14 tonnes;
 - ii) a recreational allowance of 11 tonnes;
 - iii) an allowance for other sources of fishing related mortality of 2 tonnes;
 - iv) a TACC of 94 tonnes.
- f) Reduce the LFE 22 TAC from 54 tonnes to 34 tonnes; and within this set:
- i) a customary allowance of 6 tonnes;
 - ii) a recreational allowance of 5 tonnes;
 - iii) an allowance for other sources of fishing related mortality of 2 tonnes
 - iv) a TACC of 21 tonnes.

Taranaki / Rangitikei (QMA 23)

- g) Reduce the SFE 23 TAC from 50 tonnes to 36 tonnes; and within this set:
- i) a customary allowance of 6 tonnes;
 - ii) a recreational allowance of 5 tonnes;
 - iii) an allowance for other sources of fishing related mortality of 2 tonnes;
 - iv) a TACC of 23 tonnes.
- h) Reduce the LFE 23 TAC from 66 tonnes to 34 tonnes; and within this set:
- i) a customary allowance of 14 tonnes;
 - ii) a recreational allowance of 9 tonnes;
 - iii) an allowance for other sources of fishing related mortality of 2 tonnes;
 - iv) a TACC of 9 tonnes.

Consultation

- 39 Your decision whether or not to vary the TAC for shortfin and longfin stocks of the North Island is a decision under section 14(3) of the Act and therefore the consultation requirements of section 12 apply.
- 40 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.
- 41 MFish staff attended a number of hui during the time period available for consultation and input and participation at which the proposals were canvassed and discussed. This included presentations or discussions with four customary Forums where hapu and iwi representatives from a broad geographical area of the North Island attended – Te Hiku o te Ika (Far North), Te Waka a Maui (North Island customary freshwater interests), Nga Hapu o

te Uru (Waikato/King Country), and Te Kupenga Whiturauroa a Maui (Mahia to Turakirae Head, Wellington).

Submissions Received

42 Submissions regarding the proposals were received from:

- Aotearoa Fisheries Limited (AFL)
- Bruce Dawson – commercial fisher
- Eel Enhancement Company Ltd (EECo)
- Environs Holdings Ltd – the subsidiary of Te Uri o Hau Settlement Trust (Environs)
- Environment and Conservation Organisations of NZ Inc. (ECO)
- Huakina Development Trust, Pukekohe
- Hokianga Accord – representing non-commercial fishers
- Mootakotako Marae, Aotea Harbour
- New Zealand Conservation Authority (NZCA)
- New Zealand Recreational Fishing Council (NZRFC)
- Nga Hapu o Te Uru o Tainui (NHOTU)
- Te Kupenga Whiturauroa a Maui Regional Kaitiaki Fisheries Forum (Te Kupenga), Masterton
- The New Zealand Seafood Industry Council Ltd (SeaFIC)
- Te Ohu Kai Moana Trustee Ltd (TOKM) – late submission, not analysed
- Te Kotahitanga o Te Arawa Waka Fisheries Trust Board (TKOTAW)
- Te Papaorotu Marae, Whatawhata
- Te Runanga o Te Rarawa
- Waahi Whaanui Trust (WWT), Huntly
- Waikato Raupatu Trustee Company Ltd (Waikato Raupatu)
- Wellington Conservation Board (WCB).

43 A summary of submissions is attached to this paper.

MFish Discussion

Consultation, and input and participation

- 44 In their submissions, two parties sought engagement with MFish before decisions on sustainability measures on North Island eel stocks are made. Both these submitters received the IPP at the start of the consultation period. Neither submitter contacted the relevant staff within MFish to discuss the proposals during the time period available for this purpose.

Use and values of eel fishery

- 45 Tangata whenua generally identified their close association with eels, as taonga, as part of their customs, and as a source of sustenance. Submitters confirm the non-commercial use of eels is of high importance, and contributes significantly to social, cultural and economic well-being. Recreational fishing interests submitted that eel fishing contributes to the well-being of the non-commercial sector, particularly in inland areas. These interests highlight the need to improve availability and access to reasonably sized eels, such that these values, and therefore well-being, can be enhanced.
- 46 Some commercial interests question the way in which non-commercial uses and values were described in the IPP. They believe emphasis should simply be on advising the Minister that there is no information on non-commercial catch, and the question remains as to whether the current non-commercial allowances and bag limits are adequate to meet their needs. Further, SeaFIC offers an interpretation of the meaning of the word 'subsistence' to a relatively narrow set of social circumstances and dependency. SeaFIC queries the relative weight of the word when applied to allocation decisions. Further, it questions whether fisheries legislation should be used to address broader socio-economic conditions in society.
- 47 MFish acknowledged in the IPP that quantitative information on non-commercial use of the eel fishery was lacking. However, the description of the uses and values associated with this resource are informative and fair to the sectors involved. Tangata whenua and other non-commercial interests wish to see their use and values recognised (as does the commercial sector), as it contributes to their well-being. Consideration of the manner in which the resource is used by a range of sectors provides some context for the management decisions required, and the social, cultural and economic well-being that may be affected.
- 48 MFish has not suggested in the IPP that fisheries legislation should be used to alleviate broader socio-economic conditions in society. Nevertheless, there is discretion available within the Act for the Minister to determine what level allowances and TACCs should be set at. For example, the Minister might consider that the purpose of the Act could be better achieved where allowances for non-commercial fishing are either maintained or increased. The consequences of such a course of action, rather than the intent, might be that other prevailing social conditions are addressed (eg, poverty). Similarly, it could be argued that such socio-economic conditions could be addressed by providing economic opportunities, through economic well-being considerations of the Act.
- 49 For the purposes of this section of the final advice, MFish is merely acknowledging that different sectors use the resource in different ways, and have various motives for that use, and therefore different well-being outcomes. The extent of social, cultural and economic well-being derived from the resource will vary depending on the allowances made for non-commercial fishing interests and the TACC set for each stock.

Views on management strategy

- 50 When introducing North Island eel stocks into the QMS, the previous Minister agreed to an overall management strategy. The management strategy is to improve the stock structure (ie, size composition) and abundance of eels over the medium term (10 years from 2004), while bringing to a halt any decline in the fishery over the short term. The intention is to ensure that:
- a) The fishery is sustainably managed;
 - b) The fishery's availability to non-commercial fishers is improved; and
 - c) The relationship within independent stocks is improved.
- 51 There is general consensus amongst customary, recreational, and environmental interests that the eel fishery requires additional management action to restore, rebuild, and improve the status of the fishery. Therefore, these interests support a conservative management strategy. Commercial interests have mixed views – EEC0 and AFL both support a conservative management strategy, or specifically the current management strategy, while SeaFIC believes a rethink of the management approach is required.
- 52 Commercial interests consider that the approach to management should be assessed on a national basis, consistent with the biological distribution of the species. Adjusting the management settings of the eel fishery has been an iterative process over the past decade. The introduction of the eel fishery into the QMS was undertaken in three phases (South Island – 2000, Chatham Island – 2003, and North Island – 2004). Similarly, the framework for authorising customary use in the freshwater environment differs between the South Island and the rest of the country. The customary framework for the North and Chatham Islands is presently being reviewed. A letter proposing a regulatory amendment was dispatched to fishery interests on 29 August 2007. Other sustainability measures, such as the maximum size limit for the commercial sector, have only recently been consistently applied across the country.
- 53 There are a variety of historical reasons for these differences, and the time period for their gradual introduction. Nevertheless, these earlier initiatives provided a platform for a degree of change from the old ways of management to the new. However, as noted in the IPP, some of these earlier initiatives require review or refinement. These are resource intensive exercises in themselves.
- 54 MFish has progressively sought to remove unnecessary inconsistencies in eel management, and fine-tune existing management settings as opportunities arise. As noted in the IPP, the current initiative to review North Island catch limits is part of a longer term objective to significantly improve the status of eels and reduce sustainability risks to the fishery, while improving the social, cultural and economic well-being of fishery interests.
- 55 Some commercial interests consider that the current management strategy is not satisfactorily defined, such that value to all stakeholders is maximised. MFish appreciates the basis for this view, as the current management strategy is set at a high level, in recognition that many interests will have more specific objectives they would like to see addressed.
- 56 The current management strategy aims to capture many of the common aspirations of a broad range of fishery interests, and is not necessarily that different from what would be

expected if the stocks were managed under section 13 of the Act. Further specification of the management objectives and the tools to achieve these objectives will need to be developed over the next few years, and in conjunction with fishery interests from across the spectrum.

- 57 Commercial interests point to a need to consider a range of management measures to address the variety of fisheries management objectives for the fishery at this time. MFish has previously noted that other complementary fisheries management tools should be considered to meet fisheries management objectives for the eel fishery. MFish took the initiative to introduce some of these in 2004-05 (eg, closed commercial areas for purpose of protecting eel populations prior to spawning) and has signalled that more work on such measures is likely to occur in the near future.
- 58 However, the present review of catch limits for North Island eel stocks is not in conflict with the use of other complementary tools to meet the current management strategy. This proposal serves to reduce sustainability risks and help rebuild eel stocks. Should North Island catch limits be reduced, further development of other initiatives can be progressed with some confidence that the fishery should not deteriorate from its current state.
- 59 There is sufficient consensus on the current management strategy for it to be applied to the current review of catch limits and allowances. MFish also highlighted in the IPP that fisheries management objectives for the fishery could be better articulated in a fisheries plan. Development of a fisheries plan could take some years depending on its relative priority, and the ability of relevant fishery interests to engage in the process.
- 60 In the interim, MFish concludes the current management strategy for North Island eel fisheries should be retained as it sets a general direction that is supported by the majority of fishery interests. There is still scope for a range of initiatives to be taken in the intervening years prior to the development of a fisheries plan, where they are of sufficient priority.
- 61 Lastly, MFish disagrees with the claim that it has done very little towards maximising value of the eel resource, and enhancement of the commercial sector. For example, the introduction of eel stocks into the QMS has provided a much better basis on which commercial operations can be conducted, and adjusting sustainability measures aims to improve the fishery for the future, for all interests.

Rationale for Management Options

Introduction

- 62 As noted in the IPP, MFish is not confident that the management strategy outcomes for North Island eel stocks will be achieved by 2014 at current TAC levels. In terms of sustainability outcomes, the MFish Stock Assessment Plenary 2007 concludes there is a high risk that the current exploitation levels for longfin are unsustainable. For shortfin, the Plenary advises that the same risk does not apply, although caution is required given the nature of eel biology and exploitation before spawning escapement. Accordingly, the options for TAC adjustments reflect the higher level of concern for longfin in comparison to shortfin. The rationale for management action also relates to better achievement of utilisation outcomes – in general terms, the rebuild of all stocks.

Submitter's response to the general approach

- 63 Submissions from recreational, customary and environmental interests all support the rationale for a reduction in catch limits. Some of these interests support a more significant reduction than the TAC options proposed for either shortfin or longfin stocks. These interests do not consider that the proposed TAC reductions are sufficient to enable a rebuild in either the shortfin or longfin stocks.
- 64 Submissions from commercial submitters generally query the basis for the proposed reductions, and the use of catch limits in comparison to other management measures. Some commercial submitters argue that it is too soon to determine whether the initial catch limits were set too high, and there is a lack of adequate information on which to justify a strong case for a sustainability issue. EECO provides some alternative suggestions for reduced longfin catch limits. These are expressed as the resulting TACCs, rather than TACs. Commercial submitters consider that shortfin catch limits do not need to be changed at this time, as a sustainability risk is not evident.

Assessment of submitter's response to general approach

Reflection on rationale for change to catch limits

- 65 MFish is of the view that sustainability and utilisation concerns for both shortfin and longfin are genuine and require attention. Concerns extend from the need to halt any further decline in eel stocks, but also to rebuild the fishery from a depleted state. Similarly, the observations of a broad range of interests, from a number of geographical areas, support the need to rebuild the fishery.
- 66 An adjustment in catch limits is a relatively simple and effective way to achieve reduced sustainability risk and allow more assurance that the fishery will rebuild to meet the aspirations of fishery interests. A reasonable reduction in catch limits should allow eels to:
- a) become more abundant;
 - b) grow to a larger average size;
 - c) contribute more to food web dynamics of freshwater ecosystems;
 - d) leave freshwater to spawn as sexually mature adults in greater numbers; and
 - e) depending on whether there is a relationship between spawning biomass and the number of recruits, increase the number of juvenile eels that return to New Zealand estuaries and rivers.
- 67 Improvements at the level of the stock may take several years to eventuate, and become apparent, as more recent management actions to constrain catch, and improve the fishery's performance more generally, come to pass. For longfin stocks, any improvements at the level of the stock could take a much longer time period to eventuate. Should these broad improvements occur, positive outcomes are likely to extend to all interdependent stocks, and the availability of eels to non-commercial fishers, in terms of either suitably sized eel, or numbers, or both. These benefits similarly apply to commercial fishers who may fish more efficiently and selectively in an improved fishery.
- 68 In essence, appropriately set catch limits can lower exploitation to sustainable levels. The use of other complementary measures may alter the degree to which catch limits are

adjusted in future, as well as the effectiveness of any varied catch limit from October 2007. However, fisheries management objectives for the eel fishery have yet to be refined, or reconciled in some instances. Given the significance of that step, and the assessment required thereafter to evaluate other complementary tools, the use of the catch limit tool to address generic sustainability and utilisation concerns in each stock is desirably simple at this time.

Shortfin stocks

- 69 Proposals to reduce TACs for shortfin stocks will seek to limit any potential increase in catch. At present, there is potential for commercial catch to increase as the TACC has been under-caught in 3 of the 4 stocks (ie, except SFE 22 in the 2005-06 fishing year). An increase in principally commercial catch is unlikely to be consistent with a desire to rebuild shortfin stocks. The two options for shortfin TACs seek to reduce this risk by varying degrees. You may elect to choose either option when considering a variation to the TAC for any of the shortfin stocks.
- 70 Varying the TAC in accordance with shortfin option 1 (at a mid-point between the existing TAC and recent catch) would provide for some further catch, and may, on further monitoring, be consistent with attempts to rebuild the fishery. Use of this option would result in less impact on fishers in the short term, particularly where there is some 'headroom' between existing catch and TACCs or allowances. However, there may be less opportunity for improvement in the rebuilding of shortfin stocks over the medium term using this option. The probability of an improvement in a stock's status using this approach is unknown.
- 71 Varying the TAC using shortfin option 2 (at or about recent catch) will provide a better opportunity for improvements in the fishery, and would be a more cautious approach. Reducing TACs using shortfin option 2 at this time should increase the probability that the rebuild of the fishery is achieved sooner rather than later. This would allow more time to assess whether the level of recent use is leading to positive changes in the fishery. Varying the TAC for a shortfin stock in accordance with shortfin option 2 would recognise the view that retaining a higher catch limit is less likely to improve the status of the stock over the short to medium term. It would also signify a desire to rebuild the stock in question with greater certainty.
- 72 The social, cultural and economic impacts of a reduction in TACs for shortfin stocks may be less now than if these reductions are required in a few years, should there be an increase in the use of the shortfin resource in the intervening time. The relative impact in the short to medium term will be dependent on the level of recent use by the different sectors, and the approach to the varying of allowances in revising TACCs. In general, the effects of applying shortfin option 2 will be greater than shortfin option 1, and you will need to consider whether the benefits of reduction at a greater level outweigh the likely medium term costs of reduced catch.

Longfin stocks

- 73 The vast majority of submitters accept the rationale that sustainability measures for longfin stocks need to be more conservative than shortfin stocks. Most submitters agree that a significant reduction in TACs will assist in reducing the risk of sustainability concerns, although some industry submitters wish to investigate other options over the next few years.

MFish notes that longfin stocks are endemic to New Zealand, and there is no other source of recruitment to the fishery.

- 74 On the basis that current levels of exploitation are considered to be unsustainable, it is appropriate to at least reduce TACs to levels of recent catch (longfin option 1) for the short term. Choosing this option may be feasible if you elected to review catch limits or other complementary measures within the next couple of years.
- 75 However, the weight of scientific information summarised in the IPP, and as discussed in more depth at Eel Fishery Assessment Working Group meetings, supports a more cautious approach (longfin option 2) for implementation at the first reasonable opportunity. This sense of immediacy is consistent with the intentions of the management strategy, and the timeline for its achievement.
- 76 MFish considers that the social, cultural and economic impacts of acting to reduce TACs now will be less than the implementation of more significant sustainability measures if existing trends in the fishery were left unchecked. The benefits of reducing TACs in accordance with longfin option 2 outweigh the medium term costs of reduced catching opportunities.

Other factors to consider when reflecting on proposed rationale

- 77 Environmental degradation is an issue that affects eel populations. This factor was particularly important in the past given the transformation of land and development of hydro-electric power generation, but also incrementally in recent years (eg, management of riparian margins, pollution, culverts, weirs and irrigation schemes). At the level of considering the TAC for a stock, most of these impacts are likely to have had a negative effect. Further, eel species composition, relative abundance, and population biomass have significantly altered since commercial fishing commenced. In the longer term, it would be desirable to better link the effects of habitat modifications on aquatic life, and fishing interests using that aquatic life.
- 78 Some commercial submitters suggest the MFish final advice of June 2004 provides that any necessary refinements to management settings in future years are dependent on a review of commercial and non-commercial catch information and new scientific information. Commercial submitters suggest that no new scientific information or non-commercial catch information is available for consideration and accordingly the current review is premature. MFish does not agree with this view.
- 79 MFish notes that it has summarised the key findings of recent research undertaken on the eel fishery in the IPP. In addition, the commercial submitters concerned have been involved in Eel Fishery Assessment Working Groups where the detail of this research has been reviewed. The best information available suggests that sustainability and utilisation concerns are apparent. It is not essential for MFish to be in possession of all possible information before taking management action.
- 80 In setting out the approaches for the calculation of proposed TACs in this review, reference is made to recent catches made since 2004-05. In the absence of quantitative information at the level of the stock, MFish assumed that the level of non-commercial catch is unlikely to have changed during that period. Furthermore, it assumed that the full allowance was being

caught for the purpose of calculating revised TACs. Average catch figures for the commercial fishery were drawn from the 2004-05 and 2005-06 fishing year.

- 81 To ensure that the average commercial catch from 2004-05 and 2005-06 fishing years are representative of recent catch, the commercial catch figures for the incomplete 2006-07 fishing year have been updated for the ten month period through to July 2007. A revised 'Table 6' from the IPP is presented below as Table 5 for your information.
- 82 Longfin catch in the current fishing year is unlikely to exceed the average commercial catch in the preceding years. The shortfin catch in SFE 20 and SFE 23 is likely to exceed the average from the preceding years, but not significantly. In contrast, the SFE 21 commercial catch in the current fishing year is unlikely to reach the average for the preceding years. Overall, the TAC options for shortfin or longfin stocks proposed in the IPP are considered to be representative of recent catch through to the current fishing year.

Table 5: Updated Table 6 from Initial Position Paper on commercial catch (in tonnes) of North Island shortfin and longfin eel stocks since the 2004-05 fishing year. Sourced from a Monthly Harvest Return data extract of 22 August 2007. Percentage of TACC remaining uncaught is shown in brackets.

Stock	TACC	2004-05	2005-06	2006-07 (to 30 July)
SFE 20	149	78.41 (47.4)	93.25 (37.4)	96.56 (35.2)
LFE 20	47	27.42 (41.7)	23.74 (49.5)	22.35 (52.5)
SFE 21	163	122.95 (24.6)	144.33 (11.5)	92.36 (43.3)
LFE 21	64	53.52 (16.4)	41.18 (35.7)	25.47 (60.2)
SFE 22	108	80.53 (25.4)	106.90 (1.02)	77.29 (28.4)
LFE 22	41	23.86 (41.8)	31.64 (22.8)	24.82 (39.5)
SFE 23	37	14.95 (59.6)	31.46 (15.0)	29.75 (19.6)
LFE 23	41	24.52 (40.2)	24.19 (41.0)	13.80 (66.3)

Calls for even lower catch limits

- 83 At this time MFish does not consider that more significant adjustments in catch limits for North Island eel stocks should be made beyond the options provided in the IPP. MFish appreciates that some submitters and other fishery interests have not enjoyed satisfactory access to the eel fishery for several years, and the state of the resource is of particular concern across a wide range of areas.
- 84 However, recent changes to management settings (eg, introduction of catch limits, maximum size limit), the current review, and future initiatives are heading in the right direction. MFish will continue to monitor shortfin and longfin stocks in the North Island through research initiatives. Periodic reviews of management settings can be undertaken if the management strategy is not likely to be adequately met in the medium term.

Calls for the status quo, or smaller reductions in catch limit

- 85 MFish does not support an approach where the catch limit settings for either shortfin or longfin are left at their present level while further discussions take place amongst fishery interests and MFish. The present TACs allow for further catch to be taken from the fishery, in an environment where the information suggests more restraint is at least desirable, if not necessary.
- 86 The TAC options proposed in this review do not have significant impacts on the use of most of the various stocks, yet serve to contribute to an improvement in fishery management outcomes for all fishery interests over the medium term. Some industry submitters have offered alternative suggestions for smaller reductions in catch limits for longfin stocks, although the rationale for the alternative catch limits is not necessarily clear.
- 87 MFish has reached its current position having reviewed the current information available for the fishery, together with knowledge of the fishery gathered from fishery interests over several decades. This is the best available information. MFish acknowledges that the level of stock assessment information available at the moment is not sufficient to be more determinative in its management advice on eel stocks. MFish is not able to definitively advise you on the relative probability of rebuild under the different options for TACs. Collection of that information is difficult and time consuming, but efforts continue. This situation only re-enforces the need for the exercise of caution when decisions on sustainability and/or utilisation are required to be made.
- 88 The sources of research information used to reach the MFish view have been canvassed through the MFish Fishery Assessment Working Group process. Several industry representatives consistently attend that Working Group and have actively participated in discussions about interpretation of new research findings. Similarly, a range of fishery interests participate in the Eel Research Planning Group process, and information gaps are discussed. MFish welcomes the participation of a wider range of fishery interests in order that their suggested priorities for research activity are discussed.
- 89 MFish has commissioned a research report focusing on methods to estimate customary catch that should assist in further information collection, and research planning in future years. The research provider was not able to provide a progress report on that project at the August 2007 Research Planning Group meeting.
- 90 MFish reiterates that size grade information from commercial catch landings indicates the size composition of the (commercial) fishery for both shortfin and longfin could be significantly improved. This would have positive implications for utilisation and sustainability outcomes for all stocks. There has not been a clear trend suggesting the average size of shortfin or longfin taken commercially has improved in recent years, even though the existing TACCs have yet to be caught. Similarly, there has been no obvious significant change in the composition of recent commercial catch in terms of the proportion (by weight) of longfin to shortfin, when compared to historical data.
- 91 MFish accepts that it may take time for improvements in terms of average size and species composition to manifest themselves in wild eel populations, particularly in southern populations with slower growth rates. However, positive changes have not been generally evident in more northern locations where growth rates are better and commercial catches, while lower than observed in the 1990s, have not reached catch limits put in place.

Furthermore, any improvements might be further delayed or not happen at all if existing TACs were fully utilised. MFish acknowledges some observations from commercial fishers that improvements in average size have occurred at a local scale since 2004.

- 92 MFish does not accept some industry views that the commercial catch may not be representative of the wild fishery due to a range of factors. Factors such as drought conditions, relative experience of a commercial fisher, and export conditions etc. have been taken into account when considering the commercial catch information. Some of these features are not unique to a particular year, such that it would affect the interpretation of longer term trends.
- 93 In addition, anecdotal observations from non-commercial fishing interests generally suggest that the wild fishery is in an unsatisfactory condition. This is consistent with research findings. This view is shared by some experienced commercial fishers actively involved in the fishing of the resource, although other industry representatives may disagree.

Assessment of Management Options

Total Allowable Catch

Hauraki Gulf Marine Park Act 2000

Legislative provisions

- 94 Before setting any sustainability measure, such as a TAC, relevant to the Hauraki Gulf 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 in so far as the decision relates to the Hauraki Gulf. The four fishstocks SFE 20, LFE 20, SFE 21 and LFE 21 are relevant to the Hauraki Gulf.
- 95 The Hauraki Gulf is defined in the abovementioned Act to include all coastal waters and offshore island from just south of Mangawhai, offshore to the Moho Hinau Islands, and south to Homunga Point (north of Waihi Beach). That Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. Importantly for eels, sections 7 and 8 also apply to catchments flowing into the Hauraki Gulf.
- 96 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.
- 97 Section 8 sets out the objectives of the management of the Hauraki Gulf, which includes the maintenance of the Hauraki Gulf for social and economic wellbeing 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 includes shortfin and longfin stocks, is also an objective.

Analysis

- 98 Shortfin and longfin eels are found throughout the waters of the catchments leading into the Hauraki Gulf, and in some areas form a component of the estuarine and marine food web. Shortfins in particular are known to be commercially fished mainly in the Firth of Thames

at the river mouths and shallow coastal margins, as well as embayments of the Waitemata Harbour.

- 99 Both shortfin and longfin eels are found in the many estuarine waters that make up the fractured eastern coastline, and are well known to occur in streams and rivers of urban areas, as well as more natural settings of more forested areas (eg, Hunua ranges, or Coromandel Peninsula). The fishery on the Coromandel Peninsula supported a commercial fishery of about 10 tonnes per annum during the 2003-04 and 2004-05 fishing years (both species combined).
- 100 The main river systems leading into the Firth of Thames drain many of the remaining wetland areas of the Hauraki Plains, and these areas are known to be commercially fished for shortfin in particular. Data from the 2003-04 and 2004-05 fishing years suggest that the most important area for commercial harvest of principally shortfin is the Piako River catchment and adjacent streams/wetlands. Catch of eels in this area was approximately 25 tonnes per annum, with ~80% of the catch being shortfin. The Waihou River, its tributaries, and adjacent wetlands are well used by commercial eel fishers. Commercial catch, of mainly shortfin, is approximately 15 tonnes per annum.
- 101 The commercial fishery for eels in the catchments of the Hauraki Gulf is relatively important on a local scale, particularly in the rivers and wetlands of the Hauraki Plains. However, its contribution to the eel industry at a national scale is of less significance. The commercial fishery in the Waikato and Northland is of more significance on a national basis.
- 102 Some non-commercial fishing activity occurs on the Hauraki Plains. Reports from whānau involved with the customary fishery note that they now have to travel a greater distance to reach suitable fishing areas. This may involve gaining access to waters through other people's land. Tangata whenua from this area observe their social and cultural aspirations are not being adequately met. They believe eel populations are depleted, and catch rates are relatively low in comparison to catches in the 1960s.
- 103 MFish considers that the proposals within this final advice will further contribute to the social, cultural and economic well-being of people having an interest in shortfin and longfin populations of Hauraki Gulf waters. There is a need to maintain the status of the resource, and to improve it, in order that the values encompassed in the Hauraki Gulf Marine Park Act are enhanced for the longer term. The value that non-commercial interests have previously enjoyed in the Gulf is not adequately being met. Similarly, commercial fishers could improve their economic well-being where sustainability and utilisation outcomes are improved within the area.

General observations on varying the TACs

- 104 MFish is of the view that it is still appropriate to manage the stocks under section 14 for the short to medium term. To better serve the purpose of the Act under section 14 the previous Minister agreed to a management strategy to guide the setting of TACs.
- 105 Other than some views from the fishing industry, all fishery interests support a reduction to TACs for shortfin and longfin stocks in the North Island. Of those non-commercial submitters to offer a view on the MFish options for TACs, none of them indicated that shortfin option 1 or longfin option 1 represented sufficient reductions.

- 106 Industry submitters generally wish to engage in a broader review of management measures at a range of levels, and suggest that a review of catch limits for North Island eel stocks is not urgent, particularly for shortfins. MFish considers there is value in a more comprehensive review, but this will require significant time and resources to complete. MFish does not consider it appropriate to retain the current management settings while future discussions on the management outcomes take place over the next few years. Active steps are required to ensure that sustainability risks are reduced and, from an utilisation perspective, the fishery rebuilt within a reasonable timeframe.
- 107 Some commercial submitters suggest that MFish needs to rethink its approach to management of the eel fishery. MFish is well aware of the desirability to address or further refine the management framework for eel fisheries on a national basis. MFish is taking steps to work with fishery interests to address these as required, and as other priorities allow.
- 108 In the meantime, the present review seeks to reduce sustainability risks and improve utilisation opportunities in a rebuilt fishery, while initiatives are progressed over the medium term. TAC reduction proposals are unlikely to be in conflict with future initiatives that may be developed to complement catch limit controls. Effecting a TAC change is a relatively straight forward step to take from an administrative perspective. Should a reduction in TACs result from this review, MFish believes the effect of the change will be beneficial for the fishery and the aquatic environment in the medium term. That outcome is not inconsistent with commercial aspirations in terms of well-being over that time period.

Northland / Auckland (QMA 20)

SFE 20

- 109 The shortfin fishery in the upper North Island is characterised by a significant portion of relatively small eels. A significant improvement in the size structure of the shortfin population has not been broadly apparent in commercial landings, and non-commercial interests in the area have concerns for the size and quantity of eels found in the stock. The warmer water temperatures in the area are likely to encourage faster growth, yet improvements over recent years are not yet obvious across the stock.
- 110 EEC0 indicates that some reduction of (commercial) catch could be made if reductions need to be made now, but the rationale for the suggested reduction is not explained – it could simply be that there is more ‘headroom’ for a reduction to be made. The reduction proposed by EEC0 equates to 15% of the existing TACC. In the context of how that kind of reduction might be derived, a TAC would need to be varied in accordance with an approach similar to shortfin option 1. In contrast, tangata whenua from the area believe that more significant reductions to the TAC are required, at or beyond the approach suggested by shortfin option 2.
- 111 Reducing the TAC using shortfin option 1 may not necessarily contribute to a significant rebuild of the stock. This would result in a reduction of the TAC from 211 tonnes to 179 tonnes. The benefits of this reduced TAC may be more modest than a TAC varied to a lower level. However, any such benefits that arise would be at relatively little cost to the existing use of the resource.

112 MFish believes that shortfin option 2 is more appropriate. A rebuild in the stock would be more likely to be evident under this approach. Accordingly, the TAC would be reduced from its existing level of 211 tonnes to 148 tonnes.

LFE 20

113 The longfin fishery of the upper North Island has been heavily fished, and fishery interests generally recognise that there are concerns about the status of longfin throughout the country, as well as at a stock level. The size composition of the LFE 20 stock is dominated by relatively small sized longfins, and there is a need to improve the size structure within the stock. Preliminary harvest estimates for the LFE 20 stock suggest that exploitation levels have been too high in the past, and a more conservative approach is required.

114 Reducing the TAC using longfin option 1 (to a level at or about recent catch) is unlikely to ensure sustainability, or make significant gains on the rebuild of the stock. EECo supports a reduction in (commercial) catch taken from the stock in recognition of the concerns for longfin generally. EECo envisages a TACC of 33 tonnes, representing a 30% reduction from the existing TACC of 47 tonnes. However, recent commercial use of the stock has not reached this level, nor is it likely to in the current fishing year.

115 In the context of the TAC, a significant reduction in longfin catch is warranted, consistent with the assessment of longfin status generally, but also bearing in mind that the LFE 20 stock requires rebuilding. MFish does not believe that adopting longfin option 1 for the varying of the TAC is particularly viable in terms of ensuring sustainability. This would reduce the existing TAC from 67 tonnes to 45 tonnes. More active steps are required to arrest sustainability risks for longfin stocks. MFish recommends that the TAC is varied in accordance with longfin option 2, such that it is reduced from 67 tonnes to 39 tonnes.

Waikato / Poverty Bay (QMA 21)

SFE 21

116 The SFE 21 stock has been well utilised by fishery interests over a long time period. There has been extensive commercial use of the fishery in recent decades. The stock is considered heavily fished, although there are some areas where fishing has been relatively light. Some recent improvements in average size have been observed on a local scale in some areas. However, commercial landings provide evidence that the population structures have been significantly affected in comparison to historic catches in the earlier part of the commercial fishery. Non-commercial interests indicate that their harvesting expectations are not being met, when compared to catches of earlier times.

117 EECo indicate that some reduction in (commercial) catch is warranted (14 tonnes), equating to about 9% of the TACC. In the context of the TAC proposals, and the need to achieve a rebuild of the stock, this is unlikely to be of much value. This stock requires rebuilding. Reducing the TAC to a level some way above existing catch still provides for more catch to be taken.

118 At this stage, it is uncertain whether the downward trend in the SFE 21 commercial catch this fishing year represents an actual further downward trend in the wild fishery. Some commercial fishers observe that the average size in some local areas is improving, while others indicate a contrary view for other areas of the stock. Overall, some caution seems

appropriate. Adopting a TAC using shortfin option 1 may not be cautious enough. This would reduce the TAC from 210 tonnes to 195 tonnes.

- 119 MFish considers that varying the TAC using shortfin option 2 (at or about recent catch) would be desirable, and would provide more certainty that sustainability risks are reduced, and allow the stock to rebuild with more certainty. The TAC would be reduced from 210 tonnes to 181 tonnes under this approach. A rebuild in this stock could generate improved catching success, and reduce costs in undertaking fishing operations. The attainment of these benefits for this stock in particular would outweigh short term costs associated with reduced catch.

LFE 21

- 120 The longfin fishery in the upper North Island is considered heavily fished. The proportion of longfins in the commercial fishery (compared to shortfin) has significantly reduced. The Waikato, King Country and Hauraki areas were well known longfin fisheries in former times. Indicators of the state of the LFE 21 resource are of particular concern, and suggest that a cautious approach to management settings is required. The commercial catch of LFE 21 in the current fishing year has not reached the level of the preceding fishing years. External influences such as market conditions or environmental variables during the current fishing year are unlikely to have been responsible for the lower commercial catch in this stock.
- 121 EECO suggests that some reduction in (commercial) catch is warranted to mitigate any sustainability risk. EECO suggest that the TACC could be reduced from 64 tonnes to 49 tonnes (ie, by 23%). Non-commercial interests indicate that the reduction should be at least in the order of longfin option 2 as suggested by MFish.
- 122 MFish does not believe that adopting longfin option 1 for the varying of the TAC is particularly viable in terms of reducing sustainability risks. This would reduce the existing TAC from 92 tonnes to 75 tonnes. More active steps are required to arrest sustainability risks for longfin stocks, and to allow for a rebuild. MFish recommends that the TAC is varied using longfin option 2, such that it is reduced from 92 tonnes to 60 tonnes.

Hawke Bay / Wellington (QMA 22)

SFE 22

- 123 The SFE 22 stock continues to be fished by the commercial sector to levels near the TACC. However, customary interests observe that the condition of the fishery is of concern. The SFE 22 stock is the only North Island shortfin stock that showed a significant reduction in the CPUE index between 1990 and 2002. In addition, data from one of the processing factories showed evidence of a longer term decline in the average size of shortfin eels.
- 124 Customary interests seek some certainty that improvements in the stock will be evident in the future, and therefore support reducing the TAC by more than that proposed by shortfin option 2. These interests are concerned about the uncertainty surrounding the setting of TACs in this QMA in 2004, mainly as a result of the accuracy of the commercial catch information provided to MFish. Industry submissions do not provide any specific comments about the SFE 22 stock, but suggest more generally that no reduction to shortfin stock TACs are warranted at this time.

- 125 In contrast to other stocks, the options for TACs for SFE 22 in this review are relatively close to the existing TAC. This is a function of the use of the fishery in recent years. Nevertheless, it is not evident that utilisation outcomes are being achieved by all sectors with the desired certainty at the current TAC, or likely to be achieved under shortfin option 1. Nevertheless, it is possible that at least the commercial sector is meeting its catch requirements.
- 126 MFish considers that varying the TAC using shortfin option 2 (at or about recent catch) would be desirable. Of the two options, this provides a more significant reduction in catch, and may better enable a rebuild in the stock. The TAC would be reduced from 135 tonnes to 121 tonnes. On-going monitoring of fishery indicators will enable better assessment of any improvements.

LFE 22

- 127 Customary interests express considerable concern about the state of longfin populations within the LFE 22 stock, to the extent that closure of the fishery is suggested as a viable approach. These interests note that there are concerns about the size, distribution and abundance of the resource. These concerns extend to significant depletion in some areas.
- 128 EECO suggests that some reduction in (commercial) catch is warranted to mitigate any sustainability risk. EECO suggests the TACC could be reduced from 41 tonnes to 29 tonnes (ie, by 29%).
- 129 In the context of the TAC, a significant reduction in longfin catch is warranted, consistent with the assessment of longfin status generally, but also bearing in mind that the LFE 22 stock requires rebuilding. The average size of longfin in commercial catch from LFE 22 may be better than longfin stocks in the upper North Island, but slower growth rates in more southern latitudes suggests a more conservative catch level is required.
- 130 MFish does not believe that adopting longfin option 1 for the varying of the TAC will achieve a reduction in sustainability risks, and achieve some progress on rebuilding the stock. This would reduce the existing TAC from 54 tonnes to 41 tonnes. More active steps are required to arrest sustainability risks for longfin stocks. MFish recommends that the TAC is varied using longfin option 2, such that it is reduced from 54 tonnes to 34 tonnes.

Taranaki / Rangitikei (QMA 23)

SFE 23

- 131 Customary interests have previously indicated their strong concerns about the state of the eel fishery in this area, and these concerns are still evident. The QMA is well known for the presence of longfin rather than shortfin. Customary interests from this area that attended hui held during the consultation period support the general direction of ensuring the resource is sustainably managed. They support reductions in catch as one means to improve the status of the fishery.
- 132 EECO believes that no reduction in (commercial) catch from this stock is necessary at this time. There has been an increase in the commercial use of the SFE 23 stock in the current fishing year. This is likely to be as a result of some key commercial fishers leaving the fishery in the previous year, and newer participants entering the fishery. MFish notes that,

in comparison to other quota management areas, there were few overall participants in the Taranaki / Rangitikei area over recent years, and changes in participants is more likely to have affected trends of commercial catch.

- 133 Given the concerns expressed by tangata whenua about the availability of eels across the stock, and the need to improve the size structure of shortfin populations from this stock, a reduction in the TAC is desirable. Under shortfin option 1 the TAC would be reduced from 50 tonnes to 43 tonnes. This represents a reasonable reduction in the short term, when considering the prospects for improvement in the stock relative to the desired longer term use of the stock, and the comparably low level of catch permitted relative to other shortfin stocks.
- 134 However, MFish considers that varying the TAC using shortfin option 2 (at or about recent catch) would enable a rebuild to occur with greater certainty. This approach is further justified in recognising the likelihood of slower growth rates prevailing in more southern latitudes of the North Island. The TAC would be reduced from 50 tonnes to 36 tonnes under this approach. There are more significant implications for users of the resource under this TAC option.

LFE 23

- 135 Customary interests have previously indicated their strong concerns about the state of the eel fishery in this area, and these concerns are still evident. The QMA is well known for the presence of longfin. Customary interests from this area attending hui held during the consultation period support the general direction of ensuring the resource is sustainably managed. They support reductions in catch as one means to improve the status of the fishery.
- 136 EECo suggests that some reduction in (commercial) catch is warranted to mitigate any sustainability risk. EECo suggests the TACC could be reduced from 41 tonnes to 24 tonnes (ie, by 41%).
- 137 In the context of the TAC, a significant reduction in longfin catch is warranted, consistent with the assessment of longfin status generally, but also bearing in mind that the LFE 23 stock requires rebuilding. The average size of longfin in commercial catch from LFE 23 may be better than longfin stocks in the upper North Island, but slower growth rates in more southern latitudes suggests a more conservative catch level is required. Further, the dominance of the longfin species in eel populations of the area could be affected if shortfins became increasingly abundant relative to longfin. MFish notes that the closure of much of the Whanganui River catchment in 2004-05 did not result in the displacement of commercial fishers, or affect the recent catch of longfin.
- 138 MFish does not consider that adopting longfin option 1 for the varying of the TAC is sufficient. This would reduce the existing TAC from 66 tonnes to 41 tonnes. More active steps are required to reduce the sustainability risks, and help rebuild the stock.
- 139 MFish recommends that the TAC is varied using longfin option 2, such that it is reduced from 66 tonnes to 34 tonnes. MFish considers that the sustainability benefits of reducing the TAC for longfin in accordance with longfin option 2 outweigh the short term costs, let alone the longer term consequences if action is not taken.

Allowance for customary fishing purposes

- 140 The majority of submitters support the retention of the existing allowance for customary fishing interests. Submissions from tangata whenua highlight the importance of eel for the exercise of customary practices, including the provision of eels for marae functions.
- 141 MFish reiterates there is an on-going obligation under the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 to give recognition to the use and management practices of Maori in the exercise of non-commercial fishing rights. In view of these obligations, MFish recommends that customary harvest for eels be provided for in full when allowing for customary fishing.
- 142 Some submitters highlight that the Fisheries (Kaimoana Customary Fishing) Regulations 1998 do not yet apply to freshwater fisheries in the North Island. One concern is that customary authorisations issued under regulation 27/27A of the Fisheries (Amateur Fishing) Regulations 1998 do not result in reports on what was actually taken under the authorisation. SeaFIC questions how statutory obligations to customary Maori interests are assured if the Crown has no information on customary catch.
- 143 At present, eels may only be taken from the freshwater environment of the North Island for limited customary purposes (ie, hui, tangi) in accordance with regulation 27/27A of the Fisheries (Amateur Fishing) Regulations 1986. There is no statutory requirement for kaitiaki to report on their use of this regulatory authority.
- 144 MFish have been discussing the desirability of applying the Fisheries (Kaimoana Customary Fishing) Regulations 1998 to freshwater environments of the North and Chatham Islands with a variety of hapu and iwi. This would provide hapu and iwi with a greater range of options for authorising customary management practices.
- 145 On 7 August 2007 you approved an approach where MFish can now formally consult with interested parties on this matter. In this regard, a letter was sent to fishery interests on 29 August 2007. Should the Fisheries (Kaimoana Customary Fishing) Regulations 1998 be changed in the near future, it will allow for better information to be collected on the use of fisheries resources for customary Maori purposes. MFish considers that it will be some time before the full suite of measures provided by customary regulations can be implemented. It would be premature to alter the current allowances for customary fishing purposes at this time.
- 146 MFish recommends that the customary allowances are retained at existing levels. The benefits of this approach are that it will provide some continuity in management arrangements while broader regulatory reforms for customary fishing are discussed.

Allowance for recreational fishing purposes

General observations

Consideration of non-commercial views

- 147 The majority of non-commercial interests support a non-proportional approach to the varying of allowances. Various reasons are provided for this approach. These include the contribution that recreational eeling provides to healthy lifestyles and social well-being, and

the intended outcome of the management strategy to improve the availability of eels to non-commercial interests.

- 148 Some customary interests suggest that it would be premature to change recreational allowances until better information on the impact of recreational fishing on the fishery is available. More generally, MFish accepts that further information on the nature and extent of the recreational use of eel stocks would be beneficial. This would make any future management intervention (if any) more meaningful.
- 149 The recreational allowance was set in 2004 at a level below recreational catch estimates. Some recreational interests observe that a further reduction would not be in keeping with the statutory obligation in the Act to ‘allow for’ non-commercial interests in the eel fishery. Similarly, recreational interests do not agree with the implementation of other measures to control recreational catch where this would be inconsistent with statutory obligations and the stated intention of the management strategy (ie, to improve the fishery’s availability to non-commercial fishers).
- 150 MFish understands this point of view, but also observes that improved availability of eels to the non-commercial sector could be interpreted in a number of ways. For example, the availability of eels may be improved if the average size in the eel population was increased, even though allowances for the overall stock were not changed. Nevertheless, MFish is aware that the non-commercial use of the resource has been significantly reduced from former times in each of the stocks, and generic improvements for these interests are justifiable.
- 151 Further, one recreational interest group considers that MFish has failed to address sustainability issues, and it is not appropriate for tangata whenua to implement customary measures to ensure allowances are not exceeded. This observation recognises that Maori can use customary practices to manage both customary and recreational take. The inference is that this group believes that it should not have to act to control its own activities, where sustainability issues should have been dealt with by MFish.
- 152 MFish considers that it has taken steps to ensure sustainability. The introduction of the eel fishery into the QMS, and the subsequent review of catch limits, seeks to address sustainability concerns held for the fishery. MFish notes that it, and its predecessor, has advocated the introduction of the eel fishery into the QMS since the mid 1980s. Prior to QMS introduction, access restrictions were applied to the commercial fishery, and a daily bag limit applied to recreational fishers. The decisions of the previous Minister in 2004, and the outcome of the present review, should encourage fishery interests to look to the future, and to find common ground with other interests about how the fishery should be managed.
- 153 One recreational interest group observes that there is a disparity between the allowances for customary and recreational fishing interests, and suggests that a review of the recreational allowance should be undertaken. The inference is that the recreational allowance should be increased as Maori undertake most of their eel fishing activities under the recreational allowance at this time. MFish believes a review of the recreational allowance on this basis would be premature as an amendment to the Fisheries (Kaimoana Customary Fishing) Regulations 1998 is presently being discussed.

- 154 One customary group suggests that the recreational allowance should be reduced on a proportional basis for both shortfin and longfin stocks. The group concerned observes they are already making a sacrifice of their recreational and commercial interests in the stocks. MFish is aware that the customary group in question is concerned about the state of the eel fishery in QMA 22 (Hawke Bay/Wellington), and they are looking at ways of contributing to the improvement in the status of the stocks.
- 155 MFish considers that the contribution that a reduction in recreational allowance would make in QMA 22 is not significant in the overall reduction made from the TACs. For shortfin, the difference between proportional and non-proportional approaches works out at 1 tonne, and for longfin, the difference would be either 1 or 2 tonnes. MFish does not consider that this difference is sufficiently large to warrant application of the proportional approach. However, MFish appreciates that the customary group in question is voluntarily reducing its fishing activities for recreational purposes, and that it is willing to take its own initiatives to help the rebuild of the stocks.

Consideration of commercial views

- 156 The fishing industry (SeaFIC) presents a range of reasons why it does not support a non-proportional approach to allocation. It argues that MFish's final advice in 2004 stated that further adjustments in allowances would require evaluation of the recreational use of the eel resource, and that in the absence of additional information, MFish should retain a proportional approach to allowances in this fishery. MFish considers that its proposals to retain the existing recreational allowances are not inconsistent with its previous position. Obtaining further recreational catch information is highly desirable. However, it is probably not feasible to expect such information to be collected to a reasonable degree of accuracy, and within a reasonable cost, in the short to medium term.
- 157 MFish does not necessarily accept the argument that estimates of relative value are not a valid basis for allocation decisions under the Act. Estimates or measures of value are likely to translate into an assessment of social, cultural and economic well-being, if they are not interpreted as being one and the same in the first instance. In essence, one's well-being is likely to be enriched if the values associated with the fishery, and the variety of its uses, are recognised and provided for.
- 158 SeaFIC argues that recreational catch was not reduced in 2004, even though the proportional approach to the setting of the original recreational allowance and TACCs was applied. SeaFIC hold this view because measures were not applied that would have potentially resulted in a reduction of recreational catch. Given this, it does not believe that further 'non-proportional' reductions to TACCs are justified. MFish notes however, that at the time, and prior to 2004, there was some evidence that the recreational sector had shown some self-restraint in undertaking eel fishing (eg, rāhui). As such, further measures to restrain recreational catch were not considered appropriate at the time.
- 159 In addition, the introduction of a daily bag limit in the mid-1990s may have provided an indirect constraint on recreational catch. There were several non-commercial fishery interests who were disappointed to learn that they could no longer take catches in excess of six eels on a recreational basis. This issue has been raised at a number of hui during the 1990s through to recent times. MFish considers that the justification for a non-proportional approach to allocation at this stage is reasonable.

- 160 A further argument is that the management strategy currently in place has not been confirmed by the current Minister, nor by all users through a fishery plan process. MFish seeks your confirmation of the current management strategy as one of the recommendations in this review. The fisheries planning process will provide a better basis for setting out management objectives in the future.
- 161 SeaFIC believes that the analysis of impacts of TAC/TACC reductions is limited, and that MFish need to consider the longer term consequences of increasing the proportion of non-commercial catch of eels. MFish advised in 2004 that the initial management settings for the North Island eel fishery were a reasonable starting point, noting that management measures would be progressively refined. For example, new information that more accurately accounts for the recent use of the non-commercial fishery might adjust the initial allowances set. Similarly, the extent of non-commercial catch, and whether it is appropriately classed as recreational or customary catch, will be a feature of further analysis if there is a change in the application of customary fisheries regulations in the North and Chatham Islands.
- 162 SeaFIC is concerned that if non-commercial interests represent a larger proportion of a stock, then there is a greater risk that the TAC could be exceeded, if monitoring of the catch from these interests is not improved. MFish does not consider it appropriate to shy away from a recommendation to retain an allowance where this might give rise to a greater proportion of the fishery being unmonitored, and generating uncertainty for future TACs. More appropriately, if a decision was made to increase an allowance on the basis of better well-being and other relevant considerations, then the consequence of that would be to ensure that steps were taken (where possible) to better assess the use of that allowance.
- 163 MFish accepts that the monitoring of non-commercial catch is usually difficult, and will require on-going investment of resources. The non-commercial use of eels presents some additional challenges that are not apparent with marine species. MFish has identified the collection of such information in its Medium Term Research Plans, and will continue to investigate other avenues where this information can be obtained.

Recommendation on allowance for recreational interests

- 164 On balance, MFish considers the current allowances for recreational interests for the eight eel stocks of the North Island should be retained, and a non-proportional approach adopted. In a quantitative sense, the difference in the recreational allowance using proportional and non-proportional options is typically a few tonnes only for each stock (see Tables 1-4). The effect of applying a non-proportional approach to the decisions on recreational allowance is generally of little consequence to the decisions on the TACC. MFish notes that if you believe that social, economic and cultural values are enhanced through a proportional reduction in allowances then you should adopt that proportional approach when determining allowances.
- 165 Further, existing TACCs have not been fully utilised in recent years, other than perhaps SFE 22 in the 2005-06 fishing year. Therefore, the full range of social, cultural and economic benefits derived from the commercial use of most stocks has not eventuated. Maintaining existing recreational allowances do not significantly affect the resulting recommendations for TACCs, or the current benefits derived in terms of well-being of the commercial sector.

- 166 MFish considers it would be more beneficial for each of the stocks to gather further information on:
- a) the relative scale of recreational catch (noting that obtaining accurate information will be difficult);
 - b) the aspirations of the recreational sector in terms of well-being derived from use of the resource; and
 - c) what measures might be appropriate to apply to the sector in any future management reviews to ensure sustainable use.

Allowance for other sources of fishing related mortality

- 167 MFish recommends that the existing allowances for other sources of fishing related mortality be retained for all North Island eel stocks.
- 168 One submitter is concerned about mortality of eels as they attempt to migrate past hydro-electric power stations, or any 'trap and transfer' programme implemented at these sites. While the mortality of eels associated with natural migration past dams is a valid concern, it is not a matter relevant to this allowance.
- 169 This allowance relates to all known fishing related mortality including illegal fishing such as blackmarket poaching, exceeding amateur bag limits or gear restrictions, illegal commercial fishing, mortality associated with holding bags etc. While a relevant consideration, MFish does not consider that the mortality of juveniles during trap and transfer fishing activities is significant. MFish has conditions on special permits authorising these activities for the permit holder to report on such matters. The juvenile eels reaching dams would die in the absence of these initiatives.
- 170 Where non-fishing activities affect a stock, this would be a relevant consideration to take into account when setting a TAC. For example, the drainage of wetlands and removal of aquatic vegetation may have an impact on the biomass of the eel stock of interest.

Total Allowable Commercial Catch

General observations

- 171 Your powers for setting and varying the TACC are exercised under section 20 of the Act. Allowances for Maori non-commercial fishing interests, recreational interests and all other mortality caused by fishing are set under section 21. In setting the allowances and the TACC you are required to consider the social, economic and cultural well-being of the persons in each sector.
- 172 Customary, recreational and environmental interests strongly support reductions to the TACCs. Commercial interests only support reductions to longfin TACCs, but not to the extent envisaged by MFish. Significant reductions are sought by MFish so that the rebuild of shortfin and longfin stocks is evident in future years, as well as recognising the need for caution. Recreational interests observe that the current TACCs are not acting as a constraint on commercial catch in all but one stock during the 2005-06 fishing year (SFE 22). Recreational interests wish to see TACCs varied to levels below actual catch in order that a rebuild can take effect.

- 173 The TACCs reflect the portion of the TAC that commercial fishers can use. The proposed TACCs, if agreed, will result in less commercial catch than previously allowed. While the difference between the existing TACCs and proposed TACCs appear large, it is important to appreciate that TACCs have been well under-caught for most stocks. You will need to consider the relative costs and benefits of the proposed TACCs relative to their impact on social, cultural and economic well-being.
- 174 The economic effects of reducing TACCs will be of more consequence where these are varied to levels below recent commercial catch. The IPP provided an analysis of the financial effects of the proposed reductions in terms of potential economic loss at the stock level, should TACCs be varied to levels lower than average recent commercial catch. The Table with these figures is reproduced in this final advice paper as Table 6.
- 175 The figures produced in the last column of Table 6 that follow represent the financial impacts should the smallest TACC option be chosen for a stock, when compared to the average commercial catch taken in the 2004-05 and 2005-06 fishing years. Should you decide to pursue a less conservative TAC and TACC for a stock, the financial impact will be lower. The immediate impacts are only of significant consequence for longfin stocks. For shortfin stocks, there is little or no impact, as similar levels of harvest are available with the recommended TACCs. Some more specific comments on the impacts of TACC reductions and their relative costs and benefits follow in each of the stock sections. Consideration is also made to trends in commercial catch in the current fishing year, as updated in Table 5.

Table 6: Potential economic loss (\$) for North Island eel stocks using port price and export price, where proposed TACCs are reduced below actual average commercial catch (based on catch in 2004-05 and 2005-06 fishing years).

Stock	Range in TACC reduction (t) from prior levels	Port Price (\$/kg)	Export Price (\$/kg)	Potential economic loss (\$) based on TACC reduction from actual average commercial catch using port price and export price (actual tonnage reduction in brackets)
SFE 20	27 - 63	3.87	8.37	\$0 (0)
LFE 20	19 - 28	3.88	8.37	\$27,160 - \$58,590 (7)
SFE 21	14 - 29	3.87	8.37	\$0 (0)
LFE 21	15 - 32	3.88	8.37	\$58,200 – \$125,550 (15)
SFE 22	6 - 14	3.87	8.37	\$0 (0)
LFE 22	12 - 20	3.88	8.37	\$23,280 – \$50,220 (6)
SFE 23	6 - 14	3.87	8.37	\$0 (0)
LFE 23	21-32	3.88	8.37	\$58,200 - \$125,550 (15)

- 176 In response to the comment that existing TACCs are not constraining catch, MFish believes it is fair to observe that existing commercial catch is reduced from catch experienced prior

to the application of catch limits under the QMS. However, it accepts that the existing TACCs provide opportunity for further commercial catch that may not be in the best interests of the relevant stock.

- 177 MFish appreciates that EEC0 has looked to offer alternative options for TACC reductions. However, MFish does not consider the suggested alternatives are sufficient to provide the improvements in fishery performance that the North Island eel industry and others are looking for over the medium term. Some of EEC0's proposed TACCs could result in further increases in commercial catch. The scope for increased commercial catch might provide a short term economic benefit, but may also come at a longer term cost. Any future TACC reduction required could give rise to more economic impacts to commercial fishers than at present.
- 178 A relatively large percentage of the TACCs for North Island eel stocks has not been used in recent years (other than in the SFE 22 stock for the 2005-06 fishing year). Accordingly, there will still be a reasonable amount of scope for commercial fishers to maintain viable operations should TACCs be reduced to levels of recent use. As commercial eel fishers are sometimes involved in other industries (eg, hunting), or pursue eel fishing as a seasonal or part-time business, MFish believes the industry will be able to adjust its operations to any reduced TACC levels without significant disruption.
- 179 MFish notes that eel processing facilities have continued to operate at lower tonnages in recent years, and no concerns about their viability were expressed through the submission process.

Northland / Auckland (QMA 20)

- 180 One customary submitter suggested the commercial fishery should be closed for two years in the Far North. MFish notes that the quantity of commercial fishing in the Far North (Te Hiku o Te Ika) is not significant in the overall context of the SFE 20 and LFE 20 stock. With reduced TACCs recommended for the SFE 20 and LFE 20 stocks, it may be that some of the concerns can be allayed, at least as they relate to potential commercial fishing impacts.
- 181 MFish recommends that the TACC for SFE 20 should be set using shortfin option 2 (at or about recent catch), using a non-proportional approach. The varied TACC recommended is 86 tonnes. This would have the effect of a slight decrease in commercial catch, based on catch made in 2005-06, and landings from the current fishing year (see Table 5).
- 182 MFish recommends that the TACC for LFE 20 should be set using longfin option 2 (at or about 20% below recent catch), using a non-proportional approach. The varied TACC recommended is 19 tonnes. This would have the effect of a slight decrease in commercial catch, based on catch made in 2005-06, and landings from the current fishing year (see Table 5).

Waikato / Poverty Bay (QMA 21)

- 183 MFish acknowledges that customary interests seek significant reductions in commercial catch from the Waikato part of the QMA 21 area. Industry members also seek stock improvements, and recognise that eel stocks in this QMA have been extensively fished. Some commercial fishers have indicated that some improvements in average size (both

species) in some localities are evident since 2004, although MFish considers that general improvements are required across the full extent of the stock.

- 184 TKOTAW queries whether compensation is available to offset the loss of commercial activity for eels. MFish notes that fisheries legislation provides that compensation is not able to be claimed for decisions arising from measures to ensure sustainability. If a TACC for a stock is increased in the future, then quota share holders automatically benefit from that, without payment to the Crown.
- 185 MFish recommends that the TACC for SFE 21 should be set using shortfin option 2 (at or about recent catch), using a non-proportional approach. The varied TACC recommended is 134 tonnes. This catch level would allow for higher catches than experienced in the current fishing year, but would be a slight reduction on commercial catch from the stock in the 2005-06 fishing year (see Table 5).
- 186 MFish recommends that the TACC for LFE 21 should be set using longfin option 2 (at or about 20% below recent catch), using a non-proportional approach. The varied TACC recommended is 32 tonnes. This would provide a reduction from catch levels experienced in 2005-06, but would still be higher than catch levels experienced in the current fishing year (see Table 5).

Hawke Bay / Wellington (QMA 22)

- 187 MFish recommends that the TACC for SFE 22 should be set using shortfin option 2 (at or about recent catch), using a non-proportional approach. The varied TACC recommended is 94 tonnes. This catch level is slightly less than that experienced in the 2005-06 fishing year, but more than taken in the current fishing year (see Table 5).
- 188 MFish recommends that the TACC for LFE 22 should be set using longfin option 2 (at or about 20% below recent catch), using a non-proportional approach. The varied TACC recommended is 21 tonnes. This is less than the catch levels experienced in recent fishing years (see Table 5).

Taranaki / Rangitikei (QMA 23)

- 189 MFish recommends that the TACC for SFE 23 should be set using shortfin option 2 (at or about recent catch), using a non-proportional approach. The varied TACC recommended is 23 tonnes. This catch level is less than the catch made in the 2005-06 fishing year, and the current fishing year.
- 190 MFish recommends that the TACC for LFE 23 should be set using longfin option 2 (at or about 20% below recent catch), using a non-proportional approach. The varied TACC recommended is 9 tonnes. This catch level is significantly less than catch made in recent fishing years.

Statutory Considerations

- 191 A discussion of the statutory considerations pertinent to the final advice paper is contained at the end of this paper.

Other Management Issues

Future review of catch limits

192 Conservation interests suggest that the catch limits should be reviewed in the future. MFish intends to undertake periodic reviews of the performance of the fishery, and the indicators of its status. Commercial catch and research information is collected each year which can be incorporated into an evaluation of management needs, or assessed against the management strategy. In addition, initiatives other than catch limit reviews may be undertaken. Further development of management objectives through the fisheries plan process will enable the best mix of tools to be applied to the fishery.

Geographic scale of reporting commercial catch

193 There is a desire to record commercial catch to a finer scale than presently provided for in statutory returns. MFish has commissioned research over the last two or three years to better understand the distribution of commercial catch at a more useful scale. If this research assists in demonstrating that fine scale reporting is useful, methods will need to be explored that allow this kind of reporting through the normal statutory process.

Harvest management

194 Submitters raise a number of other suggestions about how mainly commercial fishing should be carried out, including a focus on the fishing of waterways where downstream migration is blocked, and such waters are stocked with juvenile eels. The commercial sector already fishes some catchments in this way, and stocks them accordingly once appropriate statutory authority is received. However, it is also important to ensure that downstream passage past such blockages is addressed for the longer term.

195 A further submission suggests the taking of eels in a migratory condition should be prohibited. Eels undertaking their spawning run typically are referred to as silver eels given their colour. Eels in such a condition do not eat, and are less likely to be captured. Commercial fishers in the North Island have undertaken not to land any silver eels if caught, and return them to the water. MFish has not verified the success of this undertaking beyond periodic verbal assurances from key North Island industry representatives (as recently as August 2007). More generally, it is not known whether this practice is carried out in the South and Chatham Islands.

196 The recent application of the 4 kg maximum size limit in the North and Chatham Islands from April 2007, will ensure that larger eels are returned to the water in the first instance. Submitters suggest that the current practice of commercial fishers in the North Island voluntarily returning adults eels in migratory condition should be regulated more generally. This suggestion should be further discussed in the context of practices in other parts of the country, and any refinements to other sustainability measures that may address maximising spawning escapement.

197 One submitter suggests that spawning escapement could be maximised by a closure of fishing (except customary fishing) between mid-February and the end of May. To close fishing in this period assumes that eels in migratory condition are being caught. That may not be the case, or at least in any number. Similarly, a seasonal closure would disrupt the fishing opportunities for eels that are not in migratory condition. At this time MFish does

not consider that a seasonal closure is the best way to address the maximisation of spawning escapement.

Size limits

- 198 Environmental and customary interests do not consider the current maximum size limit of 4 kg for commercial fishing to be effective. A lower measure is supported so that a greater proportion of the female eel population can reach sexual maturity without being vulnerable to fishing activity. Some interests suggest that consideration should be given to applying a maximum size limit measure to non-commercial interests.
- 199 MFish notes that the maximum size limit at least now applies consistently across the country for commercial fishers. This took some time to achieve, and fishery interests are increasingly appreciating the need for such other measures. However, the effectiveness of the maximum size limit measure for spawning escapement purposes should not be considered in isolation, or only in the context of present day eel population structures.
- 200 There are a number of other tools that all contribute to increasing spawning escapement, or increase the effectiveness of the maximum size limit in the medium term. These include the setting of conservative catch limits that seek to improve population size structures, and the complementary closure of specified catchments. The current review focuses on catch limits, and some catchment closures have already been implemented. The maximum size limit for commercial fishers could be reduced in the future, but it might be wise to consider this in the context of more defined fisheries management objectives. These objectives may change the focus on which tools should be applied to the fishery.
- 201 The need or desirability of a maximum size limit for eels taken by non-commercial interests has not been adequately discussed with this diverse sector. Furthermore, there are probably more generic and higher priority issues for MFish to be engaging with these interests about. For example, the proposed amendment of the Fisheries (Kaimoana Customary Fishing) Regulations 1998 will have implications for how some non-commercial eel fishing activities may be undertaken.
- 202 One submitter suggests that the minimum legal size for eels taken by commercial fishers should be increased from 220 grams to 300 grams in order that eels of a more culturally appropriate size become available. There are a variety of ways to ensure that size distributions of eel population are managed to preferred sizes. Harvest strategies could be put in place for a particular area, or other areas set aside from fishing by various sectors. Escapement tubes within fyke nets could be increased in size in particular areas, or catch could be sorted on gear retrieval to return fish of smaller legal size. A Waikato processor and commercial fishers landing to that plant presently have a voluntary arrangement where eels less than 300 grams are not landed.

Prohibition of commercial fishing in areas for spawning escapement purposes

- 203 Submitters generally support the prohibition of commercial fishing from further catchments and migration pathways as a way to increasing spawning escapement. MFish took the initiative to propose and implement some catchment closures for commercial fishing in the North Island in 2004. At that time MFish observed that consideration of other areas would be desirable over the medium term, and additional research information would be useful in

selecting appropriate candidates for further evaluation. A research report is due to be published that will assist with that process. MFish acknowledges suggestions for further areas that could be considered for commercial closure.

Prohibition of commercial fishing in areas of traditional importance for Maori customary food gathering

- 204 A submitter observes that more areas of traditional importance to Maori should be closed to commercial fishing. Commercial fishing was prohibited from some distinct areas for this purpose under s 186 of the Act in 2004-05. Further proposals could be considered within the context of broader strategies for management of the stock and/or area, and how they might be integrated with existing measures.
- 205 Should the Fisheries (Kaimoana Customary Fishing) Regulations 1998 be extended to apply to freshwater environments in the North Island, there is the possibility that mataitai could be created. A mataitai has been created in the Mataura River in Southland.

Other recreational controls / initiatives

- 206 Submitters want better monitoring of the recreational catch so that trends in recreational use of the eel fishery can be taken into account when considering management options. MFish has commissioned a research project to assess possible methodologies for estimating customary eel catch. A report on this research is due for review in March 2008. Outcomes from this research may be applicable to assessing methods to better estimate recreational catch. However, MFish notes that it is probably not feasible to collect cost-effective and accurate recreational catch estimates in the short to medium term.
- 207 Estimating non-commercial catch with reasonable certainty is a difficult research area. However, improvements in assessing customary catch would be possible if the Fisheries (Kaimoana Customary Fishing) Regulations 1998 were amended to extend to freshwater environments of the North and Chatham Islands. Understanding trends in customary catch may also provide insights into the recreational use of eels, particularly by Maori.
- 208 MFish considers that other suggestions to control recreational catch are premature or do not take into account existing measures (eg, the daily bag limit, gear restrictions). More importantly, it would be appropriate to await the outcome of the current proposal to amend the Fisheries (Kaimoana Customary Fishing) Regulations 1998. In the event that these regulations then apply to freshwater environments of the North and Chatham Islands, the nature and extent of non-commercial catch caught under these regulations may change. Further, the various tools under these regulations could better control local use of eel resources. MFish would welcome initiatives by various non-commercial interests to better monitor their own fishing activities.

Research

- 209 Submitters generally support more research being done to understand the state of various eel stocks, and the effect of various management strategies or interventions. MFish has an active research programme in place for the eel fishery, and each year additional research work is commissioned. Fishery interests are encouraged to attend annual Research Planning Group or Fishery Assessment Working Group meetings to participate in these discussions.

Public awareness

- 210 MFish agrees with a submission that greater public awareness of the issues facing the eel fishery, and its environment, is required. Parties involved in the current process could constructively contribute to this greater awareness.

Habitat management

- 211 Submitters generally request that MFish take a more active role in habitat management issues, as it affects fisheries resources. Habitat management issues are principally the domain of district and regional councils that work within the statutory framework of the Resource Management Act 1991. MFish has taken some initiatives to bring to the attention of councils the importance of good habitat management practices. However, in the first instance MFish continues to direct its energies towards improving the fisheries management framework. With these improvements in place, MFish may be able to take a greater role in resource management issues in the future.
- 212 MFish has commissioned some research on drain clearance impacts, written to some councils about such activities, and facilitated discussions with power companies regarding fish passage issues. MFish encourages fishery interests to recognise their common interest on environmental issues, and advocate for the change and accountability in management practices authorised under the Resource Management Act, where these practices affect fishery values.

Fisheries plans

- 213 The development of fisheries plans will better set out the fisheries management objectives for New Zealand fisheries. MFish has developed documents for the first stage of the fisheries plan process for eels. This step gathers the information known about the fishery and its current management. Documents have been prepared separately for North and South Islands at this stage. The South Island document builds on the plans developed by 'Te Waka a Maui me ona Toka Mahi Tuna' in the 1990s. Given that the biological stock distribution of eels extends nationally (or internationally for shortfin), MFish appreciates that there are elements of eel fishery management that should be considered on a national basis. There is a need to work towards this goal, while capturing the needs of interests at a range of other geographic scales.

Management arrangements for South Island eel fishery

- 214 Submitters seek better integration of eel fishery management across the country for the separate species. In order to achieve this, submitters suggest the South Island eel stocks, which combine both shortfin and longfin into the one stock, need to be separated consistent with the stock definitions for the North and Chatham Islands.
- 215 Originally, South Island eel stocks were proposed to be established as stocks on a separate basis (ie, SFE and LFE). The 1997 Deed of Settlement between the Crown and Ngai Tahu records that shortfin and longfin should be managed separately where practicable.
- 216 However, given the constraints of the legislation used at the time, the information readily available, and the treaty settlement obligation to introduce the South Island eel fishery into

the QMS by October 2000, there was insufficient time to determine the initial settings for each of the respective species.

- 217 Section 25 of the Act provides a basis for the Minister to reconsider the stock definitions applicable to various species. Better information on the proportion of shortfin to longfin in the various South Island QMAs is now more readily available. Some submitters suggested that a review of catch limits in the South Island should be undertaken. MFish believes that it might be better to resolve the definition of appropriate stocks first, or concurrently, with any proposals to adjust catch limits affecting either shortfin or longfin in the South Island.

Statutory Considerations

- 218 In forming the management options for North Island eel stocks, the following statutory considerations were taken into account.

- 219 **Section 8:** The purpose of the Act is to provide for the utilisation of fisheries resources while ensuring sustainability. The proposed management options seek to continue to allow for use while ensuring sustainability of respective eel stocks by setting a TAC that improves the population structure and abundance over the medium term, while bringing a halt to any decline in the fishery over the short term, such that the fishery:

- a) is sustainably managed;
- b) its availability to non-commercial fishers in particular is improved; and
- c) the relationship with interdependent stocks is also improved.

- 220 On balance, the revised management settings for all North Island eel stocks are likely to better enable people to provide for their social, cultural and economic aspirations, although the benefits to some stocks may take time to materialise. Social, cultural and economic considerations of generic application follow:

- a) Enabling people to provide for their social and cultural aspirations is of particular importance for this fishery. The eel fishery is one of the most important for Māori on a cultural basis, as it forms a key element of their customs, and is considered a taonga or treasure. This value extends to social considerations, as the species is taken on a non-commercial basis as a source of food. Eel fishing is also a leisure activity enjoyed by outdoor enthusiasts.
- b) The eel fishery in the North Island forms the basis of a moderately small sized commercial fishery that provides direct employment for commercial fishers, many of which operate on a part-time or seasonal basis, although processing at least two of the three main factories occurs year round.
- c) Economic impacts for the fishing industry in the short term are dependent on the TAC and TACC options chosen. The impacts at the level of the stock are of modest direct consequence for options that bring catch limits to within recent catch. Improved stock structure and abundance will lead to increased economic efficiencies in the medium term, something that is likely to be welcomed by the eel industry. Over time, improvements in CPUE will further reduce the relative costs associated with undertaking commercial fishing.

- 221 **Section 14:** Section 14 of the Act provides that the Minister may set a TAC for a stock other than in accordance with s 13(2) of the Act (ie, at or above a biomass level that would

produce maximum sustainable yield), where the Minister is satisfied that the purpose of the Act would be better achieved. This section may only be used for stocks having particular characteristics or management arrangements that make standard fishery stock assessments inappropriate.

- 222 In the case of North Island eel stocks, it was determined in 2004 that an insufficient level of information was available to have confidence that TACs could be set under s 13(2) of the Act. To better serve the purpose of the Act under s 14, the previous Minister agreed to a management strategy for North Island eel stocks to guide the setting of TACs. Accordingly, it is still appropriate to manage the stocks under s 14 of the Act for the short to medium term.
- 223 Section 14(8) sets out the criteria that stocks have to meet to be listed on the Third Schedule. This section may only be used for stocks having particular characteristics or management arrangements that make standard fishery stock assessments inappropriate.
- 224 **Section 11(1)(c):** Eel fisheries are typically not subject to significant natural variability in their biomass to the extent that stocks become susceptible to over-fishing on this basis alone. This is the case for all North Island eel stocks. The longevity and relatively slow growth rates experienced by eels in most waters, coupled with their reduced activity over winter months in southern North Island waters, plus the limiting factor of available habitat for larger eels, further reduces the scope for significant increases in biomass over the short term.
- 225 **Section 9(a) and (b):** The nature and extent of bycatch of any associated or dependent species in this fishery is not considered significant – it is likely that most species can be released unharmed given the use of the fishing methods employed. A reduction in overall harvesting pressure as provided by the TACs proposed is likely to assist in maintaining biodiversity. The presence of large eels, as top predators in the food chain, is likely to be of particular significance. Reducing TACs as proposed will contribute to an improvement in population structures, and an increased proportion of large eels in a stock. The presence of large eels may inhibit the numbers of introduced fish species in localised areas.
- 226 **Section 9(c):** No habitats of particular significance for fisheries management have been identified within the North Island that would be at risk as a result of eel fishing. It is considered unlikely that the fishing methods employed to take eels would have a demonstrable adverse effect on such habitats. MFish also notes that a range of habitats of particular significance for fisheries management have been protected to varying degrees under other legislation for other purposes (eg, National Parks Act 1980, Reserves Act 1977), so that fishing is restricted in those areas.
- 227 **Section 11(1)(a):** The effects of fishing on any stock and the aquatic environment are covered in the preceding paragraphs on section 9 considerations. MFish considers that the effects of fishing on all North Island eel stocks and interdependent stocks require some attention.

- 228 Interdependent stocks include both the associated species within the food web where eels are a key species, as well as other eel stocks, either within the same quota management area, or in other quota management areas. MFish is aware that the finfish species composition of some aquatic habitats in the northern North Island (eg, Waikato) has undergone significant change over at least the last 30-40 years. As a result of these changes:
- a) introduced species have changed the ecological structure of the biological community;
 - b) historical commercial fishing activity has reduced the number of large eels (particularly longfin), and proportionately increased the number of shortfin; and
 - c) relatively narrow population size structures, and potentially higher densities of smaller to moderately sized eels, have resulted.
- 229 These outcomes are likely to further affect species assemblages, sex ratios, and productivity of eel fisheries, in addition to any more far-reaching impacts on the sustainable use of other longfin stocks (eg, relative success of spawning escapement and subsequent recruitment). Stakeholders will need to contribute to the further specification of these issues such that TACs or other management settings can be adjusted to meet these matters over time.
- 230 **Section 5(a):** 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 are adequately addressed in the management options proposed for North Island eel stocks, noting that the legislative framework under the Act provides on-going scope to address issues that might arise from international obligations. Furthermore, the current proposals represent a further step in a direction where sustainability, utilisation and biodiversity values are improved.
- 231 **Section 5(b):** MFish considers that the management measures proposed are consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. MFish notes its on-going obligation to ensure that non-commercial Māori fishing interests are provided for in this and any subsequent review of management settings.
- 232 **Section 11(1)(b):** The existing controls that apply to eel stocks in the North Island include catch limits and allowances as part of being managed under the QMS, Sixth Schedule listing that provides for the return to the water of unwanted commercial catch, closed areas, a minimum and maximum legal size for commercial fishers; and a requirement for escapement tubes of specified diameters to be inserted in fyke nets used by commercial fishers. Recreational fishers are limited to a bag limit of six eels per day, and may not use more than one fyke net or hīnaki per person. While a person fishing recreationally need not have escapement tubes in their nets, they are limited to using a net with a mesh size of not less than 12 mm. At present, customary fishing purposes that may be authorised in freshwaters of the North Island are limited to fishing for hui and tangi only. The review of the TAC, allowances and TACC will not have an effect on the ability of these controls to be effective.
- 233 **Section 11(2A)(b):** No approved fisheries plans under s 11A of the Act exist for any of the North Island eel stocks.
- 234 **Section 11(2A)(a) and (c):** For the North Island eel fishery, the revision of catch limits in each quota management area are not considered to warrant an immediate need to generate or withdraw fisheries or conservation services for any of the relevant stocks. The draft

medium term research plan for the national eel fishery outlines research directions already adopted by MFish. No decision has been made not to require a service in this fishery. The level of conservation or fisheries services that might be required will depend on the range and level of risks associated with the use of any particular fishery. The range and level of risks associated with use at the proposed catch limits discussed in this paper are not so significant to change the level of services required in the short to medium term.

- 235 **Section 11(2)(a) and (b):** There are no specific 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 varying of sustainability measures, such as the catch limits, for North Island eel stocks.
- 236 **Section 11(2)(c):** Before setting any sustainability measure relevant to the Hauraki Gulf (eg, a TAC for the SFE 20, LFE 20, SFE 21 or LFE 21 stocks), the Minister must have regard to s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000. The Hauraki Gulf is defined in that Act to include all coastal waters and offshore islands from just south of Mangawhai, offshore to the Moko Hinau Islands, and south to Homunga Point (north of Waihi Beach). This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf as a matter of national importance. Importantly for eels, s 7 and s 8 also apply to the catchment of the Hauraki Gulf.
- 237 The varying of sustainability measures for the four eel stocks having part of their areas common to the Marine Park area will further the objectives set out in s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000, and ensure that the range of values associated with the use of the eel resource are enhanced for the people and communities in the area. Reductions in commercial catch should lead to improved economic opportunities or cost savings in the future as the eel stock rebuild. Eels, particularly shortfin, are taken both on a non-commercial and commercial basis in estuarine and salt waters of the Marine Park. As the proposed measures seek to reduce the amount of take for the relevant eel stocks for the purposes of sustainability, MFish considers that this is consistent with protecting and/or enhancing the life supporting capacity of a natural resource found within the Gulf.
- 238 **Section 20(1) and (2) and (5)** provides the authority to set and/or vary the TACC by way of notice. The setting or the variation for any quota management stock requires the TAC to be set first before the setting of a TACC.
- 239 **Section 21(1)(a and b) and (4)(a and b) and (5):** The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the allowances for recreational and Māori customary interests and the TACC, and all other mortality to the stock caused by fishing. No mātaimai exists in any of the quota management areas that would materially affect eel fishing. Area closures or fishing method restrictions applied under s 186A of the Act for customary fishing purposes are limited to small coastal areas that are not the subject of eel fishing, or the restrictions apply to species other than eels. No restrictions on commercial fishing have been implemented in any area within any of the North Island eel stocks for recreational interests arising from s 311 of the Act.

- 240 **Section 10:** MFish has used a variety of information sources to contribute to the development of this paper in addition to the submissions received in response to the IPP. Some of these are written accounts drawn from a range of disciplines, including:
- a) reports provided for purposes other than strictly fisheries management;
 - b) a reasonably extensive range of research reports on the fishery conducted for either MFish or other agencies over the last decade; and
 - c) an array of oral accounts to MFish staff over many years that trace the historical or present uses and values of the resource. Such observations have been made through attendance at hui, convening of workshops and seminars, personal interactions with a range of stakeholders, and first hand experience.
- 241 There is a reasonably extensive amount of information on the fishery and its uses sufficient to make the recommendations contained in this paper. However, there are some areas where information is uncertain or inadequate, such that a cautious approach should be adopted. In general the absence or uncertainty in the best available information is not a reason to postpone management action. The approach taken should further the purpose of the Act by ensuring that sustainability settings are sufficiently robust to allow for a rebuild of all North Island eel stocks over the medium term. Within that context, there is a greater probability that utilisation opportunities in the future will be improved. On-going review of new information will be required.
- 242 On a scientific basis, comparative quantitative information on the status of the resource does not extend as far back as is desirable, given the longevity of each species. Research findings, although not necessarily conclusive in all cases, or representative of all areas, are suggesting that trends in recruitment, population size structure, harvest rates and spawning escapement are of concern and/or warrant particular consideration. This is particularly so for longfin stocks. Further, there is a lack of scientific information on the role of eel species in maintaining biological diversity, and quantitative information on their relationship with associated and dependent species.
- 243 There is reasonably good information about the use of the fishery by the commercial sector, but quantification of the non-commercial use of the resource has not been attempted at the level of a stock, or extensively at other scales. Development of a method for assessing non-commercial catch is the subject of a current research project. Oral accounts of the importance of the resource for non-commercial stakeholders have been considered in developing this paper.

