

INITIAL POSITION PAPER - PROPOSAL FOR AN IN-SEASON TAC INCREASE FOR THE NORTHLAND SCALLOP FISHERY (SCA1) FOR 2006-07

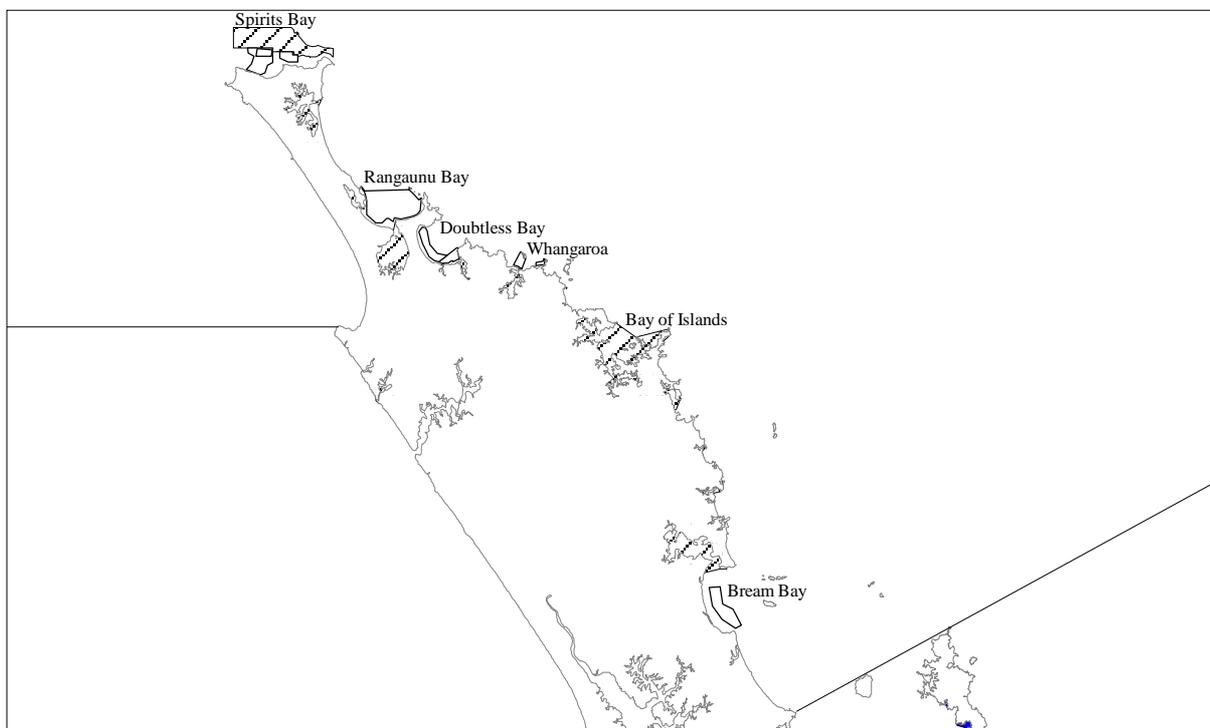


Figure 1: Boundary of the Northland Scallop Quota Management Area (SCA1), location of strata (dark outline) generally used for the Northland scallop fishery survey, and the location of areas (grey diagonal stripe) closed to commercial scallop fishing.

Proposal

- 1 The Ministry of Fisheries (MFish) proposes to review the total allowable catch (TAC) of the Northland scallop fishstock (SCA1) for the purpose of providing for an in-season TAC increase for the 2006-07 fishing year. MFish proposes that the Minister of Fisheries (the Minister), after taking into account information about scallop abundance in SCA1 during the current fishing year, considers the four management proposals below.

Option 1: Retain the non-commercial allowances and increase ACE to 70 tonnes

- a) Increase SCA1 TAC from 75 to 109 tonnes meatweight, and within the TAC:
- i) retain the recreational allowance at 7.5 tonnes meatweight;
 - ii) retain the customary allowance at 7.5 tonnes meatweight;
 - iii) increase the allowance for other sources of fishing-related mortality from 20 tonnes meatweight to 24 tonnes meatweight;
 - iv) increase the Annual Catch Entitlement (ACE) for quota owners from 40 tonnes meatweight to 70 tonnes meatweight.

Option 2: Retain the non-commercial allowances and increase ACE to 100 tonnes

- b) Increase SCA1 TAC from 75 to 149 tonnes meatweight, and within the TAC:
- i) retain the recreational allowance at 7.5 tonnes meatweight;
 - ii) retain the customary allowance at 7.5 tonnes meatweight;
 - iii) increase the allowance for other sources of fishing-related mortality from 20 tonnes meatweight to 34 tonnes meatweight;
 - iv) increase the ACE for quota owners from 40 tonnes meatweight to 100 tonnes meatweight.

Option 3: Increase the non-commercial allowances and increase ACE to 70 tonnes

- c) Increase SCA1 TAC from 75 to 120 tonnes meatweight, and within the TAC:
- i) increase the allowance for recreational fishing from 7.5 to 13 tonnes meatweight;
 - ii) increase the allowance for customary fishing from 7.5 to 13 tonnes meatweight;
 - iii) increase the allowance for other sources of fishing-related mortality from 20 tonnes meatweight to 24 tonnes meatweight;
 - iv) increase the ACE for quota owners from 40 tonnes meatweight to 70 tonnes meatweight.

Option 4: Increase the non-commercial allowances and increase ACE to 100 tonnes

- d) Increase SCA1 TAC from 75 to 170 tonnes meatweight, and within the TAC:
- i) increase the allowance for recreational fishing from 7.5 to 18 tonnes meatweight;
 - ii) increase the allowance for customary fishing from 7.5 to 18 tonnes meatweight;

- iii) increase the allowance for other sources of fishing-related mortality from 20 tonnes meatweight to 34 tonnes meatweight;
 - iv) increase the ACE for quota owners from 40 tonnes meatweight to 100 tonnes meatweight.
- 2 For all four options, MFish proposes that at the end of the current fishing year for SCA1, the TAC will be 75 tonnes meatweight, the allowance for recreational fishing will be 7.5 tonnes meatweight, the allowance for customary fishing will be 7.5 tonnes meatweight, the allowance for other sources of fishing-related mortality will be 20 tonnes meatweight, and the ACE will be 40 tonnes meatweight.

Management Framework

- 3 In 2002, the Minister agreed to set a TAC (under section 13 of the Fisheries Act 1996 (the Act)) for SCA1 at 75 tonnes meatweight to apply from the start of the fishing year on 1 April 2002. Section 13 requires the TAC to be set at a level that will maintain or move the stock towards or above the level that will produce the maximum sustainable yield (MSY), having regard to the interdependence of stocks.
- 4 MSY is defined, in relation to any fishstock, as being the greatest yield that can be achieved over time while maintaining the stock's productive capacity, having regard to the population dynamics of the stock and any environmental factors that influence the stock. A requirement to maintain stocks at a level that is capable of producing the MSY is generally recognised internationally as being an appropriate fishstock target, although there is some international support for MSY as the upper limit of the acceptable range of catch rather than a target.
- 5 The Minister also decided in 2002 to include SCA1 on the Second Schedule of the Act. A stock listed on the Second Schedule may have its TAC increased during the season under s 13(7) of the Act after consideration of information about the abundance of the stock during the current fishing year. At the start of the next fishing year, the TAC reverts to the level set at the start of the previous fishing year. The TAC can only be increased during the fishing year and not decreased.
- 6 Since 1992, surveys have been used to estimate the abundance of scallops in the Northland scallop fishery. Yield estimates based on these surveys have been used to set limits on catch (including the TAC, TACC, and allowances) for the fishery. In making his decision on required services, the Minister agreed to an optional survey for SCA1 during 2006. Quota holders decided that scallop abundance should be assessed during 2006. A research survey was undertaken in May 2006 to assess SCA1.
- 7 Section 13(7) recognises that abundance for some stocks can be highly variable between fishing years. Section 13(7) allows for further utilisation in years when the stock is more abundant, so long as the catch is still sustainable. Accordingly, the same considerations (s 13(2), s 13(3)) to achieve the direction and rate of change towards the MSY level must be taken into account in making an in-season adjustment as in setting the original TAC.
- 8 Section 20(4) of the Act states that the TACC set under s 20 shall have effect on and from the first day of the next fishing year, therefore the TACC cannot be increased during the fishing year. However, under s 68(1), if the Minister is satisfied that after considering the matters required for TACC setting (as prescribed under s 21(1)) he would have made an in-season increase to the TACC but for the prohibition against that in s 20(4), then he may create

additional ACE for fishers equal to the amount of the increase in the TACC that he would have made.

- 9 Section 21(1) provides that in setting or varying the TACC the Minister shall make an allowance for Maori customary fishing, recreational fishing, and other sources of fishing-related mortality. It is implicit that the Minister, when increasing the TAC in-season, can increase the level of non-commercial allowances. However, there is nothing in the Act that requires these allowances to automatically revert to the original allowances at the end of the fishing year; only the TAC reverts. Therefore, if the Minister decides to increase any of the allowances for the remainder of the current fishing year, then part of his decision will also be that the allowances will reduce to the original level at the start of the next fishing year on 1 April 2007.
- 10 The process outlined in the preceding paragraphs has become standardised as it has been used for the Coromandel fishery every year since 2002 for an in-season ACE increase. The same process was also used last year in the Northland scallop fishery.

Steps in the process to review the TAC

- 11 To progress this review, MFish proposes the following steps:
- consideration of the survey information about the abundance of scallops in SCA1;
 - consultation with quota holders, tangata whenua, stakeholders and Te Ohu Kai Moana in order to review the TAC, allowances, and ACE for SCA1 (this paper);
 - the Minister's consideration of MFish's final advice and his decision on the proposal;
 - notice of any increased TAC agreed to by the Minister to be notified in the *New Zealand Gazette*;
 - generation of ACE.

Fishery information

Species Biology

- 12 Scallops (*Pecten novaezelandiae*) inhabit waters to about 60 m deep, but are more common in the Northland fishery in depths of 10 to 40 m. Growth rates are spatially and temporally variable; growth to 100 mm takes between 1.5 and 3.5 years. The maximum age of scallops in unexploited populations is about 6 or 7 years.
- 13 Scallops are a hermaphroditic species, each individual carrying both male and female gonads at the same time. Most individuals are sexually mature at about 60 mm, although larger individuals have disproportionately larger gonads. The minimum legal size limit of 100 mm probably mitigates risk of recruitment failure, as scallops mature and spawn before reaching the size limit. They are extremely fecund and can spawn several times each year (although not all of these spawning events lead to successful spat settlement). Larval development lasts for about 3 weeks, depending on water temperature.
- 14 Scallops grow rapidly (albeit with considerable variation), have high natural mortality, and exhibit highly variable recruitment. Such a life history results in fluctuating biomass and catch, and reliance on relatively few year-classes.

Fishery characteristics

- 15 The management arrangements for commercial and non-commercial fishers differ. Many of Northland's harbours within SCA1 are closed by fisheries regulation to commercial scallop fishing¹. Therefore, to some extent, the non-commercial and commercial fishing sectors are separated spatially. The main beds in the commercial scallop fishery are found at Spirits Bay, Rangaunu Bay, Doubtless Bay, Whangaroa, and Bream Bay (see Figure 1); Mangawhai and Pakiri Beach occasionally. The minimum legal size limit (100mm) and fishing season (15 July to 14 February (inclusive) of the following year) is the same for both sectors. Recreational fishers are restricted to a maximum daily bag limit of 20 scallops per fisher per day in SCA1.
- 16 Maori customary fishers are currently able to take scallops for hui and tangi purposes in accordance with regulation 27A of the Fisheries (Amateur Fishing) Regulations 1986. If a kaitiaki has been appointed, then she or he can authorise the taking of scallops under the Fisheries (Kaimoana Customary Fishing) Regulations 1998.

Commercial fishery

- 17 The reported commercial catch has varied from 14.9 tonnes (meatweight) in 2000 to 208.3 tonnes (meatweight) in 1995 (Table 1). Since 1992, results from dredge and dive surveys undertaken before the start of each fishing season have been used to limit the commercial catch. However, the catch limits for SCA1 have often not been caught, notably in 1998, 1999 and 2000 (Table 1). Due to low scallop abundance, the quota owners agreed to a voluntary limit of 40 tonnes (1999) and 30 tonnes (2000).

Table 1: SCA1 reported landings (tonnes meatweight) by commercial fishers from 1986 to 2004, and the TACC from 1996 to 2005.

Fishing year	Reported landings (LFRR data)	TACC
1986-87	113.6	
1987-88	183.2	
1988-89	171.0	
1989-90	164.0	
1990-91	114.5	
1991-92	157.9	
1992-93	134.9	
1993-94	113.6	
1994-95	205.4	
1995-96	208.3	
1996-97	129.1	188*
1997-98	136.1	188
1998-99	30.7	106
1999-00	21.6	106
2000-01	14.9	60
2001-02	37.7	40
2002-03	39.9	40
2003-04	38.2	40
2004-05	39.9	40
2005-06	69.7	70

* Individual catch entitlements

¹ The commercial and recreational scallop fisheries can also be closed under shellfish sanitation requirements.

- 18 The variability of scallop biomass over short timeframes may be partly responsible for why limits on catch have not always been achieved. To reduce this influence as much as possible, surveys are conducted as close to the expected start of the commercial season as possible. Another factor is the difficulty in predicting available yields in a scallop fishery with any precision. The uncertainty due to the variables of dredge efficiency and residual scallop density are discussed in the section on information about abundance during the current fishing year. There is also additional uncertainty when the TACC is allocated in meatweight, because the meatweight to greenweight ratio varies throughout each year and between years. Actual yields will depend on scallop condition, natural mortality, scallop growth, and the timing and location of fishing.
- 19 The Northland scallop stock fluctuates in biomass from year to year. Recruited biomass in any given year cannot be predicted from historical biomass estimates, nor even from biomass estimates in the previous year adjusted by catch in the intervening season. However, the system may not be entirely random. For the Coromandel scallop fishery, prior to 1999, there appeared to be a relationship between scallop recruitment (as measured by catches two years later) and the Southern Oscillation Index. The relationship ceased after 1999 when the Coromandel scallop catch was dramatically reduced due to the “black gill” condition in scallops and the spread of the *Chaetopterus* tubeworm into some areas. It is believed that “black gill” and *Chaetopterus* also affected the Northland scallop catch in the late 1990s and early 2000s, especially in the southern parts of the fishery.

Recreational fishery

- 20 Telephone/diary surveys were undertaken during 1993-1994, 1996, 1999-2000, and 2000-01. The recreational harvest estimates (tonnes meatweight) were:

1993-94	5-7.5
1996	4.0
1999-2000	4.1
1999-2001	3.6

- 21 The recreational diary surveys include catches reported from areas closed to commercial fishing by regulation. The areas closed to commercial dredging by regulation include popular recreational and customary fishing areas such as Whangarei Harbour, the Bay of Islands, Whangaroa Harbour, and the inner parts of Doubtless Bay. The rationale for these closed areas in this fishery is that the closures protect key non-commercial scallop fishing areas from the effects of commercial scallop dredging. In general, the closures are utilisation measures, rather than sustainability measures.

Māori customary fishery

- 22 In common with many other shellfish, scallops are important to Māori as a traditional food. However, no quantitative information on the level of the overall customary take of SCA1 is available. Some kaumātua and kaitiaki may keep records of authorisations to take fish and shellfish pursuant to the Maori customary provisions under the Fisheries Act. However, MFish’s experience is that most of these authorisations relate to mussels, rock lobster, and paua. In the future, better quantitative information on the customary catch may become available due to the more comprehensive reporting required under the customary fishing regulations.

Other sources of fishing-related mortality

- 23 Quantitative information on the level of illegal catch is not available. However, quantitative information on other sources of fishing-related mortality was gathered in the Coromandel scallop fishery as part of MFish project AKSC03 during the 1996-97 fishing year. This work by NIWA assessed the incidental effects on growth and mortality of scallops from encounters with commercial dredges of various designs.
- 24 Individual-based population modelling and yield per recruit analysis suggested there are incidental effects of dredging on growth and mortality rates that are highly influential on the determination of yield from scallop dredge fisheries. Using NIWA's model, the level of incidental mortality was estimated to be 34.4% of the level of the commercial catch at a fishing mortality of $F_{0.1}$. Based on this model, an allowance for fishing-related mortality is proposed later in this paper for the Northland fishery.
- 25 Recreational fishers dive, hand gather or use small dredges to collect scallops. Research information indicates that recreational dredging is responsible for negligible incidental mortality. Accordingly, no allowance will be made for incidental mortality by recreational fishers.

Fishery assessment

General methodology

- 26 The yield estimates most commonly used in New Zealand are Maximum Constant Yield (MCY) and Current Annual Yield (CAY). These are derived from two ways of viewing MSY – a static interpretation and a dynamic interpretation. Under a static interpretation, MCY is the largest constant commercial catch that may be taken sustainably, with an acceptable level of risk, even if the number of recruits fluctuates from year to year.
- 27 Under a dynamic interpretation, CAY is the catch that can be taken in a particular year, and is calculated as a constant proportion of the biomass ie. CAY increases and decreases in tandem with changes in the stock biomass. It is possible to estimate CAY only when the current stock size is known, as is possible in the case of scallops immediately after a survey. The methodology for calculating CAY is set out in MFish's Stock Assessment Plenary report.
- 28 The current TAC for SCA1 is largely based on an estimate of MCY for the fishery. This is the level of constant commercial catch that is estimated to be sustainable, with an accepted level of risk, at all probable levels of biomass. However, because of the annual variation of scallop biomass, the CAY provides the most appropriate estimate of yield on which to base any consideration for an in-season increase in TAC.
- 29 Since 1992, recruited biomass at the start of the season, for most years, has been estimated by research surveys. Counts of scallops above a critical size at each survey site are converted to numbers per square metre of seabed according to the area swept by the dredge. The absolute density of scallops is estimated by correcting for the efficiency of the dredges. The numbers of scallops are calculated by multiplying the mean scallop density by the area of each survey stratum. Mean recruit weight is estimated and used to calculate biomass.
- 30 The draft report from NIWA for the 2006 survey provided two CAY estimates calculated using the internationally-accepted target rate of fishing mortality $F_{0.1}$. The results of the NIWA report, including a comparison between years are summarised in Attachment 1. The

first CAY estimate (152 tonnes meatweight) provides for a “pessimistic outlook” based on conservative assumptions about dredge efficiency, growth, mortality, and conversion factors. The second estimate (366 tonnes meatweight) provides for an “average outlook” is more realistic and uses less conservative assumptions. NIWA did not provide an “optimistic outlook”. In addition, if an allowance is made for areas of low scallop density at a level of 0.04 m^{-2} (approximately equates to a dredging rate of 50kg greenweight per hour), then both CAY estimates would be reduced by about 24%.

Environmental Issues

- 31 The Act prescribes environmental principles that must be taken into account when exercising powers in relation to utilisation of fisheries resources while ensuring sustainability. Associated or dependent species (including non-fish bycatch) should be maintained above a level that ensures their long-term viability. Biological diversity of the aquatic environment (ie, the variability of living organisms, including diversity within species, between species, and of ecosystems) should be maintained, and habitat of particular significance for fisheries management should be protected.
- 32 The history of commercial dredging in the Northland scallop fishery dates back to the 1970s, and trawling has occurred in the area since the late nineteenth century. There is no doubt that these fishing methods have an impact on the seabed and seabed communities. However, the seafloor in the area is likely to have also been modified by the impact of land-based activities over a longer time period.
- 33 MFish is not currently aware of any habitat of particular significance for fisheries management that requires additional protection. MFish does not consider that the catch levels proposed below in this paper will put at risk the long-term viability of associated species or biological diversity within the area of the fishery.
- 34 Between 1997 and 2003, populations of the large tubeworm (*Chaetopterus spp.*) spread throughout the nearshore marine environment in northeastern New Zealand. A Uniservices research report maps the distribution of the tubeworm around northeastern New Zealand, and discusses the species taxonomic status and the ecological effect of *Chaetopterus* species in other parts of the world.
- 35 The tubeworm affects scallop fishing by clogging dredges. The presence of vast numbers of the tubeworm, combined with its rapid spread, has also raised concerns about the potential ecosystem effects of this organism. However, as indicated earlier, tubeworms appear to have declined over the last three years and were rare during the 2006 dredge survey. Nonetheless, the increase and decrease in the tubeworm population illustrates how variable associated and dependent species can be in seafloor communities.

Current and potential research

- 36 The current fisheries services applying to this fishery include optional surveys to estimate yield from the commercial scallop beds.

Proposed TAC, allowances, and ACE

TAC setting

- 37 Under s 13 of the Act, the TAC must be set at a level that will maintain the stock at or above, or move the stock towards or above, the level that will support the MSY. As SCA1 is on the

Second Schedule to the Act, under s 13(7) the Minister can increase the TAC in-season after considering information about the abundance of the stock.

38 MFish notes that there is no current assessment of the entire SCA1 stock on which to base a TAC. The available assessment information on yield is based on a survey of the main commercial scallop fishing beds. The CAY method estimates sustainable yield from areas primarily utilised by commercial fishing. The CAY estimate is a proxy for MSY, and the proposed TAC increase is likely to move the stock towards a level that can support the MSY.

39 At a recent meeting of the Directors of the Northland Scallop Enhancement Company, the results of the research survey in the draft NIWA report were discussed. The Directors were aware of the projected improvement in the fishery. Most of the Directors favoured an increase in the commercial catch limit from the baseline 40 tonnes to 70 tonnes (same as 2005). However, other Directors and some of the quotaholders who have subsequently contacted MFish, favoured an increase to 100 tonnes.

40 The President of the NZ Recreational Fishing Council (NZRFC) has commented to MFish on the 2006 survey results and the draft NIWA report. The NZRFC notes that the fishery has rebuilt strongly with biomass levels now greater than any previous year. The NZRFC is not opposed to the commercial increase, but considers that the recreational allowance should be increased by the same magnitude as the commercial increase. The NZRFC also strongly requests that the daily bag limit should increase in both the Northland and Coromandel scallop fisheries so that recreational fishers can also benefit from the rebuilt scallop fishery.

41 MFish did not receive comments on the draft NIWA report from customary Maori, and the environmental sector.

42 MFish proposes the following four options to increase the Northland scallop TAC.

	"Baseline" levels	Option 1	Option 2	Option 3	Option 4
Customary	7.5	7.5	7.5	13	18
Recreational	7.5	7.5	7.5	13	18
Incidental	20	24	34	24	34
TACC	40	-	-	-	-
Additional ACE	-	30	60	30	60
TAC	75	109	149	120	170

43 The four options depend on two key decisions. First, whether to increase the total available ACE for commercial fishers for the 2006 season from 40 tonnes meatweight to 70 tonnes, or from 40 tonnes to 100 tonnes meatweight. Second, whether or not to increase the allowance for recreational and customary fishers by the same proportionate amount as the commercial increase. For all of the proposed options, at the end of the current fishing year for SCA1, the proposed TAC, ACE, and allowances would revert to the initial "baseline" levels at the start of the fishing year.

44 MFish notes that the proposed TAC for option 4 (170 tonnes) is more than the "pessimistic outlook" CAY (a proxy for MSY) estimate of 150 tonnes stated earlier. However, the two numbers are not comparable because the CAY estimate does not include a yield estimate from the areas closed to commercial scallop fishing. In addition, the "pessimistic" CAY estimate is particularly conservative. The option 4 TAC is much less than the "average"

CAY estimate (366 tonnes) which is based on more realistic assumptions about factors such as dredge efficiency and scallop growth.

Allowances and ACE

- 45 MFish notes there is no statutory obligation to make an adjustment to Maori customary or recreational interests when the TAC is varied pursuant to s 13(7) of the Act. However, s 68(1) requires the Minister to consider the provisions of s 21, under which he has the discretion to determine allowances.

Recreational interests

- 46 In considering an in-season TAC increase, and having regard to the matters under s 21, MFish proposes two variations for the recreational allowance. Options 1 and 2 entail no change to the allowance because there is no recent reliable quantitative information available on the recreational fishery. Options 3 and 4 entail increases in the allowance by the same proportion as the commercial increase on the basis that the recreational catch is likely to increase because of the strong increase in scallop biomass.

Option 1 and 2: No change to the recreational allowance

- 47 MFish acknowledges there is a lack of recent reliable quantitative information available on the tonnage of scallops taken by the recreational sector. In addition, no quantitative information is available on scallop biomass in the areas closed to commercial scallop fishing. Without this information, there is no way of knowing what a sustainable catch level might be for the recreational sector, and whether or not the allowance has been under- or over-caught.
- 48 This was essentially the position adopted by the Minister in 2005 in making his decision on the Northland scallop fishery TAC. The Minister decided to not increase the recreational allowance because he wanted a more robust system for assessing the scallop stocks in the non-commercial fishing areas to be developed.
- 49 Another consideration is that most of the recreational catch estimates (see earlier) from the telephone/diary surveys are less than the allowance. When the recreational allowance was initially set in 2002, MFish recognised that the recreational catch will vary from year to year partly in relation to scallop availability and abundance. The allowance was set at the largest of the recreational catch estimates to accommodate the variability of the recreational catch and to ensure that it was unlikely that the recreational catch would exceed the allowance.
- 50 In 2002, the results of the 1999-2000 and the 2000-01 surveys were not available for consideration for setting the recreational allowance. However, these recreational catch estimates (4.1 and 3.6 tonnes) were obtained when it is likely the overall Northland scallop biomass was at a very low level. Therefore, the recreational catch may increase with the recent increase in scallop biomass, but the catch may not increase by enough to exceed the current allowance of 7.5 tonnes.
- 51 Accordingly, under options 1 and 2, MFish proposes no change to the recreational scallop allowance and the level would remain at 7.5 tonnes meatweight.

Option 3 and 4: Increase the recreational allowance

- 52 MFish notes that the survey results relate primarily to the scallop beds mainly fished by the commercial sector. However, trends in scallop abundance in the “non-commercial” beds are likely to be similar to abundance trends for the surveyed beds. Due to the increased biomass, an increased recreational catch could be attained for 2006-07 from a number of factors. It is likely that existing fishers will fish more frequently for scallops. As people become more aware that scallop abundance has increased, there are likely to be more “new” or “occasional” fishers fishing for scallops. In addition, “habitual” fishers may fish more frequently and more frequently attain their full legal entitlement of scallops ie. the current daily bag limit of 20 scallops per fisher per day.
- 53 MFish believes that the significant increase in scallop biomass in the Northland fishery is likely to lead to an increase in the recreational catch. Under this scenario, MFish considers it would be reasonable to propose an increase in the recreational allowance by the same proportion as the proposed commercial increase. Accordingly, for option 3 MFish proposes to increase the recreational allowance from 7.5 tonnes meatweight to 13 tonnes meatweight for 2006-07. For option 4, MFish proposes to increase the recreational allowance from 7.5 tonnes meatweight to 18 tonnes meatweight for 2006-07.
- 54 For both options 3 and 4, the recreational allowance would then decrease to 7.5 tonnes meatweight at the end of the current fishing year for SCA1 (31 March 2007).

Māori customary interests

- 55 In common with many other shellfish, scallops are important to Māori as a traditional food. However, no quantitative information on the level of customary take of SCA1 is available. MFish has applied a general criterion that, in the absence of quantitative catch information and where the fishery is of known importance to Maori, the recreational allowance is used as a benchmark to set the customary allowance.
- 56 Accordingly, MFish proposes two options for the customary allowance. Both options 1 and 2 retain the customary allowance at the current level – 7.5 tonnes meatweight. Option 3 is to increase the customary allowance to the level of the proposed recreational allowance – 13 tonnes meatweight. Option 4 is to increase the customary allowance to 18 tonnes the same as the recreational allowance.
- 57 Under both options 3 and 4, the customary allowance would then decrease to 7.5 tonnes meatweight at the end of the current fishing year for SCA1 (31 March 2007).

Other sources of fishing-related mortality

- 58 When SCA1 was introduced into the QMS in 1997, the allowance for other sources of fishing-related mortality was based on the level of incidental mortality from the commercial dredge fishery which was considered to be 50% for the relatively high fishing pressures thought appropriate at that time. Following the SCA1 baseline TAC reductions in the late 1990s and early 2000s, the baseline allowance for other sources of fishing-related mortality was set at 20 tonnes, which is 50% of the baseline TACC at 40 tonnes.
- 59 However, the level of incidental mortality expected in the commercial dredge fishery is now included in the NIWA stock assessment model at 34.4% of the catch level at F0.1. Therefore, for options 1 and 3 with the ACE increase to 70 tonnes, MFish proposes to

increase the allowance for other sources of fishing-related mortality from 20 to 24 tonnes meatweight. For options 2 and 4 (proposed ACE increase to 100 tonnes), MFish proposes to increase the allowance for other sources of fishing-related mortality from 20 to 34 tonnes meatweight.

- 60 Under all four options, the other sources of fishing-related mortality allowance would then decrease to 20 tonnes meatweight at the end of the current fishing year for SCA1 (31 March 2007).

ACE for commercial fishers

- 61 MFish notes that s 20(4) of the Act does not allow the TACC to be increased in-season if the Minister decides to increase the TAC. However, under s 68(1), if the Minister after taking into account the matters under s 21, is satisfied that he would have increased the TACC but for the s 20(4) prohibition, then he may create an additional amount of ACE equal to the amount he would have increased the TACC. Any increase in ACE will be distributed proportionally amongst the scallop quota owners according to the formula in s 68(2).

- 62 MFish considers that the Minister can be satisfied that the survey results provide adequate grounds for increasing the TACC, but for the impediment of s 20(4). On that basis, MFish believes that the Minister can consider making available an additional amount of ACE equivalent to the TACC increase he would have considered. Accordingly, MFish proposes two variations to increase the ACE level:

- options 1 and 3 - increase from 40 to 70 tonnes meatweight;
- options 2 and 4 - increase from 40 to 100 tonnes meatweight.

- 63 Based on a market port price of \$16.00 per kilogram of meatweight (\$16,000 per tonne), the proposed increase in ACE of 30 tonnes meatweight equates to an increased gross return to the commercial fishers of \$480,000 for the 2006 season. An increase in ACE of 60 tonnes meatweight equates to an increased return of \$960,000.

Other legislative considerations

- 64 Section 5 of the 1996 Act requires that the Minister shall act in a manner consistent with New Zealand's international obligations and Treaty of Waitangi (Fisheries Claims) Settlement Act 1992. To this end, the provisions of general international instruments such as UNCLOS and the Fish Stocks Agreement have been implemented through the provisions of the 1996 Act. The Ministry is not aware of any specific international obligations relating to the Northland scallop fishery. The proposed options are consistent with the obligations relating to the Treaty of Waitangi (Fisheries Claims) Act 1992.

- 65 Before setting or varying any sustainability measure, s 11(1) of the Act requires the Minister to take into account specified matters. These include:

- i) any effects of fishing on any stock and the aquatic environment;
- ii) any existing controls that apply to the stock or area concerned;
- iii) the natural variation of the stock concerned.

- 66 MFish acknowledges that dredging will be having some impact on habitats of significance to the management of the scallop fishery. This is because juvenile scallops in dredged areas

tend to experience higher mortality than juveniles in non-dredged areas. To some extent, this impact will be mitigated by the small increase in catch (relative to the estimated CAY) sought by commercial fishers. MFish does not consider that dredging is having a significant adverse effect on habitats for finfish fisheries. For example, scallop dredging does not occur in areas that are particularly important to snapper spawning or juvenile recruitment.

- 67 Evaluation of the available information on the effects of fishing has led to a number of restrictions that underpin the existing commercial fishery management regime for SCA1. These restrictions are consistent with the over-riding obligation to avoid, remedy or mitigate the adverse effects of fishing. They are implemented through a combination of regulations and voluntary agreement and include:
- a) restrictions on dredge size to reduce adverse effects on the seafloor;
 - b) daylight only fishing (reduces fishing intensity);
 - c) daily catch limits to reduce fishing intensity (Northland Scallop Enhancement Company initiative).
- 68 If information becomes available that indicates dredging is having an adverse effect on an area of special or significant biodiversity, then MFish will take steps to avoid, remedy, or mitigate the adverse effect. Such a situation occurred at Spirits Bay in the Northland scallop fishery in the late 1990s. Research information indicated that dredging and trawling were likely to be having a significant adverse effect on the rare and endemic benthic biota only occurring in that area. Consequently, a large area at Spirits Bay and Tom Bowling Bay was closed by fisheries regulation to dredging and trawling.
- 69 All options proposed here recognise that biological systems can be inherently variable, and stocks are prone to fluctuations in abundance. This particularly applies to scallop populations.
- 70 Section 11(2A) of the Act requires that before varying any sustainability measure the decision-maker must take into account any approved fisheries plan, any conservation or fisheries required services, and any decisions not to require fisheries services. The current fisheries service applying to the fishery is a pre-season survey to estimate CAY for the fishery. The survey estimate has been considered and forms the basis for the proposals contained in this paper. There are no conservation services applying to the fishery.
- 71 Currently, there is no approved fisheries plan for the Northland scallop fishery. However, the Ministry and stakeholder leaders are preparing a draft fisheries plan for the Coromandel scallop fishery. It is intended that the draft Coromandel plan could be ready for formal statutory consultation with stakeholders and the general public near the end of the year. Based on submissions received, the Minister could then be in a position to decide whether or not to approve the plan in early-mid 2007. Although there are some key differences between the fisheries, a Coromandel scallop plan would be a useful template and starting point for the development of a Northland scallop plan.
- 72 One of the key advantages of a scallop plan approved by the Minister is that the in-season TAC adjustment process is likely to cease in its current form. Instead, the process should be abbreviated and managed by the Fisheries Plan process. The Minister will only be asked to approve the outcome of a pre-agreed set of decision rules on how the TAC and allowances would be adjusted.

- 73 In relation to s 11(2) of the Act, 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 other management strategy or plan under the Conservation Act 1987, that are considered relevant to the setting of sustainability measures for the Northland scallop fishery.
- 74 Under s 11(2)(c), the Minister must have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 as part of the Northland scallop fishery is part of the area defined as the Hauraki Gulf for the purpose of that legislation. In summary, sections 7 and 8 articulate the national significance of the Hauraki Gulf to sustain the life-supporting capacity of the environment and note that management objectives for the Hauraki Gulf are to protect the life supporting capacity of the environment and to maintain the contribution of the natural resources to the social, recreational, and economic well-being of the people and communities of the Hauraki Gulf and New Zealand. Setting a sustainable commercial catch limit on a fishery resource, having taken into account the environmental principles of the Act, is consistent with these objectives as it provides for utilisation while ensuring sustainability.
- 75 Section 11 of the Act also provides for the setting or varying of sustainability measures other than a TAC or catch limits. The Minister may determine that area closures and seasonal constraints required for the annual management of this fishery be set as sustainability measures. As mentioned, a number of commercial closed areas are already in place in the Northland scallop fishery, although these are not considered sustainability measures.
- 76 Stakeholders have indicated their preference for a harvesting strategy that primarily involves in-season adjustment of the TAC. However, it is considered that some of the current regulatory controls (eg. season length, minimum size limit) could be reviewed in the future, possibly as part of the development of a fish plan for the fishery.

Administrative implications

- 77 There will not be an opportunity to amend the cost recovery levies prior to the end of the SCA1 fishing season. Consequently, an over recovery will occur because levies are set on a per unit basis (kg or quota share), and the number of units will increase. In setting future levy orders, the Minister must have regard to over recoveries.

Consultation

- 78 In early June, MFish asked stakeholder representatives and members of the Shellfish Working Group to review the draft NIWA research report entitled “Dredge survey and stock assessment for the Northland scallop fishery, 2006”. The report forms the basis of the proposed TAC change. No significant comments of a scientific nature were provided on the draft. Subject to a few minor changes, the document will therefore be accepted as the final report.
- 79 Prior to the statutory consultation with stakeholders involving this paper as the key document, there has been some preliminary consultation. At recent meetings of the Northland Scallop Enhancement Company, the management implications of the survey results were discussed. MFish also discussed management issues with the President of the NZRFC.
- 80 As indicated earlier, the main commercial stakeholder organisation suggested the basis for the proposed ACE increase. However, given the favourable stock assessment information,

MFish is interested in hearing alternative views and options from other stakeholders for the current fishing year, and for the medium to long-term future of the Northland scallop fishery.

- 81 The 2006 in-season review of the Northland scallop TAC will be based on the process that operated in the Coromandel scallop fishery for the last four years. Stakeholders will have around three weeks to Thursday 24 August 2006 to provide MFish with written submissions commenting on the management proposals. Post submissions to: Ministry of Fisheries, PO Box 19747, Avondale, Auckland. A consultation meeting will also be held for all interested parties to discuss the proposal:

1-4pm Friday, 18 August 2006
Hatea Conference Room, Settlers Hotel
61-69 Hatea Drive
WHANGAREI

- 82 The short time period for consultation is necessary because of the relatively short scallop fishing season, which closes on 14 February. Any in-season changes to the management measures for SCA1 need to be implemented as early as possible to be meaningful within the season.
- 83 It is also important to note that all submissions are subject to the Official Information Act and can be released, if requested, under the Act. If there are any specific reasons for wanting to have a submission withheld, then please set out these reasons in the submission. MFish will consider the reasons when making any assessment for the release of submissions if requested under the Official Information Act.

Summary

- 84 The Act imposes an obligation to provide for the utilisation of fisheries resources as long as sustainability is ensured. The proposed management measures take into account the survey information showing a biomass increase for the Northland scallop fishery.
- 85 There is a reasonable level of support amongst key commercial and recreational fishing groups for the TAC to be increased, and to increase the amount of ACE from 40 tonnes to either 70 or 100 tonnes meatweight. This would allow additional utilisation and income to commercial fishers who derive part of their livelihood from this fishery. Two changes are proposed for the non-commercial allowances. MFish considers that the proposed measures for the SCA1 fishery are consistent with the purpose and principles of the Act and associated obligations.

Preliminary recommendation

86 MFish proposes four management options for an in-season TAC increase for SCA1.

Option 1: Retain the non-commercial allowances and increase ACE to 70 tonnes

- a) Increase SCA1 TAC from 75 to 109 tonnes meatweight, and within the TAC:
 - i) retain the recreational allowance at 7.5 tonnes meatweight;
 - ii) retain the customary allowance at 7.5 tonnes meatweight;
 - iii) increase the allowance for other sources of fishing-related mortality from 20 tonnes meatweight to 24 tonnes meatweight;
 - iv) increase the Annual Catch Entitlement (ACE) for quota owners from 40 tonnes meatweight to 70 tonnes meatweight.

Option 2: Retain the non-commercial allowances and increase ACE to 100 tonnes

- b) Increase SCA1 TAC from 75 to 149 tonnes meatweight, and within the TAC:
 - i) retain the recreational allowance at 7.5 tonnes meatweight;
 - ii) retain the customary allowance at 7.5 tonnes meatweight;
 - iii) increase the allowance for other sources of fishing-related mortality from 20 tonnes meatweight to 34 tonnes meatweight;
 - iv) increase the ACE for quota owners from 40 tonnes meatweight to 100 tonnes meatweight.

Option 3: Increase the non-commercial allowances and increase ACE to 70 tonnes

- c) Increase SCA1 TAC from 75 to 120 tonnes meatweight, and within the TAC:
 - i) increase the allowance for recreational fishing from 7.5 to 13 tonnes meatweight;
 - ii) increase the allowance for customary fishing from 7.5 to 13 tonnes meatweight;
 - iii) increase the allowance for other sources of fishing-related mortality from 20 tonnes meatweight to 24 tonnes meatweight;
 - iv) increase the ACE for quota owners from 40 tonnes meatweight to 70 tonnes meatweight.

Option 4: Increase the non-commercial allowances and increase ACE to 100 tonnes

- d) Increase SCA1 TAC from 75 to 170 tonnes meatweight, and within the TAC:
 - i) increase the allowance for recreational fishing from 7.5 to 18 tonnes meatweight;
 - ii) increase the allowance for customary fishing from 7.5 to 18 tonnes meatweight;
 - iii) increase the allowance for other sources of fishing-related mortality from 20 tonnes meatweight to 34 tonnes meatweight;
 - iv) increase the ACE for quota owners from 40 tonnes meatweight to 100 tonnes meatweight.

87 For all four options, MFish proposes that at the end of the current fishing year for SCA1, the TAC will be 75 tonnes meatweight, the allowance for recreational fishing will be 7.5 tonnes meatweight, the allowance for customary fishing will be 7.5 tonnes meatweight, the allowance for other sources of fishing-related mortality will be 20 tonnes meatweight, and the ACE will be 40 tonnes meatweight.

Attachment 1: Northland scallops stock assessment summary (2006)

- 1 A research survey of the main Northland scallop beds (Spirits Bay/Tom Bowling Bay, Rangaunu Bay, Bream Bay, Mangawhai/Pakiri) used for commercial fishing was conducted in May 2006. For the overall survey area, a simple “area-swept” analysis suggests there were 36 million scallops (with a Co-efficient of Variation (CV) of 14%) at or above a size of 100 mm at the time of the survey. However, this is an under-estimate, as this assumes that dredges are 100% efficient at catching all the scallops in the path of the dredge.
- 2 Dredge efficiency was assessed as part of many of the surveys in the 1990s by conducting experiments to compare scallop catch rates between divers and dredges operating in the same area at the same time. Previous estimates of dredge efficiency and selectivity on sandy substrates have been made using a variety of vessels. However, dredge efficiency was not assessed for the vessel used for the 2006 survey due to cost constraints and concerns about diver safety. Accordingly, for the 2006 assessment, the historical average selectivity pattern was used to correct for dredge efficiency. By allowing for average dredge efficiency catch rates, the number of scallops above 100 mm is estimated to be 75 million.
- 3 To allow a rough comparison of trends over the history of the fishery since 1992, survey estimates based on scallops 95mm and above are provided (Table 2).

Table 2: Millions of scallops (95 mm or greater shell length) estimated at the time of the survey in the main areas of the Northland commercial fishery since 1992. The same dredge efficiency correction (64%) has been assumed for all sizes and years. Totals include data from all surveyed beds and are not directly comparable among years. Asterisks (*) indicate unreliable results, dashes (-) indicate no survey. Surveys in 2002 and 2003 were completed very close to the start of the season, and are positively biased compared to other years.

Year	Spirits	Rangaunu	Doubtless	Whangaroa	Cavalli	Bream	Pakiri	Total
1992	-	7.0	0.7	-	0.4	16.8	4.0	28.9
1993	-	*1.5	0.7	1.7	0.4	5.5	-	*9.8
1994	-	8.5	1.3	0.6	-	4.2	0.2	14.8
1995	-	9.0	1.0	2.3	1.2	3.5	0.1	18.2
1996	24.4	7.7	0.3	1.2	0.9	2.2	-	37.6
1997	15.8	9.9	0.7	1.1	0.7	*5.7	0.4	35.3
1998	4.7	6.0	0.3	0.5	0.9	0.2	<0.1	14.0
1999	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-
2001	5.4	6.6	0.0	0.1	-	1.1	-	13.2
2002	10.5	9.3	-	0.1	-	5.4	-	26.6
2003	8.3	7.5	0.1	0.4	0.0	1.6	-	18.0
2004	-	-	-	-	-	-	-	-
2005	4.9	7.2	-	-	-	46.7	4.9	66.1
2006	3.0	12.3	-	-	-	51.0	5.5	71.8

NB. For 2006, other areas (Doubtless Bay, Whangaroa, Cavalli Islands) that have supported commercial scallop fishing and have been surveyed in previous years, were not surveyed in 2006 as quota owners believed scallop numbers were likely to be low in these areas.

- 4 The estimates (Table 2) indicate that there has been a further improvement in the number of scallops for 2006. The improvement is most pronounced for Bream Bay since 2000. However, the biomass has also improved over historical average levels for Rangaunu Bay and Mangawhai / Pakiri. The total survey estimate for 2006 (75 million) is considerably larger than all previous survey estimates which ranged from 10 million (1993) to 66 million (2005).
- 5 For 2006, the total greenweight biomass (100mm+ scallops) can be calculated by multiplying the estimate of the numbers of scallops by the average weight of a scallop (111.9 grams) at the time of the survey. This provides an estimate of 8,340 tonnes allowing for historical average dredge efficiency. A more sophisticated “re-sampling” analysis produced biomass estimates with statistical distributions with extreme right-hand skews with some CVs in excess of 100%. Due to this extreme variability, the median values were subsequently used for all yield calculations.
- 6 To estimate CAY it is necessary to know the biomass of scallops at the start of the season. The numbers of scallops at length at the time of the survey was projected forward using assumptions concerning growth (determined from previous tagging programmes (mostly in the Coromandel fishery)) and natural mortality (assumed to be $M=0.5$ spread evenly through the year). A non-parametric re-sampling and projection approach resulted in a median estimate of biomass over 100 mm in length of 7,280 tonnes (greenweight) with a high CV of 43%, based on historical average values for dredge efficiency.
- 7 An additional biomass estimation step that is optional is to make an allowance for only that part of the fishery where scallops occur at a density considered viable for commercial fishing. Critical density will differ for various operators involved in the fishery. MFish considers 0.04 m^{-2} (ie. one recruited scallop for each 25 m^2 of seabed) to be the most appropriate critical density for the Northland scallop fishery, as it conforms closest to a catch rate of around 50 kg greenweight per hour. This catch rate is likely to be about the minimum for an economic return from the fishery. An allowance for critical density at 0.04 m^{-2} would reduce the estimate by around 24%.

Current Annual Yield (CAY) calculation

- 8 Using the assumptions of historical average dredge efficiency and a reference rate of fishing mortality of $F_{0.1}$ (MFish standard rate), the CAY is estimated to be 2707 tonnes greenweight for the recruited biomass. It is then necessary to convert the greenweight to meatweight in each re-sampling calculation, as meatweight is the standard unit of measurement used in the Northland scallop fishery. This conversion results in a meatweight CAY estimate of 366 tonnes by using the actual recovery rates from 1995 to 2002 (averaging 13.59%) for extracting the scallop meat from the whole scallop shell in the processing sheds. If an allowance is made for areas of low scallop density at a level of 0.04 m^{-2} , then the CAY would be reduced by about 24%.