INITIAL POSITION PAPER - PROPOSAL TO REVIEW THE TAC FOR THE COROMANDEL SCALLOP FISHERY (SCA CS) FOR 2006

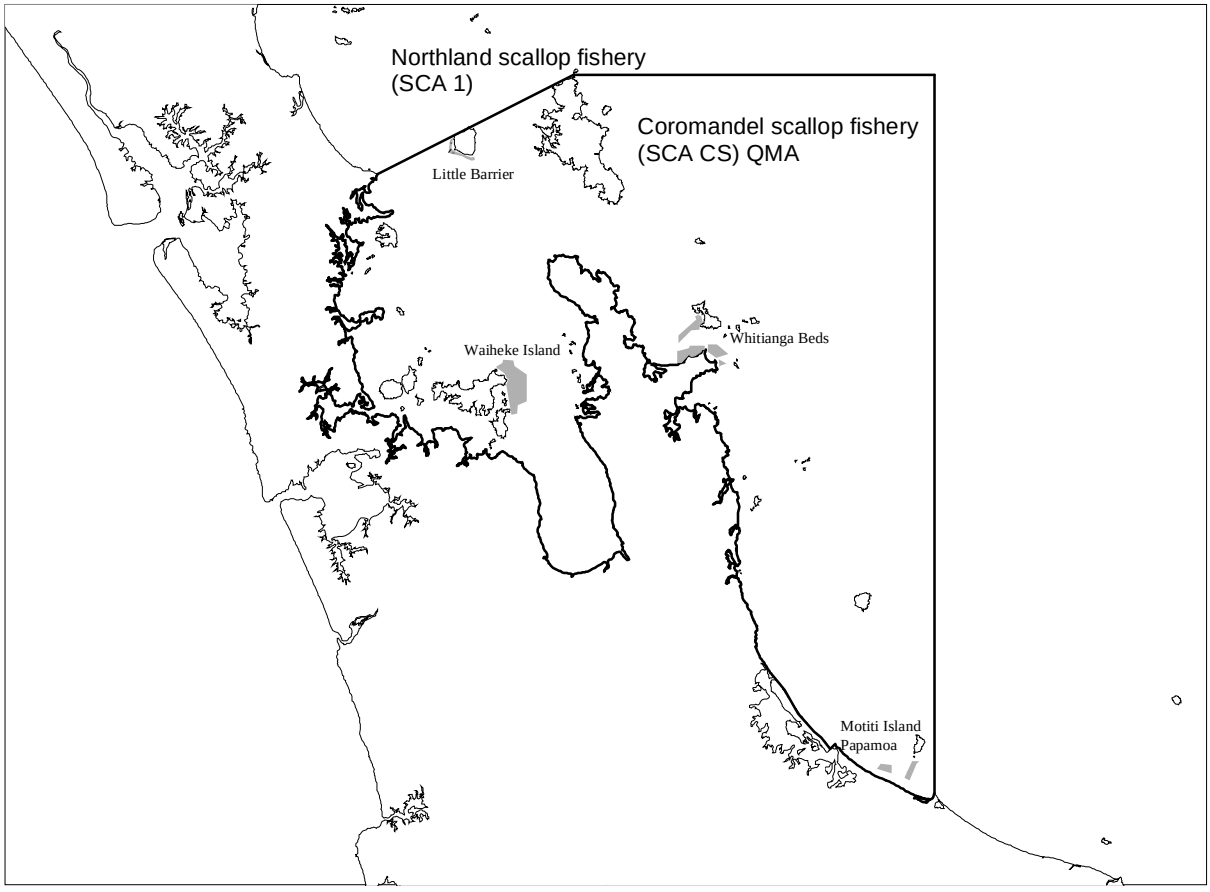


Figure 1: Boundary of the Coromandel scallop (SCA CS) Quota Management Area and the location of the main scallop beds fished by commercial fishers (shaded areas).

Proposal

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

Option 1: Increase the ACE and increase the non-commercial allowances

2 Increase the TAC from 48 to 239 tonnes meatweight, and within the TAC:

a) increase the allowance for recreational fishing from 7.5 tonnes meatweight to 40 tonnes meatweight;

b) increase the allowance for customary Maori fishing from 7.5 tonnes meatweight to 40 tonnes meatweight;

c) increase the allowance for other sources of fishing-related mortality from 11 tonnes meatweight to 41 tonnes meatweight;

d) increase the Annual Catch Entitlement (ACE) from 22 tonnes meatweight to 118 tonnes meatweight; and

e) at the end of the current fishing year for SCA CS, the TAC will revert to 48 tonnes meatweight, the allowance for recreational fishing will revert to 7.5 tonnes meatweight, the allowance for customary fishing will revert to 7.5 tonnes meatweight, the allowance for other sources of fishing-related mortality will revert to 11 tonnes meatweight, and the ACE will revert to 22 tonnes meatweight.

Option 2: Increase the ACE and retain the non-commercial allowances

3 Increase the TAC from 48 to 174 tonnes meatweight, and within the TAC:

a) retain the recreational fishing allowance at 7.5 tonnes meatweight;

b) retain the customary fishing allowance at 7.5 tonnes meatweight;

c) increase allowance for other sources of fishing-related mortality from 11 tonnes meatweight to 41 tonnes meatweight;

d) increase the ACE for quota owners from 22 tonnes meatweight to 118 tonnes meatweight; and

e) at the end of the current fishing year for SCA CS, the TAC will revert to 48 tonnes meatweight; the allowance for other sources of fishing-related mortality will revert to 11 tonnes meatweight, and the ACE will revert to 22 tonnes meatweight.

Management Framework

4 During 2001, the Minister of Fisheries agreed to set a TAC (under section 13 of the Fisheries Act 1996 (the Act)) for SCA CS at 48 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.

5 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 representing a minimum threshold level.

6 The Minister also decided in 2001 to include SCA CS 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. 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.

7 Since 1978, surveys have been used to estimate the abundance of scallops in the Coromandel 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.

8 In making his decision on required services for 2005-06, the Minister agreed to an optional survey for SCA CS during 2006. Quota holders decided that scallop abundance should be assessed during 2006. A research survey was undertaken in May 2006 to assess SCA CS.

9 Section 13(7) recognises that abundance for some stocks can be highly variable between years. S 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.

10 Pursuant to s 13(7), an in-season TAC increase is notified by way of a notice in the NZ *Gazette*, which takes affect from the date specified in the notice. In addition, usually 2-3 days later, FISHSERVE advises quota owners about any change in ACE levels.

11 Section 20(4) of the Act states that the increase of the TAC cannot result in an increase to the total allowable commercial catch (TACC) 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.

12 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. The TAC only 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. The process outlined in the preceding paragraphs has been followed every year since the 2002 season to provide an in-season ACE increase for Coromandel commercial scallop fishers.

Steps in the process to review the TAC

13 To progress this review, MFish proposes the following steps:

- consideration of the survey information about the abundance of scallops in SCA CS during the current fishing year;
- consultation (this paper) with quota holders, tangata whenua, stakeholders and Te Ohu Kai Moana on proposed changes to the TAC, allowances, and ACE for SCA CS;
- 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

14 Scallops (*Pecten novaezelandiae)* inhabit waters to about 60 m deep, but are more common in the Coromandel fishery in depths of 10 to 30 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.

15 *Pecten novaezelandiae* is an 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 commercial minimum legal size limit of 90 mm probably helps to mitigate the risk of recruitment failure, as scallops mature and spawn before reaching the size limit. Scallops 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.

16 Scallops grow rapidly (albeit with considerable variation), have high natural mortality, and exhibit highly variable recruitment. Such a life history results in fluctuating biomass, catch, and reliance on relatively few year-classes.

Fishery characteristics

17 The management arrangements for commercial and non-commercial fishers differ. Extensive parts of the Hauraki Gulf and many inshore scallop beds within SCA CS are closed by regulation to commercial scallop fishing. Therefore, the non-commercial and commercial fishing sectors are separated spatially to a large extent. The main beds in the commercial scallop fishery are found north of Whitianga (at the Mercury Islands), east of Waiheke Island, around Little Barrier, Cape Colville, and in the Bay of Plenty principally around Motiti Island and Papamoa Beach (see Figure 1).

18 There are also differences between the sectors in the minimum legal size limit (90mm for commercial fishers, and 100mm for recreational fishers). The duration of the fishing season is controlled by regulation and also differs: 15 July to 21 December (inclusive) in the same year for commercial fishers; and 15 July to 14 February (inclusive) of the following year for recreational fishers. The commercial and recreational fisheries can also be closed under shellfish sanitation requirements.

19 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. Recreational fishers are restricted to a maximum daily bag limit of 20 scallops per fisher per day in SCA CS.

Commercial fishery

20 The reported commercial catch has varied from 6.6 tonnes (meatweight) in 2000 to 200.0 tonnes (meatweight) in 1987[1] (Table 1). Since 1992, limits on the overall commercial catch have been determined from the results of dredge and dive surveys undertaken before the start of each fishing season. However, the catch limits for SCA CS have often not been caught, notably in 1998, 1999 and 2000 (Table 1).

21 The variability of scallop biomass over short timeframes may be partly responsible for why the catch limits have not always been achieved. 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. Nevertheless, the system may not be entirely random. Prior to 1999, there appears to have been a relationship between scallop recruitment (as measured by catches two years later) and the Southern Oscillation Index (SOI).

22 The SOI is related to changes in ocean temperatures. When sea temperature is colder than normal across the eastern tropical Pacific, the SOI is positive. This pattern is typical of La Niña episodes. North-easterly winds and wet humid weather are typical of a La Niña summer in northern New Zealand. An El Niño summer provides opposite conditions: south-westerly winds prevail, with dry but cooler than average weather. Scallop recruitment appears to be higher during La Niña periods.

23 However, the relationship between scallop recruitment and the SOI was disrupted from 1998, possibly due to the "blackgill" disease and tubeworm outbreak (discussed below) that affected the fishery for three years around 2000. The pattern has been further disrupted in the last two years as fishers have adopted a cautious management approach by accepting low catch levels.

Table 1: Catch limits and landings (tonnes (greenweight or meatweight)) from the Coromandel fishery since 1974. Data before 1986 from Fisheries Statistics Unit (FSU) forms. Landed data are from the landed section of the Catch Effort Landing Return (CELR) forms and from Licensed Fish Receiver Returns (LFRR). "Estimated" data are from the CELR effort section and are pro-rated to sum to the CELR landed greenweight. The estimated catch by sub-areas within the fishery is based on the following scallop statistical reporting areas: "Hauraki" = 2X, 2W; "Mercury" = 2L, 2K; "Barrier" = 2R, 2S, 2Q; "Plenty" = 2A–2I. Catch limits (since 1992) are specified in meatweight ("Green" assumes the gazetted conversion factor of 12.5% and probably overestimates the actual greenweight taken in most years). The catch limits were based on the sum of permit condition entitlements (tonnes meatweight) for 1995 to 2000, a commercial catch limit was set for the 2001 season, and a TACC/ACE level has been set since 2002.

			Landings (t)						
	Catch limits		LFRR	CELR		Estimated catch (t greenweight)			
Season	Meat	Green	Meat	Meat	Green	Hauraki	Mercury	Barrier	Plenty
1974	–	–	–	–	26	0	26	0	0
1975	–	–	–	–	76	0	76	0	0
1976	–	–	–	–	112	0	98	0	14
1977	–	–	–	–	710	0	574	0	136
1978	–	–	–	–	961	164	729	3	65
1979	–	–	–	–	790	282	362	51	91
1980	–	–	–	–	1 005	249	690	23	77
1981	–	–	–	–	1 170	332	743	41	72
1982	–	–	–	–	1 050	687	385	49	80
1983	–	–	–	–	1 553	687	715	120	31
1984	–	–	–	–	1 123	524	525	62	12
1985	–	–	–	–	877	518	277	82	0
1986	–	–	162	–	1 035	135	576	305	19
1987	–	–	200[1]	–	1 431	676	556	136	62
1988	–	–	182	–	1 167	19	911	234	3
1989	–	–	104[2]	–	360	24	253	95	1
1990	–	–	153	–	903	98	691	114	0
1991	–	–	203	–	1 392	472[3]	822	98	0
1992	154	1 232	147	–	901	67	686	68	76
1993	132	1 056	62	–	455	11	229	60	149
1994	66	528	49	–	323	17	139	48	119
1995	86	686	88	79	574	25	323	176	50
1996	88	704	81	80	594	25	359	193	18
1997	105	840	94	89	679	26	473	165	15
1998	110	880	37	19	204	1	199	2	1
1999	31	248	8	7	47	0	12	17	18
2000	15	123	7	10	70	0	24	2	44
2001	22	176	22	20	161	1	63	85	12
2002	35	280	32		204	0	79	12	112
2003	58	464	58		451	63	153	13	223
2004	79	632	79		624	27	333	27	237
2005	118	944	119						

[1] The combined commercial catch for 1987 from the LFRRs is reported as 384 tonnes meatweight, but the Ministry and commercial fishers consider this catch total is unreliable due to catch reporting problems. There were general reporting problems in many commercial fisheries immediately following the introduction of the Quota Management System in 1986. The Ministry considers that 200 tonnes is a more reliable estimate of the commercial catch based on a review of the commercial catch-effort data for that year.

[2] The catch for 1989 may have been under-reported due to mis-recording problems involved with the transition between the Ministry's commercial catch reporting systems in 1989.

[3] The Hauraki Gulf catch for 1991 includes a substantial catch taken from near Colville township (around 45 meatweight tonnes) that was mis-recorded as catch from the eastern Waiheke Island statistical area (2X).

24 The 1999 season was very poor with periods of the season not fished (voluntarily) because of "black gill" condition in the scallops. Commercial dredging was affected between 1998 and 2000 by the spread of the C*haetopterus* tubeworm into some areas. The tubeworm builds large clumps of parchment-like tubes that make dredging for scallops impossible as the dredge fills with tubes, such that the dredge cannot catch scallops. Tubeworms were very rare during the 2006 dredge survey, and were never a hindrance to surveying by filling the dredge.

Recreational fishery

25 Telephone/diary surveys were undertaken during 1993-1994, 1996 and 1999-2000. The recreational harvest estimate from the 1993-94 survey was 8.8 tonnes meatweight. The 1996 survey estimate of the recreational catch was 7.5 tonnes meatweight. The recreational catch estimate from the survey in 1999-2000 was 3.8 tonnes meatweight. The average of these recreational catch estimates is 6.7 tonnes.

26 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 Kawau Island, Omaha Bay, parts of Waiheke Island and the Firth of Thames, Great Mercury Island, Otama Beach, Opito Bay, Slipper Island, and Motiti Island. 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. Some of these closed areas were initially agreed under a three-year plan negotiated by the sectors. In general, the closures are utilisation measures, rather than sustainability measures.

Mäori customary fishery

27 In common with many other shellfish, scallops are important to Mäori as a traditional food. However, no quantitative information on the level of customary take of SCA CS is available. The level of customary catch is unknown. The Minister has set the customary allowance at the level of the recreational allowance. MFish has applied a general criterion that, in the absence of information and where the fishery is of known importance to Maori, the recreational allowance is used as a benchmark to set the customary allowance.

Other sources of fishing-related mortality

28 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.

29 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. Based on this model, an allowance for fishing-related mortality is proposed later in this paper.

Fishery assessment

General methodology

30 The biological reference points 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 even if the number of recruits fluctuates from year to year.

31 Under a dynamic interpretation, CAY is the catch to biomass ratio that maximises the sustainable yield from a fishery over time. It is calculated as a constant proportion of the biomass and 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.

32 The current TAC for SCA CS is 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.

33 Since 1978, 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.

34 The draft report from NIWA for the 2006 survey provided two CAY estimates. The results of the NIWA report, including a comparison between years (Table 2), are summarised in Attachment 1. The first CAY estimate (333 tonnes) includes the "feedback" effects of habitat modification by dredging on juvenile scallop mortality, while the second estimate (488 tonnes) does not include this effect. 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 per hour), then the CAY would be reduced by about 13%.

Environmental Issues

35 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.

36 The history of commercial dredging in the Coromandel scallop fishery dates back to 1968, 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. There is some information available providing evidence of broad-scale changes in benthic communities that can be directly related to fishing. The seafloor in the area has also been modified by the impact of land-based activities over a much longer period. However, significant areas of habitat in the Firth of Thames and inner Hauraki Gulf are not open to commercial dredging.

37 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.

38 Since 1997, populations of the large tubeworm (*Chaetopterus spp.)* have spread throughout the nearshore marine environment in northeastern New Zealand. The taxonomic identity of the tubeworm is still uncertain. 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.

39 The tubeworm affects scallop fishing by clogging dredges, and has impacted on dredging mainly at the beds at Little Barrier Island and Whitianga. In addition to the affect on fishing, the presence of vast numbers of the tubeworm, combined with its rapid spread, has 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 very 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

40 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

41 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 SCA CS 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.

42 MFish notes that there is no current assessment of the entire SCA CS 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 the MSY level.

43 On the 6th of June, MFish emailed to sector leaders a copy of the draft NIWA research report entitled "Dredge survey and stock assessment for the Coromandel scallop fishery, 2006". The report presents the results of the survey carried out in May. Based

on this information, quota-holders considered it appropriate to adopt a cautious approach towards the in-season TAC increase. Quotaholders recommended that the total available ACE should be increased to the same amount (118 tonnes) as in the previous year.

44 The President of the NZ Recreational Fishing Council (RFC) has also commented to MFish on the draft NIWA report. The RFC considered that a pre-cautionary approach should be adopted. The RFC agreed with the catch increase proposed by the quotaholders. The RFC requested that the recreational allowance should be increased by the same proportion as the increase in ACE. The RFC also requested that the amateur daily bag limit should be increased from 20 to 30 scallops per person per day. The RFC considers that the fishery has considerably rebuilt, and that non-commercial fishers are being prevented under a bag limit of 20 from fully accessing the non-commercial share of the fishery.

45 MFish has not received any comments on possible TAC increases from customary Maori, and the environmental sector.

46 MFish proposes that the Coromandel scallop TAC should be increased from 48 tonnes meatweight to either 174 or 239 tonnes meatweight. The proposed TAC increases for both options is largely based on the proposal to increase the total available ACE for commercial fishers for the 2006 season from 22 to 118 tonnes meatweight. As explained below, the difference between the two options is whether or not the allowances for recreational and customary Maori fishing should be increased.

47 At the end of the current fishing year for SCA CS, the proposed TAC, ACE, and allowances would revert to the initial levels at the start of the fishing year.

Allowances and ACE

48 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

49 In considering an in-season TAC increase, and having regard to the matters under s 21, MFish proposes two options for the recreational allowance. Option 1 is to increase the allowance because there has been an increase in the biomass of the scallop fishery. Option 2 is to propose no change due to the lack of quantitative information available on the recreational scallop fishery.

<u>Option 1: Increase the recreational allowance</u>

50 For option 1, MFish notes that the survey results relate primarily to the scallop beds mainly fished by the commercial sector. However, MFish considers that 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 2005-06 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" fishers fishing for

scallops. In addition, it is likely that fishers will more frequently attain their full legal entitlement of scallops ie. the current daily bag limit of 20 scallops per fisher per day.

51 Most of the scallop abundance increase has occurred in the beds near Whitianga and Great Mercury Island (Attachment 1). However, similar to the commercial scallop fishery, the recreational telephone / diary surveys show that the eastern Coromandel area (Cape Colville – Waihi Bluffs zone (see Attachment 2)) accounted for nearly 50% of the recreational scallop catch. From local knowledge, most of the recreational catch reported from the Cape Colville – Waihi Bluffs zone is taken from the Mercury Islands – Whitianga area. The western Gulf zone (primarily the scallop beds inside Kawau Island and around Tiri Island) accounted for around 20% of the recreational catch. Fishery Officers, researchers and experienced local fishers consider that scallop abundance has also significantly improved in this area.

52 In addition, two decisions made by the Minister of Fisheries in late 2005 concerning long-standing management issues relating to the amateur scallop fishing regulations are likely to have increased the recreational catch. The first decision concerned the "primary taker" issue to allow a diver to take a scallop bag limit on behalf of up to two "safety people" on board the vessel during the diving operation. The second decision was to remove the ban prohibiting scallops from being processed ("shucked") at sea.

53 As part of this regulation review, the Minister decided to not agree to the proposal to increase the Coromandel scallop amateur bag limit from 20 to 30 scallops per taker per day. The Minister considered that there is not currently enough information available to support a bag limit increase. He requested the Ministry to obtain further information on the nature and extent of the recreational fishery (including through survey), and the potential impacts of an increase in the bag limit, particularly if the fishery were to enter a period of decline.

54 Given that the recreational catch may increase, it is therefore reasonable to propose an increase in the recreational allowance. Accordingly, for option 1 MFish proposes to increase the recreational allowance by the same proportion as the increase in ACE to commercial fishers. Therefore, MFish proposes to increase the allowance to recreational fishing from 7.5 tonnes meatweight to 40 tonnes meatweight for 2006-07. As part of this proposal, the recreational allowance would then decrease to 7.5 tonnes meatweight at the end of the current fishing year for SCA1 (31 March 2007).

<u>Option 2: No change to the recreational allowance</u>

55 Under option 2, MFish acknowledges that there is a lack of quantitative information available on the recreational scallop fishery. Specifically, no quantitative information is available on scallop biomass in the areas closed to commercial scallop fishing. MFish intends to conduct a research programme over the next 4-5 years to obtain this information. In addition, no quantitative information is available on the recent recreational scallop catch.

56 Without this information, there is no way of knowing whether or not the allowance has been under- or over-caught. Accordingly, under option 2, MFish proposes no change to the recreational scallop allowance and the level would remain at 7.5 tonnes meatweight.

Mäori customary interests

57 In common with many other shellfish, scallops are important to Mäori as a traditional food. However, no quantitative information on the level of customary take of SCA1 is available. MFish has applied a general policy 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.

58 Accordingly, MFish proposes two options for the customary allowance. Option 1 is to increase the customary allowance to the level of the proposed recreational allowance – 40 tonnes meatweight. The customary allowance would then decrease to 7.5 tonnes meatweight at the end of the current fishing year for SCA1 (31 March 2006). Option 2 is to retain the customary allowance at the current level – 7.5 tonnes meatweight.

Other sources of fishing-related mortality

59 The level of incidental mortality expected in the commercial dredge fishery has been calculated by NIWA to be 34.4% of the catch level. Therefore, MFish proposes to increase the allowance for other sources of fishing-related mortality from 11 tonnes meatweight to 41 tonnes meatweight for 2006. A second option for this allowance has not been included because research suggests that incidental mortality from recreational dredging is likely to be minor.

ACE for commercial fishers

60 MFish notes that s 20(4) of the Act does not allow the TACC to be increased 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).

61 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 that the level of ACE for the SCA CS fishery for the 2006 season be increased from 22 to 118 tonnes meatweight.

62 Based on a port price of $16.00 per kilogram of meatweight ($16,000 per tonne), the proposed increase in ACE of 96 tonnes meatweight equates to an increased gross return to the commercial fishers of $1,536,000 for the 2006 season.

Other legislative considerations

63 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 Coromandel scallop fishery. The proposed options are consistent with the obligations relating to the Treaty of Waitangi (Fisheries Claims) Act 1992.

64 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.

65 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 SCA CS. These restrictions are consistent with the overriding 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) five day fishing week and daylight only fishing (reduces fishing intensity);

c) daily catch limits to reduce fishing intensity (Coromandel Scallop Fishermen's Association voluntary initiative).

66 The proposal recognises that biological systems can be inherently variable, and stocks are prone to fluctuations in abundance. This particularly applies to scallop populations.

67 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.

68 Currently, there is no approved fisheries plan for the Coromandel scallop fishery. However, the Ministry and stakeholder leaders are preparing a draft fisheries plan for this fishery. It is intended that the draft 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.

69 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 Coromandel scallop fishery.

70 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 Coromandel 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 Fisheries Act 1996, is consistent with these objectives as it provides for utilisation while ensuring sustainability.

71 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 Coromandel scallop fishery, although these are not considered sustainability measures.

Coromandel scallops Fisheries Plan

72 As indicated above, a Fisheries Plan is currently being prepared for the Coromandel scallop fishery. If the Minister approves the Plan before June 2007, then 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.

Administrative implications

73 There will not be any under- or over-recovery of levies from quota owners specifically relating to the in-season increase in ACE. The amending levy cost allocations will be calculated at the fish stock level using the same information for both the main levy orders (effective 1 October) and the amending levy orders ie. TAC and TACC and the corresponding port price indices. Also, as the final cost allocations to fishstocks are invoiced to quota owners based on quota holdings (total volume of which remains constant), the required revenue should be collected.

Consultation

74 As indicated earlier, prior to the statutory consultation with stakeholders involving this paper as the key document, there has been some preliminary consultation regarding the ACE increase. The 2006 in-season review of the Coromandel scallop TAC is based on the statutory consultation process that has operated for this fishery since 2002. Stakeholders are now familiar with this process.

75 Stakeholders will have around three weeks to Monday 10 July 2006 to provide MFish with written submissions commenting on the management proposals. There will also be a consultative meeting with stakeholders at MFish's Auckland office (1–4pm, Monday, 3 July 2006).

76 The short time for consultation is necessary because of the relatively short commercial fishing season, which closes on 21 December. The issue is that the commercial fishers are able to quickly catch their "baseline" TACC and ACE. If the increased

amount of ACE is then not available, the fishers then have to stop fishing and there is a break in the supply of scallops from the processors. Therefore, any in-season changes to the management measures for SCA CS need to be implemented as early as possible.

Summary

77 The Fisheries Act 1996 imposes an obligation to provide for the utilisation of fisheries resources as long as sustainability is ensured. The proposed management options take into account the research survey information showing high biomass levels for the Coromandel scallop fishery compared to the "average" abundance levels during the 1990s.

78 There is a reasonable level of consensus amongst key stakeholder groups for the TAC to be increased, and in particular, the proposal to increase the amount of ACE from 22 tonnes to 118 tonnes meatweight. This would allow additional utilisation and income to commercial fishers who derive part of their livelihood from this fishery. Two options are proposed for the non-commercial allowances. MFish considers that the proposed measures for the SCA CS fishery are consistent with the purpose and principles of the Fisheries Act 1996 and associated obligations.

Preliminary recommendation

79 MFish proposes two management options.

<u>Option 1: Increase the ACE and increase the non-commercial allowances</u>

a) The TAC for SCA CS is increased from 48 to 239 tonnes meatweight, and within the TAC:

   i) the allowance for recreational fishing is increased from 7.5 tonnes meatweight to 40 tonnes meatweight;

   ii) the allowance for customary fishing is increased from 7.5 tonnes meatweight to 40 tonnes meatweight;

   iii) the allowance for other sources of fishing-related mortality is increased from 11 tonnes meatweight to 41 tonnes meatweight;

   iv) the ACE for quota owners is increased from 22 tonnes meatweight to 118 tonnes meatweight; and

   v) at the end of the current fishing year for SCA CS, the TAC will revert to 48 tonnes meatweight, the allowance for recreational fishing will revert to 7.5 tonnes meatweight, the allowance for customary fishing will revert to 7.5 tonnes meatweight, the allowance for other sources of fishing-related mortality will revert to 11 tonnes meatweight, and the ACE will revert to 22 tonnes meatweight.

<u>Option 2: Increase the ACE and retain the non-commercial allowances</u>

b) The TAC for SCA CS is increased from 48 to 174 tonnes meatweight, and within the TAC:

i) the recreational fishing allowance is retained at 7.5 tonnes meatweight;

ii) the customary fishing allowance is retained at 7.5 tonnes meatweight;

iii) the allowance for other sources of fishing-related mortality is increased from 11 tonnes meatweight to 41 tonnes meatweight;

iv) the ACE for quota owners is increased from 22 tonnes meatweight to 118 tonnes meatweight; and

v) at the end of the current fishing year for SCA CS, the TAC will revert to 48 tonnes meatweight; the allowance for other sources of fishing-related mortality will revert to 11 tonnes meatweight, and the ACE will revert to 22 tonnes meatweight.

Attachment 1: Coromandel scallops stock assessment summary (2006)

1 A research survey of the main Coromandel scallop beds used for commercial fishing was conducted in May 2006. For the overall survey area, a simple "area-swept" analysis suggests there were 31.8 million scallops (with a Co-efficient of Variation (CV) of 10%) at or above a size of 90 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 most 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. The vessel and skipper used for the 2006 survey were the same as used in many of the dredge efficiency experiments in the 1990s. Accordingly, for the 2006 assessment, the historical average dredge efficiency was used, as this most closely relates to the performance of the vessel and skipper used for the 2006 survey. By allowing for average dredge efficiency catch rates, the number of scallops above 90 mm is estimated to be 126.4 million.

3 To allow a comparison of trends over the history of the fishery since 1990, estimates based on scallops 95mm and above are provided (Table 2). The total survey estimate for 2006 (48.6 million (95 mm+ scallops)) is much larger than any previous survey (except 2005) which ranged from 3.3 million (1999) to 33.2 million (2004). There has been about a 15% decline in scallop abundance since 2005. However, MFish is not concerned about this decline because scallop abundance is still considerably larger than during the 1990s. The overall improvement in the last two years is most pronounced for the Whitianga beds, which have historically been the most important scallop beds for the commercial fishery.

Table 2: Millions of scallops (95 mm or larger) estimated at the time of the survey in the main areas of the Coromandel commercial fishery since 1990. Historical average dredge efficiency has been assumed for all years, including 2001–03 when different vessels were used. Totals include data from all surveyed beds and are not directly comparable among years. Dashes (–) indicate no survey in an area or year.

Year	Whitianga / Mercury Is	Waihi Beach	Motiti / Papamoa	Little Barrier	Cape Colville	Waiheke Island	Total
1990	7.4	–	–	–	–	6.4	13.8
1991	11.1	–	–	–	–	2.8	13.9
1992	10.7	–	–	–	–	0.7	11.4
1993	6.6	7.1	–	–	0.3	0.4	14.4
1994	4.8	1.5	–	–	–	0.0	6.3
1995	4.4	0.6	4.5	2.5	0.1	0.3	12.5
1996	6.1	0.2	2.2	3.3	0.1	0.3	12.6
1997	6.1	0.7	1.9	4.0	0.3	5.4	18.4
1998	6.4	0.1	1.2	1.0	0.2	5.3	14.2
1999	1.8	0.2	0.9	0.2	0.0	0.2	3.3
2000	–	–	–	–	–	–	–
2001	1.5	–	0.7	1.6	–	0.2	4.2
2002	2.7	–	0.7	0.8	–	1.0	5.3
2003	4.2	–	2.1	1.4	3.5	1.7	12.9
2004	23.5	1.0	2.4	1.2	0.3	4.7	33.2
2005	53.2	3.7	1.8	2.8	2.5	2.4	66.6
2006	36.3	-	1.8	3.1	7.3	–	48.6

4 At the time of the survey, the total greenweight biomass (90mm+ scallops) can be calculated by multiplying the estimate of the numbers of scallops against the average weight of a scallop (87 grams). This provides an estimate of 10,996 tonnes allowing for historical average dredge efficiency.

5 The biomass of scallops at the start of the season can be estimated by projecting forward the numbers of scallops at the time of the survey, and by using assumptions concerning growth (determined from previous tagging programmes) and natural mortality (assumed to be M=0.5 spread evenly through the year). This approach resulted in a median estimate of biomass over 90 mm in length of 12,203 tonnes (greenweight) with a CV of 21%, based on historical average values for dredge efficiency.

6 An additional biomass estimation step 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 Coromandel scallop fishery, as it conforms closest to a catch rate of 50 kg greenweight per hour. This catch rate is considered by the Coromandel Scallop Fishery Management Committee 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 13%.

7 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 3918 tonnes greenweight. It is then necessary to convert the greenweight to meatweight, as meatweight is the standard unit of measurement used in the Coromandel scallop fishery. This conversion results in a meatweight CAY estimate of 488 tonnes by using the average recovery rate from 1995 to 2002 (12.6%) 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 13%.

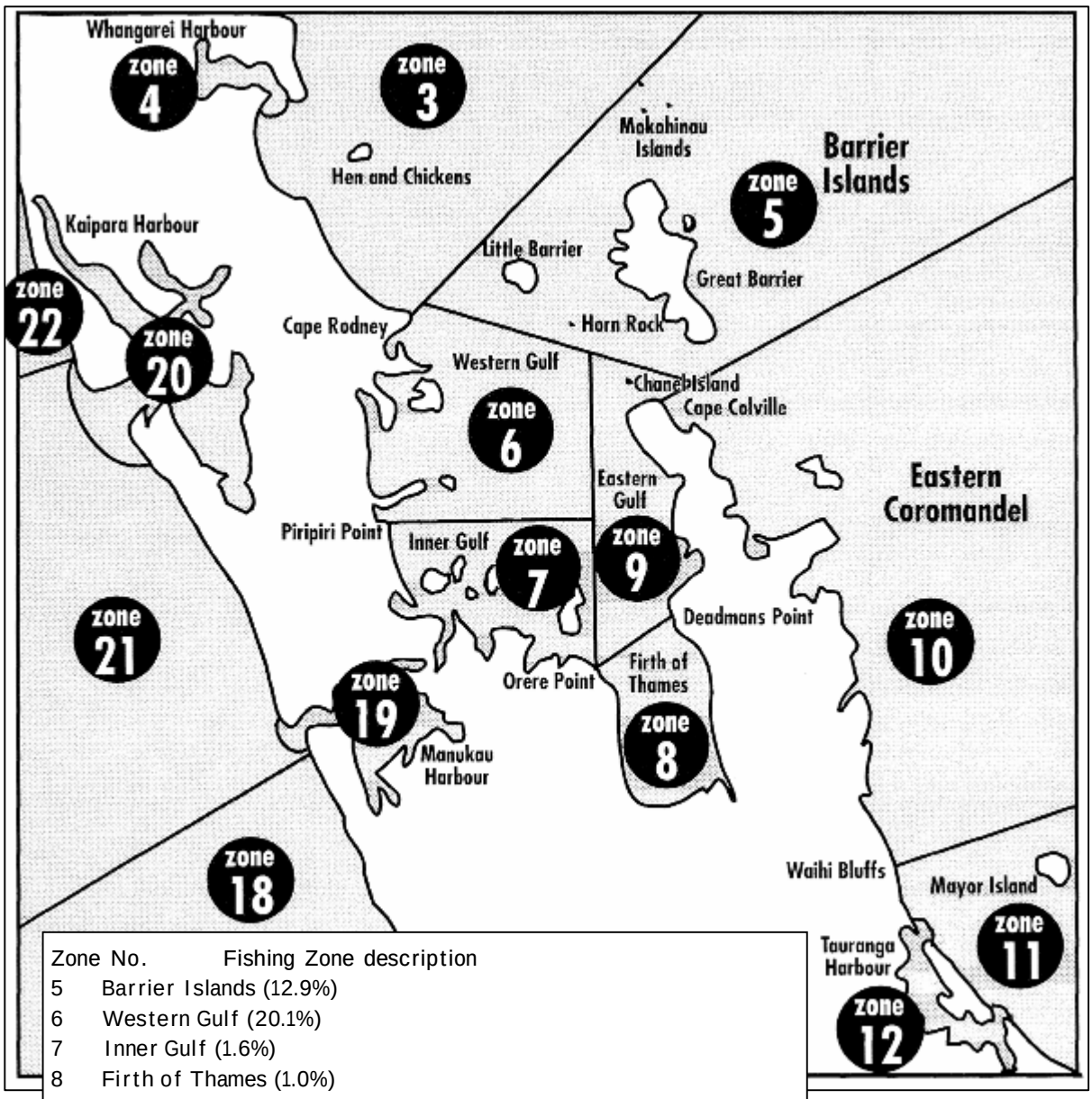
8 Recent modelling work by NIWA on the Coromandel scallop fishery indicates that scallop recruitment could be affected by dredging in two ways. First, through sub-lethal effects of disturbance on adults as they develop gonads prior to spawning. Second, through the destruction and removal of foliose material necessary as spat settlement surfaces. These latter changes could be incremental, as fishing activity gradually decreases the amount of foliose or highly structured material in the environment and, thereby, gradually depresses recruitment.

9 If the indirect "feedback" effects of habitat modification by dredging on juvenile scallop mortality are included, then the CAY is estimated to be 333 tonnes meatweight at $F_{0.1.}$ If an allowance is made for areas of low scallop density at a level of 0.04 m^{-2}, then the CAY could be reduced by 13%.

Attachment 2: Map showing fishing zones used in recreational telephone / diary surveys.

Table 3: Percentage of scallops caught by diarists by zone from the Coromandel scallop fishery. Data are summarised from the five large-scale fishing diary surveys: 1993/94, 1996, 1997, 1999/00, 2000/01.

Zone (see map below for areas)	Percentage
5 Barrier Islands	12.9%
6 Western Gulf (inside Kawau, and Tiri)	20.1%
7 Inner Gulf	1.6%
8 Firth of Thames	1.0%
9 Eastern Gulf to Cape Colville	6.4%
10 Cape Colville to Waihi Bluffs	49.7%
11 Waihi Bluffs to Tarawera River (excluding Tauranga harbour)	8.2%



Zone No.	Fishing Zone description
5	Barrier Islands (12.9%)
6	Western Gulf (20.1%)
7	Inner Gulf (1.6%)
8	Firth of Thames (1.0%)
9	Eastern Gulf (6.4%)
10	Cape Colville to Waihi Bluffs (excluding Mayor Island) (49.7%)
11	Waihi Bluffs to Tarawera River (excluding Tauranga Harbour) (8.2%)