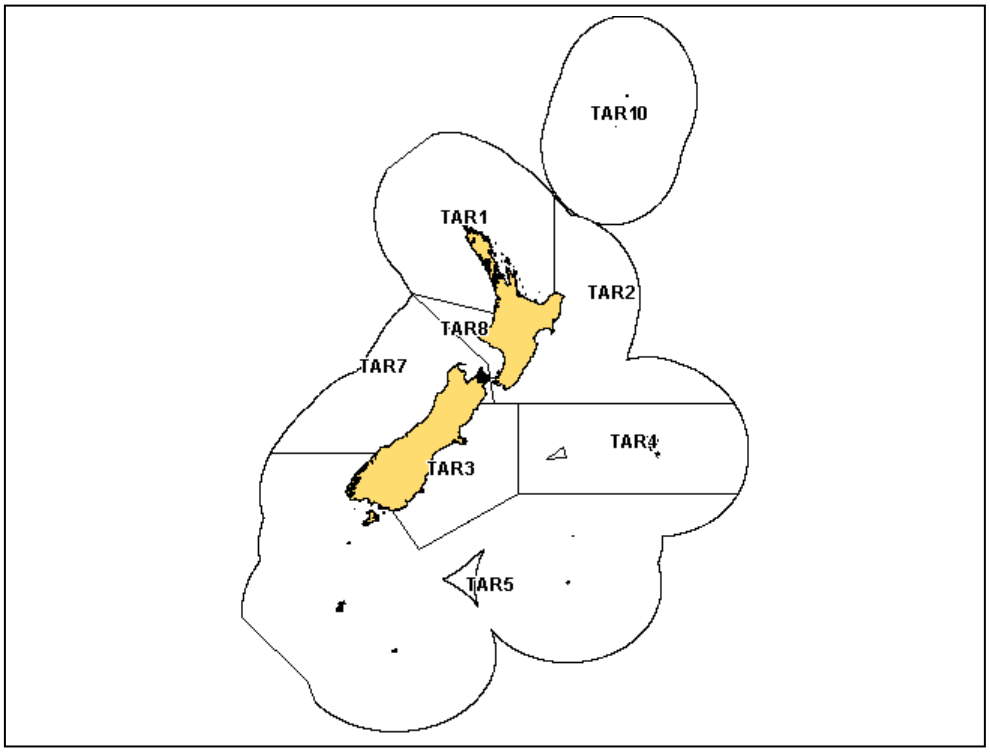
TARAKIHI – (TAR 1)

Figure 1: Map showing Quota Management Areas for Tarakihi (TAR) stocks



Executive Summary

1 TAR 1 has been managed under a TAC since 2002. Commercial Stakeholder Organisations (CSOs) have made applications previously for an adaptive management program (AMP) to be implemented, the latest of which was received from the Northern Fisheries Management Stakeholder Company Ltd (Northern Fisheries) in March 2007. After confirmation that MFish was not accepting new AMP applications during the current financial year, Northern Fisheries requested that a TAC/TACC increase (as sought under the proposed AMP) be considered in the October 2007 sustainability round.

2 Northern Fisheries believes that a utilisation opportunity exists in TAR 1. Citing stable or increasing CPUE (catch per unit of effort) indices and a long, stable catch history since catch reporting began in TAR 1 in 1983/84, Northern Fisheries proposes that higher catches are likely to be sustainable. Recent catches have exceeded the TACC by up to 10% (averaging 5% over catch during the last 10 years) with no sustainability concerns becoming apparent. The May 2006 Plenary report notes that "current catches and the TACC for TAR 1 appear to be sustainable."

3 However, other than CPUE indices, TAR 1 is a comparatively information-poor fishery. There is little fishery-independent information currently available, with no estimates of stock size or maximum sustainable yield (MSY) available. Two research projects pertaining directly to TAR 1 are

scheduled to begin on 1 October 2007, and these may provide more information for monitoring the stock. They are a CPUE analysis to monitor relative abundance (TAR2007/01 – to be completed within one year) and two years of shed sampling to determine the length and age structure of commercial catches (TAR2007/02 – results from the first year will be available by early 2009). These two projects could form the basis for a formal stock assessment in the near future.

4 TAR 1 is an important shared fishery with strong recreational interest, especially in the Bay of Plenty and East Northland areas. In these areas, recreational fishers have previously noted overlap between commercial and recreational fisheries for tarakihi, though this is disputed by some commercial fishers. Recreational groups have previously opposed AMPs, primarily on the grounds that tarakihi size and availability could be reduced if the TACC were to be increased. Currently, there is no information to indicate whether or not the recreational allowance of 470 tonnes is constraining recreational use. There is little information as to whether or not the customary allowance of 70 tonnes provides for customary use.

5 As a shared fishery, setting a TAC to maintain stock biomass above the biomass level that can produce the MSY is an option available to the Minister. Maintaining the stock at a relatively large biomass is the strategy most likely to deliver the type of tarakihi fishery that would enable non-commercial fishers to derive their best wellbeing from the fishery. A high biomass is more likely to provide abundant fish of a greater average size, as often preferred by non-commercial fishers who are not able to use bulk fishing methods. However, since we do not have estimates of current stock size or maximum sustainable yield as references, the options presented in this paper deal only with small increases in the TAC to recognise the recent levels of reported commercial catch that have been taken in excess of the TACC without giving rise to sustainability concerns.

6 MFish considers that the development of fisheries plans over the coming five years will provide the open forum for stakeholders and tangata whenua to set out their respective management objectives for the TAR 1 fishery, and to explore those with the advantage of the improved information on the stock that should be available then.

7 Despite uncertainty, using the best available information, MFish proposes that the Minister sets the TAC under section 13(2)(a) of the Fisheries Act 1996: to maintain the stock at or above the biomass level that can produce the maximum sustainable yield (B_{MSY}), having regard to the interdependence of stocks. MFish proposes three TAC options for managing the TAR 1 fishery:

- maintaining the current TAC;
- increasing the TAC by 70 tonnes; or
- increasing the TAC by 140 tonnes.

8 Each of these options represents a different level of risk to the underlying stock. The Minister may choose from the three TAC options (but is not necessarily limited to these options), as well as alternative options under any

TAC for determining allowances for customary Maori non-commercial fishing interests, recreational fishing interests, and all other sources of fishing-related mortality before determining the TACC. The options proposed are summarised below. MFish notes that a review of the deemed values[1] for TAR 1 and other stocks is also underway (see relevant section in this paper, and Deemed Value Review paper in this volume). The review of deemed values should ensure that commercial catches are constrained within the TACC to achieve the purposes of the catch balancing regime.

Summary of proposed options

9 **Options 1 a, b and c** propose a status quo approach with retention of the current TAC at 1958 tonnes. MFish considers this to be the most cautious approach in view of the uncertainty and inadequacy of available information (in concert with a review of deemed values), allowing any future TAC review to be informed by research scheduled to begin this year. Given the stable CPUE indices and catch history in the fishery, it is considered probable that the current TAC is sustainable and will likely maintain the stock at a biomass level at or above B_{MSY}. These options are proposed on the grounds that maintenance of the TAC at its current level is unlikely to reduce the stock to a level below B_{MSY} or place sustainability risks on the stock. Within these options, the Minister may choose to retain the current allowances (**1a**); to assign a greater proportion of the TAC to the TACC (**1b**); or to assign a greater proportion of the TAC to non-commercial allowances (**1c**).

10 **Options 2 a, b and c** propose an increase to the TAC of 70 tonnes (5% of the current TACC), in line with the average commercial over catch during the last 10 years. Given the uncertainty in the best available information, these options provide some increased risk (though unlikely to be significant) that the TAC will not over time maintain the stock at a biomass equal to or above B_{MSY}. These options recognise the fact that current total catches are probably sustainable, and increases the TAC to the level of recent actual commercial catches above the TACC. These options could provide extra annual catch entitlement (ACE) for commercial fishers to balance their catch, and could thus reduce the amount of deemed values paid in the fishery. As these options should not result in an increase in overall commercial catch above that recently taken (if supported by the appropriate deemed values), it is unlikely to alter the current nature and extent of this fishery as utilised by non-commercial sectors. Within this option, the Minister may choose to assign the increase proportionally to all sectors (**2a**); to assign the increase to the TACC only (**2b**); or to assign the increase disproportionately to non-commercial sectors (**2c**).

11 **Options 3 a, b and c** propose an increase to the TAC of 140 tonnes (10% of the current TACC), in line with the highest level of commercial over-catch in the fishery since at least 1983/84. These options provide an enhanced utilisation opportunity, at least in the short term, providing for greater overall catch in the fishery and probably reducing deemed value payments provided

[1] A deemed value is the per kilogram price a commercial fisher must pay to the government if annual catch entitlement cannot be obtained to cover catch.

that catches are balanced against the possible greater amount of available ACE. These options inherently pose more risk, relative to options 1 and 2, that the TAC will not over time maintain the stock at a biomass level equal to or above B_{MSY}. It is also not known whether or not this level of catch is likely to be sustainable in the long term. Within these options, the Minister may choose to assign the increase proportionally to all sectors (**3a**); to assign the increase to the TACC only (**3b**); or to assign the increase disproportionately to non-commercial sectors (**3c**).

12 Approximate TACs, TACCs, and allowances for the above options are presented in the following table (Table 1):

Table 1. Proposed management options for TAR 1

	Allowance Approach	TAC	Recreational Allowance	Customary Allowance	Other sources of mortality	TACC
Option 1. TAC unchanged	a. Status quo	1958	470	70	20	1399
	b. Non-proportional allocation to TACC	1958	410	59	20	1469
	c. Non-proportional allocation to non-commercial sectors	1958	539	80	20	1329
Option 2. TAC increase of 70 tonnes	a. Proportional	2028	487	73	21	1449
	b. Non-proportional allocation to TACC	2028	470	70	20	1469
	c. Non-proportional allocation to non-commercial sectors	2028	499	75	21	1433
Option 3. TAC increase of 140 tonnes	a. Proportional	2098	505	76	21	1498
	b. Non-proportional allocation to TACC	2098	470	70	20	1539
	c. Non-proportional allocation to non-commercial sectors	2098	530	80	21	1469

Rationale for management options

Background

Main characteristics of the fishery

13 The 2006 Plenary report states that tarakihi are caught in coastal waters of the North and South Islands of New Zealand, as well as the Chatham Islands and Stewart Island. The main commercial fishing target method is trawling. Major target trawl fisheries are in 100 – 200 metre depths. The overall fishery for tarakihi (all stocks) appears to have been relatively stable since initial development. Similarly, the commercial catch in TAR 1 has been relatively stable since at least 1991-92.

14 The 2006 Plenary report states that, in the North Island fisheries, about 70 – 80% of tarakihi commercial catch is taken by target trawling. In TAR 1, some quantity is also taken as a bycatch in trawls targeting several other species (including trevally, snapper, and John dory). Relatively small quantities are taken as a bycatch by other commercial methods (including lining) (Fisheries Information System May 2007).

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

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

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

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

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

Information on stock size and maximum sustainable yield (MSY)

20 There is no formal stock assessment for TAR 1 to provide estimates of stock status with respect to B_{MSY}, nor estimates of the MSY. Thus, most information currently available about TAR 1 is derived from the commercial fishery; particularly from catch per unit effort (CPUE) data.[2] While there is often uncertainty associated with CPUE data, the 2006 Plenary report concluded that CPUE indices are probably monitoring tarakihi abundance in TAR 1.

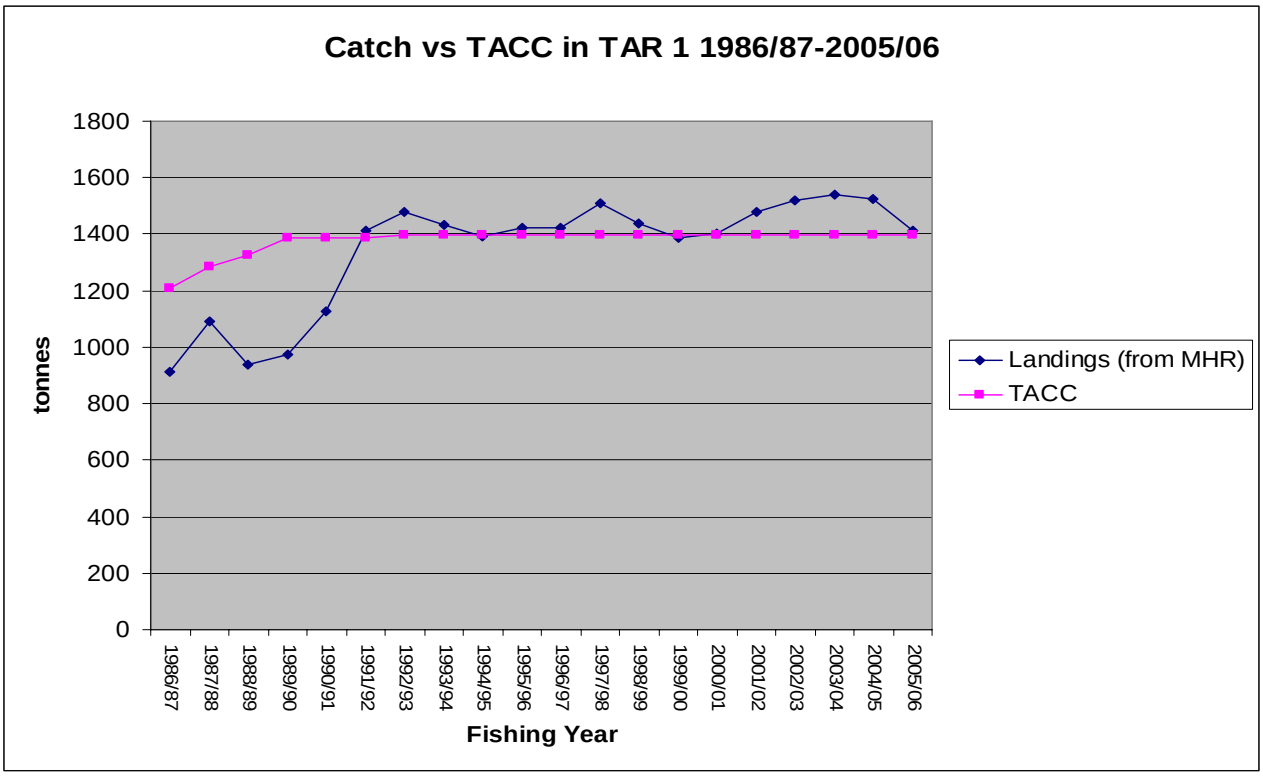
21 The 2006 Plenary report notes that CPUE indices for East Northland and the West Coast North Island fisheries (available for the period 1989-90 to 2003-04) show no trend between 1989/90 and 2003/04; and that CPUE in the Bay of Plenty was stable until 1999-00 when a sharp increase occurred, possibly as a result of good recruitment in 2000-01. Overall, the available CPUE indices in TAR 1 (until 2003-04) are stable or increasing slightly. CPUE indices are to be updated again in 2008. The 2006 Plenary report states that current commercial catches and the TACC appear to be sustainable. The 2006 Plenary did not comment on the TAR 1 stock's biomass in relation to B_{MSY}.

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

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

23 Taken together, these data suggest that increasing the TAC to reflect recent over-catch is likely to be sustainable.

Figure 2: Recent catch vs. TACC in TAR 1



Over catch of the TACC

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

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

26 Some fishers have, in several years, reported substantial quantities of TAR 1 as both target and bycatch. Fishers have balanced a large portion of that catch

with ACE, but have also paid deemed values for further substantial quantities. It appears that those fishers have not found the current deemed value rates for TAR 1 to be a disincentive to catching well in excess of the available ACE. It is also evident that ACE prices can exceed the annual deemed value rate, weakening any incentive to obtain ACE or attempt to constrain catches.

27 The Ministry is reviewing the deemed value rates for TAR 1 (and other adjacent TAR stocks - see relevant section of this volume) with a view to setting the rates at appropriate levels to achieve the purpose of the catch balancing regime. Altering the individual over catch threshold at which ramping of deemed values begins is an option being considered to constrain over fishing.

AMP proposals in TAR 1

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

Key points to consider

29 The current stock size of TAR 1 in relation to B_{MSY} is not known, and neither are any estimates of the MSY.

30 The primary driver for this review is that the TACC has been fairly consistently exceeded for a number of years. The relatively stable commercial catch levels and indices of relative abundance (CPUE) available through to 2003-04 possibly support industry's view that the stock can provide for further sustainable utilisation above the current TAC. The CPUE indices will be updated in 2008. The 2006 Plenary report states that current catches and the TACC appear to be sustainable.

31 However, TAR 1 is a shared fishery, of importance to both customary and recreational fishers. Surveys to estimate recreational catches in 1996 and 1999-00 showed that the catches in TAR 1 were substantially larger than tarakihi catches in any other area. The 2006 Plenary report notes that the recreational catch estimated from the 1999-00 survey was 46% of the commercial catch in that period. As a shared fishery, setting TACs to maintain the stock above the B_{MSY} level is a valid objective. MFish notes also that the Auckland and Tauranga areas are experiencing substantial growth in human population. It is possible that an increasing regional population would be accompanied by increasing recreational interest in fishing for TAR 1 as well as increasing demand for the product by regional consumers.

32 In previous submissions on proposed AMPs in TAR 1, recreational interests expressed concern that an increase to commercial catch would impinge upon

both the size and availability of tarakihi to recreational fishers. This was seen as particularly important in the areas where commercial and recreational interests are thought to overlap, primarily in the Bay of Plenty and East Northland areas. This was a contentious issue between commercial and non-commercial sectors in previous AMP applications in TAR 1.

33 With the exception of options **3a and 3b**, the options proposed in this paper would not see authorised commercial catch exceed recent actual catch levels (taken as the 10 year average of commercial landings) by more than 6 tonnes. If any of the options (other than **3a** and **3b**) were implemented, MFish considers that non-commercial sectors would be unlikely to see the nature and extent of their TAR 1 fishery reduced. If either options **3a** or **3b** were implemented, there is a greater risk of affecting the nature and extent of the fishery available to non-commercial sectors compared to the other options, though the level of this risk is unknown. This is because while catches of up to 1541 tonnes (10% in excess of TACC) have been recorded in TAR 1, they have not been sustained over time, and it is not known if they would be sustainable.

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

Hauraki Gulf Marine Park Act 2000

35 In setting a TAC, the Minister is required to have particular regard to s7 and 8 of the Hauraki Gulf Marine Park Act 2000 in so far as the decision relates to the Hauraki Gulf. Section 7 recognises the national significance of the Hauraki Gulf including its capacity to provide for the relationship of tangata whenua and the social, economic, recreational, and cultural well-being of people and communities. Section 8 sets out the objectives of the management of the Hauraki Gulf, which include the maintenance of the Hauraki Gulf for the social and economic well-being and its contribution to the recreation and enjoyment of the people and communities of the Hauraki Gulf and New Zealand. The maintenance and enhancement of the physical resources of the Gulf, which include tarakihi, is also an objective.

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

37 MFish understands that the bulk of nationwide landings of tarakihi (approximately 6 000 tonnes) is sold on the domestic market and that it is a

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

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

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

40 MFish invites submitters to provide any additional information that they have on the importance of tarakihi to the social, economic, recreational and cultural wellbeing of people in the area of the Hauraki Gulf Marine park.

Assessment of management options

Total Allowable Catch

41 MFish proposes to set the TAC for TAR 1 under section 13(2)(a) of the Act. Section 13(2)(a) is appropriate in cases where the stock biomass is at or above the B_{MSY} level and requires a TAC that maintains a stock biomass at or above a level that can produce the maximum sustainable yield, having regard to the interdependence of stocks.

42 The 2002 Plenary reported the view that the TAR 1 biomass was probably above the level that can produce MSY at that time. The currently available CPUE indices for TAR 1 (until 2003-04) are stable or increasing slightly, and commercial landings have been relatively stable for more than 15 years. Based upon that information, there is a reasonable probability that the current TAR 1 biomass is equal to or greater than the size that can support the MSY. However, estimates of current biomass or the biomass that can support the MSY for TAR 1 are not available, hence it cannot be reliably determined whether or not the proposed TAC options will maintain the stock at a size that will support MSY.

43 In the absence of reliable estimates of biomass and maximum sustainable yield for TAR 1, MFish proposes two options to vary the TAC based on assessment of past and current catches and allowances.

44 Three TAC options are proposed as set out in Table 1. The first represents the status quo as it is based on existing catch limits and allowances for customary and recreational catch and for other fishing-related mortality. The remaining two options propose TACs that reflect recent commercial landings and provide for increased utilisation opportunities in the fishery.

Option 1

45 In the absence of definitive information to support a TAC increase, **option 1** represents the most cautious approach by maintaining the TAC at the status quo level, if considered in conjunction with a review of deemed values to ensure better compliance with the TACC.

46 The current TACC was set in 2001 and reflects the level of previous catches in the fishery. The current TAC and allowances have been in place since 2003. The TAC was set following considerations of the combined recreational allowance (set at 470 tonnes, the mean of the 1996 and 1999/2000 recreational harvest survey point estimates), the customary catch allowance (set at 70.5 tonnes – 15% of the estimated recreational catch – on the basis of similar allowances in snapper fisheries), and the allowance for other sources of fishing-related mortality (20 tonnes). There are no more recent estimates of non-commercial catches of TAR 1.

47 Maintaining the TAC at 1958 tonnes recognises the fact that the present level of fishing is unlikely to: risk the long-term sustainability of the fishery; significantly alter the ability of fishers from any sector to derive wellbeing from the fishery; or give rise to any other sustainability concerns.

48 MFish considers the status quo option is least likely to alter the existing overall social, cultural, and economic factors associated with the fishery.

Option 2

49 **Option 2** proposes an increase of 70 tonnes to the TAC, recognising the average commercial catch over the last 10 years. This option would set a TAC of 2028 tonnes, and provides for the average recent commercial over-catch within the fishery.

50 Catches have averaged approximately 70 tonnes in excess of the TACC for the previous 10 years. The 2006 Plenary report states that current catches and the TACC appear to be sustainable. The relative stability of the CPUE indices and catch levels suggests that biomass remained relatively stable under those catches (at least until the the most recent CPUE indices for 2003-04). A major advantage of recognising recent commercial catches in an increased TAC and TACC level is that it could provide an opportunity for better value to be realised, through increased availability of ACE and a consequent reduction in deemed value payments.

51 MFish considers the TAC proposed under this option is also unlikely to alter the existing overall social, cultural, and economic factors associated with the

fishery, because the option recognises the average actual catches that have been taken as evidenced by the available information.

Option 3

52 Under **option 3**, the TAC would be increased by 140 tonnes, in line with the greatest recorded commercial catch in the fishery since at least 1983/84. This would see a total allowable catch of 2098 tonnes, meaning this option provides for the greatest utilisation opportunity.

53 However, catches at this level (or slightly lower) have not occurred consistently, and it is not known whether or not they are sustainable in the long term. Though the information on stock size is very uncertain, MFish also considers that this option provides the most risk of the three options proposed that the TAC will not maintain the stock at a biomass equal to or above B_{MSY} over time. Thus, this option inherently presents more risk to the sustainability of the stock than the options listed above.

54 Quantifying the risk posed by this option is difficult given the lack of information currently available in this fishery. However, an increase of 140 tonnes is not much greater than actual commercial catches, which have exceeded the TACC by an average of 96 tonnes (7%) per year over the past five years. While an element of risk exists under this option, given the catch levels already occurring in the fishery, an increase of 140 tonnes is unlikely to pose an undue risk that the stock will not be maintained at a level that can produce MSY or to the sustainability of the stock, at least in the short term and provided that catches are constrained to the TACC.

55 MFish considers this option is associated with the greatest increased utilisation opportunity in the short term and hence carries the greatest short-term potential to obtain greater value from the fishery. However, it also carries a risk that it could adversely affect the nature and extent of the fishery available to non-commercial fishers.

Determining allowances and setting the TACC

56 Section 21 of the Fisheries Act 1996 requires the Minister to allow for Maori customary non-commercial catch, recreational catch, and other sources of fishing-related mortality before setting the total allowable commercial catch. In setting allowances and the TACC, the Minister should consider how best to provide for the social, economic and cultural wellbeing of the persons within each sector.

57 Within each of the TAC options above, the Minister has a range of options with which to distribute any increase (or change existing allowances). In broad terms, these options are:

- proportionally set the allowances (any increase is assigned across the sectors in the same proportions as currently used to manage the fishery);

- non-proportionally assign any increase to the commercial sector (only the TACC is increased, with recreational and customary allowances remaining unchanged); or
- set non-proportional allowances – an example being to assign to non-commercial sectors 50% of any increase (shared in proportion to existing allowances),[3] and 50% to the TACC.

58 Proportionally increasing the TACC and allowances above the status quo theoretically spreads the benefit of the increased catch level between all three sectors. In TAR 1, this would result in non-commercial allowances in excess of the currently used estimate of non-commercial catch. MFish recognises that the available estimates of non-commercial catch of TAR 1 are uncertain and only infrequently updated. Given the relatively small proposed changes in TACs and allowances, and the uncertainty in non-commercial catch levels, the potential benefit to that sector cannot be determined reliably.

59 Under a non-proportional approach, the Minister may choose to make a greater share of any increase available to the TACC (and thus, to the commercial sector). Assigning a greater share (or the total amount) of any TAC increase to the TACC could recognise that only an increase to the commercial sector is likely to have a tangible impact on utilisation. As consistent commercial over catch in the fishery has revealed a potential utilisation opportunity, it may be appropriate that any increase is assigned to the TACC.

Customary

60 Little is known about the extent of customary catch of tarakihi. While tarakihi is known to have value as a customary food source, recent and current harvest levels are unknown. Thus, there is no information presently available to suggest that the current allowance of 70 tonnes does not provide for customary catch. MFish looks forward to submissions from the customary sector which could help characterise the value of this fishery to Maori. Moreover, MFish encourages any suggestions toward improving quantification of customary catch.

61 The Minister must take into account any mātaitai reserve and any closure, method restriction, or prohibition imposed under s 186A. There are existing mātaitai reserves and closures under s 186A within the boundaries of TAR 1 (see paragraph 91 for details), however, MFish does not consider that any of these materially affect the management of TAR 1 at this time. Those measures are designed to manage fisheries within relatively small spatial areas and are unlikely to significantly influence the allocation of a fishery such as TAR 1.

Recreational

[3] 50% is a notional figure used to illustrate one possible approach to non-proportional allocation to non-commercial sectors. The Minister may choose a different figure in order to better allow for appropriate allocation between sectors.

62 Tarakihi is an important fish to recreational fishers, and is actively targeted in many areas. According to both the 1996 and 1999-00 recreational harvest surveys, TAR 1 is the most important tarakihi fishery by weight. It was also estimated to be the 4th most important recreational fishery nationally (of any fish species, by weight) in the 1996 recreational harvest survey and 9th most important in the 1999-00 survey.

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

64 MFish currently has no information to suggest that the existing allowance for the recreational sector is constraining recreational fishers' interests in TAR 1. However, MFish looks forward to submissions from the recreational sector that can provide further information towards characterising the value of the fishery to the sector and any concerns or issues they may have with regard to this fishery.

65 If the recreational allowance is increased or decreased, MFish intends to consider reviewing the daily recreational bag limit for tarakihi. The only option presented proposing a reduction to the recreational allowance is **option 1b**. MFish's preliminary view is that if **option 1b** is chosen, then it would be appropriate to consider a reduction in the daily bag limit in order to assist with constraining catch to a reduced recreational allowance. However, if the recreational allowance is increased, MFish's preliminary view is that any change to the daily recreational bag limit is unlikely to be necessary. There is no information available to suggest that up to 20 tarakihi (tarakihi is included in the 20 mixed-species bag limit) is insufficient in providing for the needs of recreational fishers. An increased allowance would likely authorise the taking of more daily bag limits.

66 The Minister must take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made under section 311 of this Act. There are no such regulations prohibiting or restricting fishing within TAR.

Other sources of mortality

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

68 MFish considers that the allowance for other sources of mortality should be increased in proportion to any increase in the TACC and allowances. As there is no new information to suggest a change in the proportion of the TACC

estimated to account for other sources of mortality in the fishery, MFish considers it should be set at approximately 1.5% of the TACC.

TACC

69 The TAR 1 fishery is valuable to commercial fishers, both on the domestic market and as an export. The bulk of the national tarakihi catch is sold in domestic markets, and it is popular with consumers nationally. In addition to strong domestic demand for tarakihi, approximately 116 tonnes (2006 calendar year as an example) from all TAR stocks nationwide are exported annually, mostly to Australia. Export prices vary widely ($ 1.51/kg to $25.08/kg) according to product states (chilled or frozen as either fillets or whole fish). At the average export price of approximately $5.61/kg, the FOB value of the 2006 exports was $ 650 161.00. When compared to $7.04/kg for the traditionally high-value snapper, tarakihi is clearly a valuable fish to the commercial sector.

70 TAR 1 quota is owned by 79 individuals or entities. Quota ownership is concentrated, with the top three quota owners holding 72% of all available quota. The top 10 quota holders own 92% of all quota for TAR 1.

71 MFish looks forward to industry submissions providing more information on the value of tarakihi caught in TAR 1 to the commercial sector.

Proposed options

72 Under sections 20 and 21 of the Fisheries Act 1996, once the Minister has decided a TAC setting and considered the factors mentioned above, he must determine allowances and a TACC for TAR 1. The following options are proposed as representative of the options available to the Minister. The Minister is not, however, limited to the following options:

Option 1: TAC set at current level of 1958 tonnes:

- **Option 1a** reaffirms the status quo. It would leave all allowances at the current levels (as there is no increase to the TAC to assign between sectors). This option assumes that the current allowance and TACC settings enable people to adequately provide for their social, cultural, and economic wellbeing, and are not constraining any individual sector unnecessarily.

- **Option 1b** is open to the consideration that the current recreational and customary allowances are higher than necessary to provide for these sectors' wellbeing. This option proposes that 70 tonnes (the ten-year average commercial over-catch) be moved from these sectors and assigned to the TACC.

  This option might provide some economic benefit to the commercial sector through a probable reduction in deemed value payments (the potential extra commercial value based on average port price of $ 2.00/kg would be $ 140 000.00 – and recognising that port price is only a relative indicator of commercial value), but it would also see the recreational allowance drop below the currently used best estimate of recreational harvest. This option risks setting non-commercial allowances that do not provide adequately for customary and recreational interests to derive wellbeing from the fishery.

- **Option 1c** provides for the consideration that the current TACC is set too high with respect to recreational and customary allowances in the fishery. This option proposes to recognise the importance of this fishery to recreational and customary interests by moving 70 tonnes from the TACC and assigning these (in current proportions) to the recreational and customary sectors.

  This option could better recognise the importance of the TAR 1 fishery to the recreational and customary sectors, and could enable these sectors to better provide for their wellbeing. However, it would only do so at a cost to the commercial sector.

Option 2: TAC increased to 2028 tonnes

- **Option 2a** is based on the consideration that the current proportions are an appropriate division of the resource between the three sectors. This option

would assign the extra 70 tonnes in the TAC between the three sectors according to the current proportions.

This option would provide some additional allowance to all sectors in the same proportions as are currently used to manage access to the resource. The potential benefits under this option are clear for the commercial sector, as it is most likely to take any increase allowed (the potential extra commercial value based on average port price of $ 2.00/kg would be $ 100 000.00). Any real benefit to the non-commercial sectors is difficult to determine.

- **Option 2b** assumes that the current recreational and customary allowances meet the needs of those sectors, and thus do not need to be increased. Under this option, the extra 70 tonnes in the TAC would all be used to increase the TACC to approximately 1470 tonnes.

  This option would benefit the commercial sector by increasing quotas and possibly reducing deemed value payments in the TAR 1 fishery (the potential extra commercial value based on average port price of $ 2.00/kg would be $ 140 000.00). This option is unlikely to disadvantage non-commercial sectors as it neither decreases their allowances nor provides for any additional commercial catch that has not been taken in recent years; rather, it recognises the average recent commercial catch levels already occurring in the fishery.

- **Option 2c** is based on the consideration that better overall social, cultural, and economic wellbeing could be realised in the fishery if recreational and customary fishers were awarded a greater share of the 70 tonne increase than current proportions allow. This option would see 35 tonnes split between the recreational and customary sectors, with 85% of this awarded to the recreational sector and 15% to the customary sector (according to the current ratio between the two non-commercial sectors). The remaining 35 tonnes would be used to increase the TACC to approximately 1433 tonnes (the potential extra commercial value based on average port price of $ 2.00/kg would be $ 70 000.00).

  This option would increase the non-commercial allowances by a greater amount than current proportions. While these additional allowances might not be utilised immediately (or at all), this option could help non-commercial fishers to better provide for their well-being. However, the proposed increases are small, and any improvements in the nature of the fishery could be difficult to detect. This option also benefits commercial fishers by creating more ACE and possibly reducing deemed value payments. However, it does not fully provide for the average commercial over-catch in the fishery during the last 10 years.

Option 3: TAC increased to 2098 tonnes

- **Option 3a** is based on the consideration that the current proportions are an appropriate division of the resource between the three sectors. This option

would assign the extra 140 tonnes in the TAC between the three sectors according to the current proportions.

This option would provide any benefit to all sectors in the same proportions as are currently used to manage access to the resource. The potential extra commercial value based on average port price of $ 2.00/kg would be $ 200 000.00.

- **Option 3b** assumes that the current recreational and customary allowances meet the needs of those sectors, and thus do not need to be increased. Under this option, the extra 140 tonnes in the TAC would all be used to increase the TACC to approximately 1540 tonnes (the potential extra commercial value based on average port price of $ 2.00/kg would be $ 280 000.00).

  This option would benefit the commercial sector by providing an additional (possibly short-term) utilisation opportunity. It would create additional ACE in the fishery and should reduce deemed value payments if catches are constrained to the TACC. This option could disadvantage non-commercial sectors if the increased commercial catches reduce the size and availability of tarakihi to these sectors.

- **Option 3c** assumes that better value could be realised in the fishery if recreational and customary fishers were awarded a greater share of the 140 tonne increase than current proportions allow. This option would see 70 tonnes split between the recreational and customary sectors, with 85% of this awarded to the recreational sector and 15% to the customary sector (according to the current ratio between the two non-commercial sectors). The remaining 70 tonnes would be used to increase the TACC to 1470 tonnes. This option benefits commercial fishers by providing for current commercial catches in the fishery, whereby creating more ACE and reducing deemed value payments if catches are limited to the TACC (the potential extra commercial value based on average port price of $ 2.00/kg would be $ 140 000.00).

  This option would provide a theoretical benefit to non-commercial sectors through increasing their allowances by a greater amount than current proportions suggest. However, there is no information to suggest that these additional allowances are likely to be utilised by non-commercial fishers. In practise, however, the quantity involved is small and unlikely to make a discernible difference in the short term.

Other Management Measures

Deemed Values

73 A review of the deemed value rates applicable in TAR 1 (among other fisheries) is currently occurring. From the history of over-catch in the fishery, it is apparent that the current deemed value rates have not deterred fishers from exceeding the TACC. MFish considers that deemed value rates should be

set at levels that encourage fishers to obtain ACE to cover their catch, particularly in fisheries where most catch is targeted (such as TAR 1). See the deemed value paper in this volume for more information on changes to deemed value rates in this fishery.

Fisheries plans

74 The Ministry will be working with stakeholders over the next few years to develop fisheries plans for most fisheries. The plan development process will provide an open forum for stakeholders to put forward their respective objectives for the TAR 1 fishery with a view to obtaining best value.

Research

75 Two research projects pertaining directly to TAR 1 are scheduled to begin on October 1 2007, and these may provide more information for monitoring the stock. They are a CPUE analysis to monitor relative abundance (TAR2007/01) and a two-year shed sampling analysis to determine length and age structure of commercial catch (TAR2007/02). The former is projected to be complete within one year and cost up to $25 000, while the latter is expected to be completed by 31 March 2010 and cost between $500 000 - $750 000 - results from the first year will be available in early 2009. These two projects could form the basis for a formal stock assessment in the near future.

76 Data on recreational catches of tarakihi within Quota Management Area 1 were collected for much of the 2004-05 fishing year. The analysis of those data to estimate recreational catch of tarakihi in that year should be available later in 2008.

Compliance

77 ACE for TAR 1 has often been unavailable to cover commercial catch. Compliance concerns can arise as in such cases fishers might have incentives to misreport (weights, area, and species) and to discard catch. In part, MFish relies on the incentives that quota provides for commercial fishers to fish the stock in a sustainable manner. More proactively, MFish will rely on monitoring and at-sea surveillance to detect dumping.

78 If the TACC is increased, the availability of ACE should improve, potentially reducing these problems. If the TACC is unchanged and deemed values are raised, the compliance problems might increase.

APPENDICES

Appendix 1

Statutory Considerations

79 **Section 8:** The purpose of the Fisheries Act 1996 is to provide for the utilisation of fisheries resources while ensuring sustainability. Utilisation is defined in the Act as including using and developing fisheries resources. An increase to the TAC, allowances and TACC could increase the value able to be extracted from this fishery, though potentially increasing risk to stock sustainability. The relative stability of past and recent commercial catches and indices of abundance derived from the fishery suggest that those risks are small, at least in the short to medium term. The options outlining an increased TAC, TACC and allowances recognise the development potential of the fishery (as evidenced by catch history and indices of stock abundance), and create the potential for people to provide better for their social, cultural, and economic wellbeing. There are likely to be economic benefits associated with reduced deemed value payments under all but the status quo option. In the case of option three, there would also be economic benefits inherent in a greater commercial catch and this option is likely to have some small positive economic effects on downstream industries such as processing and transport services.

80 **Section 13:** The TAC must be set to move the stock towards a level or maintain it at a level that is at or above the level that can produce MSY. That level has not been determined for TAR 1, as there is no formal stock assessment for TAR 1 to provide estimates of stock status with respect to B_{MSY}, nor estimates of the MSY. The 2006 Plenary does not comment on current stock size, but reports that current catches and the TACC for TAR 1 appear to be sustainable. However, since catches and catch per unit effort have been relatively stable over a long period, there is a reasonable probability that TAR 1 biomass is at or above the level that can produce the MSY. MFish considers that the options presented in this paper are consistent with section 13(2)(a) which requires the TAC to maintain the biomass of the stock at or above the level that can produce MSY. Based on relatively stable catches and CPUE data, MFish considers that the TAC options presented in this paper are likely to maintain TAR 1 at a level which can produce MSY and be sustainable, at least in the short term.

81 In considering the interdependence of stocks, a range of species is caught in the target trawl fishery for TAR 1. The three most significant commercial bycatch species reported in the TAR 1 target bottom trawl fishery in 2005–06 were snapper (9%), barracouta (7%), and hoki (3%) all of which are managed under the QMS with strong incentives to balance catches to the available ACE. There is no information to suggest that the interdependence of stocks should affect the level of the TAC set for TAR 1 at this time.

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

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

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

85 **Section 5(a) and 5(b):** There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers that the section 5 considerations arising from New Zealand's international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed by management proposals for TAR 1. MFish is not aware of any issues concerning those international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 that will result from the proposed TACs, TACCs and allowances.

86 **Section 11 (1)(a)**: The Minister must take into account any affects of fishing on any stock and the aquatic environment in his decision. Tarakihi are taken in a target trawl fishery and in substantial quantities as a by-catch of target trawling for other inshore species including snapper. Tarakihi are also taken by various other commercial fishing methods. Bottom trawl gear affects the physical structure of the substrate and possibly the benthic community structure. Target trawling occurs throughout TAR 1, largely between the 100 and 200 metre depth contours. Due to ease of catch and proximity to processors, commercial fishers are likely to continue fishing in the same fishing grounds, and so effects are likely to be restricted to areas that have been trawled previously. Despite that, fishing might still have adverse effects. The extent of those effects is not known. Nevertheless, MFish considers that restricting any adverse effects of fishing to existing trawl areas is not inconsistent with the obligation to provide for the utilisation of fishery

resources while ensuring sustainability. No other information about any effects of fishing on any stock or on the aquatic environment is considered relevant to the consideration of sustainability measures for TAR 1 at this time.

87 **Section 11 (1)(b):** The Minister must in his decision take into account any existing controls that apply to the stock. Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls for TAR 1 include the following:

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

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

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

88 **Section 11 (1)(c):** The Minister must in his decision take into account the natural variability of the stock. It is not known if tarakihi are prone to significant fluctuations in biomass. Although recruitment is not known to vary much, the 2006 Plenary report states that good recruitment was a likely reason for an increase in the CPUE index for the Bay of Plenty area in 2000-01.

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

90 **Section 11(2A)(a) & (c)**: Before setting or varying any sustainability measure the Minister must take into account any conservation or fisheries service, or any decision not to require such services. MFish does not consider that existing or proposed services materially affect a TAC review for TAR 1. No decision has been made not to require a service that would be relevant to the TAR 1 fishery.

91 **Section 11(2)(a) & (c):** There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for TAR 1.

92 **Section 11(2)(c):** Relatively little target fishing for tarakihi is known to occur within the boundaries of the Hauraki Gulf Marine Park. Nevertheless, the proposals are considered to be consistent with the considerations set out in sections 7 & 8 of the Hauraki Gulf Marine Park Act 2000. Sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 relate to the consideration of the social, economic, cultural and recreational wellbeing of the people of the Hauraki Gulf, and of New Zealand more generally. The proposed TAC options seek to provide for levels of utilisation that will enable people to derive social, economic cultural and recreational wellbeing from the fishery to varying degrees (depending on the option) while ensuring the sustainability of the broader stock. Those considerations are discussed in more detail in the body of the paper.

93 **Section 21(1)(a & b) and (4)(I & ii) and (5):** The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TAC, TACC, and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. One mātaitai reserve exists in the QMA at Raukokere (NABIS May 2007), however, MFish considers that this reserve has little if any effect on the options proposed for TAR 1. Three areas are subject to section 186A closures under the customary fishing provisions of the Act, at Ohiwa Harbour (Green-lipped mussels closure), Mount Maunganui (Green-lipped mussels closure), and Kaipara Harbour (Scallops closure). MFish considers those closures to shellfish harvesting no effect on the options proposed for TAR 1. No restrictions have been placed on fishing in any area within the QMA for recreational interests using the provisions in s 311.

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

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

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

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

97 In the absence of a stock assessment, the catch history and CPUE indices provide the best available information on which to base considerations of opportunities and risks to TAR 1. However, the absence of estimates of biomass and MSY suggest caution when setting the TAC.

98 Two research projects pertaining directly to TAR 1 are scheduled to begin on October 1 2007, and these may provide more information for monitoring the stock in the near future. They are a CPUE analysis to monitor relative abundance (TAR2007/10) and a two-year shed sampling analysis to determine length and age structure of commercial catch (TAR2007/02). These two projects could form the basis for a formal stock assessment in the near future.

99 In the body of the paper, MFish has also endeavoured to set out the relevant uncertainty in, and inadequacy, of that information so that the appropriate caution can be applied in assessing the proposed management options. All options presented in this paper are relatively cautious, which reflects the nature of available information. Section 10 requires caution be exercise when faced with uncertain, unreliable or inadequate information. In the absence of better information, MFish does not consider options for greater increases to the TAC are appropriate in the circumstances.