Review of Sustainability Measures and Other Management Controls for the 2004-05 Fishing Year

Initial Position Paper

3 May 2004

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Section One

Introduction

INTRODUCTION

1 This Initial Position Paper (IPP) provides you with the Ministry of Fisheries' (MFish) initial position on those sustainability measures and other management controls that MFish has confirmed for review under the Adaptive Management Programme (AMP) for 2004. The document also contains proposals for conversion factors for shark fins.

2 The IPP has been developed for the purpose of consultation as required under the Fisheries Act 1996. MFish emphasises that the views and recommendations outlined in each paper are preliminary and provided as a basis for consultation with stakeholders.

3 The process that is undertaken to develop the initial positions in each paper involves consideration of recent research, analysis of commercial catch data, and any other relevant information. In the case of proposal in this paper this has included analysis of AMP proposals put forward by industry and comments on those proposals by the Fishery Assessment Working Group. Each paper has regard to the legal obligations required under the Fisheries Act.

4 MFish does not intend to use the IPP, and the consideration of proposals contained within it, to debate its generic statutory interpretations. A separate and substantive process was undertaken specifically for this purpose.

Outline of the IPP

5 Section one outlines the statutory and policy frameworks under which the IPP has developed.

6 Section two contains the fishstocks that have been reviewed and analysis to support the initial positions proposed.

7 Section three deals with the conversion factors for shark fins.

8 Sector groups have until 11 June 2004 to provide to MFish written submissions on proposals. If you wish to make a submission on the proposals can you please provide your submission to: Kristin Philbert, Ministry of Fisheries, P O Box 1020, Wellington, or email PhilberK@fish.govt.nz.

9 Please note that all submissions are subject to the Official Information Act and can be released, if requested, under the Act. If you have specific reasons for wanting to have your submission withheld, please set out your reasons in the submission. MFish will consider those reasons when making any assessment for release of submissions if requested under the Official Information Act.

10 In July 2004, MFish will complete the Final Advice Paper. This document summarises MFish and stakeholder views on those issues being reviewed and provides final advice and recommendations for each issue. The Minister's letter setting out his final decisions will be sent to all nationally represented stakeholder

groups, and all other stakeholders who expressed an interest in being consulted on particular proposals, as soon as it becomes available.

STATUTORY OBLIGATIONS AND POLICY GUIDELINES

Purpose of the Fisheries Act 1996

1 The purpose statement of the 1996 Act describes its overriding objective of providing for the utilisation of fisheries resources while ensuring sustainability. The 1996 Act defines "ensuring sustainability" as to "maintain the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment". Management of a specific stock must be consistent with these dual requirements in order that sustainability of the stock can be ensured.

2 "Utilisation" of fisheries resources is defined as "conserving, using, enhancing, and developing fisheries resources to enable people to provide for their social, economic, and cultural wellbeing." Within the parameters of these sustainability standards, there is a positive obligation to provide for the use of fisheries resources.

3 The extent of management measures required to achieve the purpose of the 1996 Act will produce a continuum of potential outcomes. Utilisation may be provided for at different levels, and the extent of such use should be considered on a case-by-case basis. Where there is a significant threat to the sustainability of a fishstock, the measures adopted to achieve sustainability are likely to be more stringent than where there is a lesser threat.

4 Consideration of social, economic, and cultural wellbeing (in conjunction with other considerations consistent with the purpose and principles of the 1996 Act) may influence how measures to ensure sustainability are implemented. Hence, providing for utilisation while ensuring sustainability may be achieved in different ways, and the objective may be reached over time. Consideration of the purpose of utilisation may be relevant in determining which is the most appropriate approach.

Setting a Total Allowable Catch

5 Below the level of the purpose statement, the 1996 Act contains a number of specific provisions relating to ensuring a stock is managed sustainably. A key measure is the setting of a TAC for a QMS stock. The Minister is required to set a TAC for each QMS stock. The 1996 Act contains a number of different options in terms of the intended target level able to be implemented for a QMS stock. All of the options are consistent with the purpose of "ensuring sustainability," but each option provides for a fundamentally different management outcome.

Maximum Sustainable Yield (s 13)

6 Section 13 represents the default management option that is to be applied when setting a TAC for a stock within the QMS, unless that stock qualifies under criteria for management under ss 14 or 14A.

7 Under s 13 there is a requirement to maintain the biomass of a fishstock at a target stock level, being at, or above, a level that can produce the MSY, having regard to the interdependence of stocks. 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 fishstock threshold level.

8 If a stock is currently below the target stock level, there is a requirement pursuant to s 13(2)(b) to set a TAC that will result in the stock being restored to the target stock level (ie, at or above a biomass that will support MSY) and in a way and rate which has regard to the interdependence of stocks and within a period appropriate to the stock, and having regard to the stock's biological characteristics and any environmental conditions affecting the stock. If the stock is above a target stock level, there is a requirement to set a TAC that will result in the stock moving towards the target stock level, or alternatively remain above the target stock level, having regard to the interdependence of stocks (s 13(2)(c)). In determining the way in which, and rate at which, a stock is altered to achieve the target stock level, the Minister is to have regard to such social, cultural, and economic factors as he or she considers relevant (s 13(3)). Section 13(3) makes it explicit that such factors are relevant in the determination of the way and rate of progress to the target level, rather than in the determination of the target stock level itself.

9 There is no set rate, or time frame, within which a rebuild or a "fishing down" of a stock must be achieved. However, the progress of moving towards the target stock level must be suitable to the fishery in question, having also considered those matters specified in s 13 of the 1996 Act. Hence, a TAC should be viewed as a tool for moving a stock towards the target stock level. Other measures may be adopted in conjunction with a change in the TAC. However any additional measures should not be relied on in place of the TAC.

10 Additional flexibility is encompassed within s 13 by the capacity to provide for an in-season adjustment to the TAC for certain stocks. Any TAC that is set or varied has effect on and from the first day of the next fishing year for the stock concerned. An exception applies to those stocks listed on the Second Schedule to the 1996 Act. This Schedule can apply to any stock with a highly variable abundance. For such stocks in years of high abundance, the TAC may be increased in-season, and the Minister may allocate all or part of that increase as Annual Catch Entitlements (ACE) to commercial fishers. At the commencement of the next fishing year the TAC reverts to the level set at the commencement of the previous fishing year. This means that commercial catch levels, not property rights in the form of individual transferable quota, are increased during the fishing year.

11 An in-season TAC increase may be distributed between commercial, customary and recreational fishers, and an allowance made for other sources of mortality to the stock. The increase allocated to commercial fishers does not result in an increase to the TACC during the fishing year.

12 The fundamental objective of an in-season adjustment is to manage a stock at or above the level that can produce the MSY. Information about what is the desirable

level of the TAC that can produce the MSY is available at such a time that a decision is made after the start of the fishing year. However, at the end of the fishing year, the TAC reverts to the level that was applicable at the start of the fishing year.

No Specified Target Stock Level (s 14)

13 Section 14 of the 1996 Act prescribes an exception to the target stock level based on an assessment of the MSY for those stocks where:

a) it is not possible to estimate MSY because of the biological characteristics of the species; or

b) a catch limit for New Zealand has been determined as part of an international agreement; or

c) the stock is managed on a rotational or enhanced basis.

14 For stocks that meet the above criteria, and as a result are listed on the Third Schedule of the 1996 Act, a TAC may be set other than in accordance with the requirements in respect of target stock levels stated in s 13, provided the TAC better achieves the purpose of the 1996 Act.

15 While any TAC must be set in a way that ensures use of the stock is sustainable, there is no requirement to take into account or be guided by the need to manage in accordance with MSY. In contrast to s 13, s 14 provides significant flexibility as to the target stock level set for a stock. The rationale for that flexibility is different for each of the categories of stocks eligible for listing on the Third Schedule.

16 The biological characteristics of some stocks mean that it is not possible or necessary to estimate the MSY to ensure the sustainability of the stock. For example, squid is a short-lived species. There is currently no ability to estimate the available abundance either before or within the fishing season. The extent of catch taken from the available biomass will not affect future recruitment or abundance of the species. For this reason, the TACs set for squid stocks have not been significantly changed during the last decade, but the actual catch levels have fluctuated markedly within that time.

17 Under an international agreement, a catch limit for a species may be set and allocated between individual fishing nations, eg, southern bluefin tuna. Typically such international agreements relate to highly migratory species or species that straddle national boundaries. The overall catch limit set for the species must be consistent with international fisheries management law; hence, the catch limit would need to ensure the sustainability of the species. There is no requirement that New Zealand separately manages that portion of the species it is allocated at MSY.

18 The third category relates to those stocks managed on a rotational or enhanced basis. The effect of rotational fishing or fisheries enhancement is that MSY may no longer be the appropriate target level (eg, scallops in area 7 (SCA 7)). Enhancement is designed to increase the level of abundance. While enhancement of the stock may not need to be consistently maintained, the ability to intervene to increase abundance means that the sustainability of the stock can be ensured. The available yield will change over time.

19 Rotational harvesting involves selective harvesting of a portion of the stock. Rotational harvesting is best suited to sedentary species or stocks with established fishing grounds. The yield taken in any one year may not be the MSY available for the stock overall. The ability to successfully manage a stock on a rotational basis may be dependent upon the biological characteristics of the stock.

20 A combination of rotational harvesting and enhancement may result in greater flexibility in setting a TAC that will ensure the sustainability of the stock. Enhancement may enable rotationally harvested areas to be restocked at a level above that which could be naturally produced. Enhancement may also provide an ability to maximise catch from each area as it is rotationally fished. Areas closed to fishing allow both enhanced and wild stocks to contribute to the spawning biomass and reach harvestable size before being subjected to commercial fishing. Area closures may protect sufficient adult stocks to ensure adequate recruitment to the fishery.

21 As with s 13, s 14 provides for an in-season increase to the TAC for stocks listed on the Third Schedule. The purpose of an in-season increase under s 14 is to take advantage of the available yield beyond any pre-determined target stock level. However, the level of the in-season increase must be consistent with the objective of ensuring sustainability of the stock.

22 An in-season TAC increase may be distributed between commercial, customary and recreational fishers, and an allowance made for other sources of mortality to the stock. Additional ACE is generated during the fishing year in respect of the increase in the TAC allocated to commercial fishers. At the close of the fishing year the TAC reverts to the level set at the beginning of that fishing year.

Above Level of Long Term Viability (s 14B)

23 A further exception to setting a TAC in accordance with the MSY is the management of a stock under s 14B of the 1996 Act. A TAC is to be set at a level that ensures the stock is maintained above the level that ensures its long-term viability. However, the Minister must be satisfied that the purpose of the 1996 Act would be better achieved by setting a TAC other than in accordance with s 13 (ie, at or above MSY). Maintaining a stock above the level that ensures its long-term viability is consistent with the purpose of the 1996 Act in relation to meeting the reasonably foreseeable needs of future generations.

24 The purpose of s 14B is to enable other related stocks to be fully harvested. The stock in question must be taken primarily as an incidental catch during the taking of one or more other stocks and must constitute only a small proportion of the combined catch taken. The 1996 Act does not prescribe a level that is deemed to be above that which ensures the long-term viability of a stock. That determination is required on a case-by-case basis, subject to the requirement that the TAC must be set at a level no greater than what is required to allow for the taking of another stock in accordance with its own TAC and TACC. Quota owners are required to take all reasonable steps to minimise the catch of the stock managed below the biomass that will support the MSY (B_{MSY}).

25 Section 14B addresses the difficulty of managing stocks within a mixed fishery to B_{MSY} without forgoing some economic return. In some mixed species fisheries the

TACs of minor bycatch species limit the ability of fishers to catch their entitlement of the target species and could result in closure of the target fisheries.

26 Section 14A specifies a number of significant tests apply in order to mitigate the risk of managing a stock below B_{MSY}. First, the stock must be able to be maintained above a level that ensures its long-term viability. Secondly, the Minister is required to consider the need to: (1) commission appropriate research to assess the impact of reducing the stock below B_{MSY}; (2) implement measures to improve the quality of information about the stock; (3) close areas to commercial fishing to reduce any sustainability risk to the stock; and (4) avoid any significant adverse effects on the aquatic environment of which the stock is a component. Hence, the setting of a TAC under s 14B to allow for the taking of another stock may need to be balanced by the closure of areas to fishing to ensure the stock is maintained above a level that ensures its long-term viability. Consideration of significant adverse effects of fishing could have potential implications for the aquatic ecosystem as a result of reducing the biomass of the stock.

27 Consideration also needs to be given to the social, cultural and economic implications of managing a stock below B_{MSY}. The setting of a TAC above the level that ensures the stock's long-term variability must have the support of quota owners who hold 95% of the shares in the stock. Arrangements need to be in place to address the concerns of those quota owners who do not support the setting of a TAC under s 14B. The total benefits of managing the stock at a level other than that permitted under s 13 must outweigh the total costs. Managing the stock in a manner other than s 13 must have no detrimental effects on non-commercial fishing interests in the stock.

28 A final important check and balance when setting a TAC under s 14B is that the Minister for the Environment is required to concur with a proposal to enable a TAC to be set for a stock above the level that ensures it long-term viability.

29 The ability to set a TAC under s 14B is triggered by the submission of a proposal from quota owners to the Minister of Fisheries to manage the stock in this way. An Order in Council (ie, a regulation) must be made specifying the application of s 14B for the named stock. No proposal relating to s 14B has been received in respect of the stocks to be introduced to the QMS on 1 October 2004.

Other Statutory Obligations Applicable When Setting a TAC

30 When setting a TAC, a number of generic provisions of the 1996 Act need to be taken into account – in particular, the purpose of the Act (s 8), the environmental and information principles (outlined in ss 9 and 10 respectively), factors to be taken into account when setting sustainability measures (s 11), and the application of international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5).

Information Principles

31 The nature of the data and assumptions used to generate fisheries assessments and the results produced contain inherent variation and uncertainty. The 1996 Act specifies, in s 10, the information principles to use when information is uncertain. Decisions should be based on the best available information that, in the particular circumstances,

is available without incurring unreasonable cost, effort, or time. Decision makers should consider any uncertainty in the information available and be cautious when information is uncertain, unreliable, or inadequate. However, the absence of, or any uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the 1996 Act.

Environmental Principles

32 The 1996 Act prescribes three environmental principles that the Minister must take into account when exercising powers in relation to utilising fisheries resources and ensuring sustainability. First, associated or dependent species (including non-fish bycatch) should be maintained above a level that ensures their long-term viability. Secondly, biological diversity of the aquatic environment should be maintained (ie, the variability of living organisms, including diversity within species, between species, and of ecosystems). Lastly, habitat of particular significance for fisheries management should be protected.

33 The 1996 Act defines associated and dependent species as any non-harvested species taken or otherwise affected by the taking of a harvested species. The term "long-term viability" is defined in the 1996 Act as a low risk of collapse of the stock or species, and the stock or species has the potential to recover to a higher biomass level. Long-term viability may be considered in the context of the natural dynamics of populations. At one level the concept implies the need to ensure the continuing existence of species in the sense of maintaining populations in a condition that ensures a particular level of reproductive success. At another level, long-term viability implies an ability to maintain populations at a level that ensures the maintenance of biodiversity. Long-term viability could be achieved at very low levels of population size, depending on associated risks, such as recruitment failure at low population sizes. Long-term viability also needs to be considered with respect to utilisation by different sector groups. Equally, where fishing is affecting the viability of associated and dependent species, there is an obligation to take appropriate measures, such as method restrictions, area closures, and potentially adjustments to the TAC.

34 "Biological diversity" includes the variability among living organisms, including diversity within species, between species, and of ecosystems. The aquatic environment is of broad scope and encompasses:

a) the natural and biological resource comprising any aquatic ecosystem; and

b) all aquatic life and all places where aquatic life exists.

35 The maintenance of biodiversity needs to be considered in the context of the purpose of the 1996 Act that assumes that, where possible, a resource should be used to the extent that sustainability is not compromised. Determination of the extent of fishing or the impacts of fishing that can occur requires an assessment of the risk that fishing might cause a species to become extinct or biodiversity is reduced to an unacceptable level. In the absence of information to undertake a detailed assessment, the information principles specified in the 1996 Act provide guidance for decision makers on the approach to be adopted.

36 Habitat can be defined as "the place or type of area in which an organism naturally occurs" (NZ Biodiversity Strategy). The Magnuson-Stevens Fishery Conservation

and Management Act (USA) defines "essential fish habitat" as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity". The maintenance of healthy fishstocks requires the mitigation of threats to fish habitat. However, the source of the threats may not be confined solely to the activity of fishing. A range of terrestrial activities may impact on fisheries habitats. Habitats that assist in the reproductive and productive process of a fishery, hence are of special significance, should be protected. Adverse effects on such areas are to be avoided, remedied, or mitigated.

International Obligations (s 5(a))

37 There is a range of international obligations that relate to fishing. The two key pieces of international law relating to fishing, and to which New Zealand is a party, are the United Nations Convention on the Law of the Sea, 1982 (UNCLOS) and the United Nations Convention on Biological Diversity 1992 (the Biodiversity Convention). It is MFish's view that the provisions of the 1996 Act, and the proposed exercise of powers under the legislation are consistent with New Zealand's international obligations.

38 The 1996 Act is to be interpreted, and all persons exercising or performing functions, duties, or powers under the Act are required to act, in a manner consistent with New Zealand's international obligations relating to fishing. As a general principle, where there is a choice in the interpretation of the 1996 Act or the exercise of discretion, the decision maker must choose the option that is consistent with New Zealand's international obligations relating to fishing (s 5(a) of the Act).

39 MFish is involved in a number of initiatives relating to the management of stocks within New Zealand fisheries waters that are consistent with its international obligations. MFish seeks to give effect to those obligations on a generic basis. Application of generic policies, such as the Marine Protected Area Strategy and MFish's Environmental Management Strategy, to the management of specific stocks will follow in due course.

Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5(b))

40 The 1996 Act is to be interpreted, and all persons exercising or performing functions, duties, or powers under the Act, are required to act in a manner consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5(b)). This requirement is intended to further the agreements expressed in the Deed of Settlement referred to in the Preamble to the Settlement Act. In particular, Mäori non-commercial fishing rights continue to give rise to Treaty obligations on the Crown.

41 The species-specific sections in this document set out information relating to the customary interest in the species concerned. An allowance for customary fishing has been made for each stock on the basis of a qualitative assessment of that interest. The consultation process will provide Mäori with an opportunity to comment on the customary use and management of the stocks. However, no explicit consideration has been given to the application of the specific customary management tools available under the 1996 Act to the stocks concerned. Introduction of the species into the QMS will not preclude adoption of appropriate management measures in the future to provide for customary use and management practices.

42 In accordance with the Settlement legislation, the Treaty of Waitangi Fisheries Commission will be allocated 20% of all quota shares in the TACC set for the stocks upon introduction into the QMS.

Additional Factors to be taken into Account (s 11)

43 Before setting or varying any sustainability measure (including a TAC) the following factors must be considered:

a) Any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991 and any management strategy or management plan under the Conservation Act 1987 that apply to the coastal marine area and which the Minister considers to be relevant;

b) Any effects of fishing on the stock and the aquatic environment;

c) Any existing controls that apply to the stock or area concerned;

d) The natural variability of the stock concerned;

e) Any conservation services or fisheries services;

f) Any relevant fisheries plan approved under this Part; and

g) Any decisions not to require conservation services or fisheries services.

44 Where any of the above factors are relevant, they are discussed in the species-specific sections. MFish is not aware of any specific plans, statements or strategies that are relevant to the stocks in this document. No fisheries plans have been approved to date. MFish is not aware of any plans being contemplated at this time for any of the stocks being introduced into the QMS this year. No explicit decisions have been made not to require services in a fishery on the basis of any undertaking by stakeholders either within or outside a fisheries plan to undertake certain services directly.

45 Consideration also needs to be given to the most effective way of achieving the desired outcome of a sustainability measure. An important factor in supporting the use of non-statutory measures is the degree of support for the measure and the nature of the monitoring and enforcement regime proposed to support the measure. However, the process of introducing stocks to the QMS is unlikely to involve implementation of measures on a non-regulatory basis. The actual commercial participants in the fishery may be largely unknown until such time as quota is allocated.

Allocation of TAC

46 The Minister is required to make allowances for different fishing interests under the Act. The Minister must have regard to the TAC and allow for:

a) customary Mäori;

b) recreational fishers;

c) all other sources of mortality to the stock caused by fishing; and

d) the TACC

47 In the absence of other information TACs may be set at levels based on consideration of known or estimated levels of recreational, Mäori customary, and commercial catch and all other sources of fishing related mortality. The information about the catch of each sector group informs the subsequent allocation of the TAC but that, in itself, will not be determinative of that exercise. The Minister makes a separate decision about allocation after setting the TAC.

Factors Determining Allocation

48 The Fisheries Act does not expressly state the manner in which, or the factors to be taken into account, when the Minister allows for non-commercial interests in a fishery and apportions the TAC between stakeholders. The allocation of the TAC is a matter for the Minister's assessment taking into account all relevant considerations.

49 No explicit statutory mechanism provides guidance as to the apportionment of the TAC between sector groups either in terms of a quantitative measure or prioritisation of allocation. MFish considers that a number of provisions in the Fisheries Act provide some guidance on allocation of the TAC between the respective interests to be allowed for.

50 In terms of those considerations to be taken into account, MFish notes that s 8 of the Fisheries Act 1996, in the context of utilisation of fisheries resources, refers explicitly to the Act enabling people to provide for their social, economic, and cultural well-being. Further, s 13(3) states that regard is to be had to such social, economic, and cultural factors as the Minister's considers relevant when considering the way and rate at which a stock is moved towards, or above, a level that can produce the MSY. It is implicit that in considering such factors when setting or varying a TAC in accordance with s 13(3), such factors are also integral to the decision of apportioning allocation of a stock between stakeholders.

51 MFish considers that those factors which may be relevant to the exercise of the Minister's discretion, in addition to the principles specified in s 5 (international law and Settlement Act obligations), s 8 (purpose statement), s 9 (environmental principles), and s 10 (information principles) of the Act, include:

a) current status of stock;

b) existing allocations;

c) current catch levels;

d) previous decisions;

e) equity of allocation - notion of "shared pain" when stock declines / "shared benefit" when stock rebuilds;

f) participation levels and importance of the resource, including customary values;

g) population trends;

h) assessment of relative value of resource to respective sectors;

i) current and past fishing practices (including overfishing, voluntary shelving or closures by a stakeholder);

j) investment and initiatives undertaken to develop or enhance the resource;

k) impact on ability of sector to take allocation provided ;

l) economic impact of allocative decisions; and

m) social and cultural impact of decisions.

52 Information about the current status of the stock relative to the statutory target level, existing catch levels, existing allowances and catch levels, plus previous decisions may be informative of the actions that need to be taken.

53 The customary fishing regulations do not provide for the Crown to place limitations on customary fishing, apart from ensuring the sustainability of a particular stock. Customary take is regulated through the authorisation system in the customary regulations which require that all customary fishing is to be undertaken in accordance with tikanga and the overall sustainability of the fishery. In determining the extent of customary take, the Minister is required to provide for the input and participation of tangata whenua and are to have particular regard to kaitiakitanga (s 12(1)(b)).

54 Where the TACC, or in the absence of a TAC/TACC then current commercial catch, is reduced for sustainability/conservation purposes there is a direct relationship between managing recreational catch and reducing current catch, and vice versa. From a purely legal perspective there is no obligation to undertake a proportional reduction between recreational and commercial interests where the TAC (or the current catch level) or an individual stakeholder allocation is reduced for conservation/sustainability purposes. Both law and common sense dictate that where commercial catch is reduced for conservation reasons, reasonable steps should be taken to avoid the reduction being rendered futile through increased recreational fishing.

55 However, subject to this consideration, there is no legal requirement that a decrease or increase in the allocation of the recreational allocation is to result in a corresponding proportional adjustment of commercial catch, and vice versa. MFish notes that the Fisheries Act assigns no priority between commercial and recreational interests. The Act is directed at both commercial and non-commercial fishing. Within that duality the Act permits the preference of one sector to the disadvantage of another; for example to provide for greater allowance for recreational interests in proportion to the commercial allocation. Any reallocation of catch from the commercial fishers to non-commercial may be subject to claims for compensation to commercial fishers under s 308 of the Act, except at the time of introduction.

56 Notwithstanding the Minister's discretion to allocate catch, case law also considers that it is not unreasonable for commercial and recreational fishers to share some of the "pain" from a reduction in the TAC. There is no requirement that the interests of recreational or commercial fishers must be fully provided for. MFish considers in situations where there is an absence of information about the relative benefits (i.e. utility) to be derived from allocating a stock to one or other sector then it is equitable for both commercial and recreational fishers to ensure the sustainability of the stock through a reduction in the TACC and recreational allowance (along with the implementation of commensurate measures to effect a reduction in catch - such as bag limit reductions). (The issue of utility is discussed in more detail in the following

section.) Equally, commercial and recreational fishers should derive shared benefit from the rebuild of a fishery in terms of the allocation provided to the respective sectors, all other things being equal.

57 Consideration should also be given to the ability of a sector to take the allocation provided. Impediments may exist that preclude the sector from exercising the full extent of its entitlement. Tools are available in the Act that enhance the ability of different sectors to exercise their right to fish. As well as implementing specific measures in support of allocative decisions, caution should be taken to ensure that a decision does result in a sector being precluded from being able to take the allowance allocated.

58 Logically those parties who are responsible for the enhancement of a resource should receive the benefit of the activity. However, the ability to ascertain the increased yield from a fishery as a result of enhancement activities and hence the extent of the allocation provided to the sector is problematic. The development of a fishery resource involves demonstrating through research and/or monitoring that an increase of catch from existing and new fisheries is sustainable. It is generally assumed that the development will occur as a result of a structured deliberate initiative. Arguably any one sector could seek to develop a fishery. It is arguable that the sector that undertakes the development of a fishery should be entitled to be allocated the benefits of that development.

59 Population trends are reflected in the level of recreational fishing undertaken, both on a national and regional scale. The growth of urban centres, in particular Auckland, has a significant impact on particular fisheries. An allowance for the recreational interest and the corresponding management controls for a stock could take into account existing population distribution and growth. Hence where a greater recreational demand arises the Minister is not precluded by any proportional rule from providing an increased allowance to the recreational entitlement subject to weighing all competing demands on the TAC (see *New Zealand Fishing Industry Association (Inc) and Ors v Minister of Fisheries and Ors* (CA82/97, 22/7/97) page 18).

60 Certain fisheries are considered to be of particular importance to certain fishers. In considering the extent of the recreational and Mäori customary allowance it is appropriate to consider the nature of the species and the importance of the species to fishers. The value attributed to a resource is not limited solely to economic value but may also include the aesthetic value and non-market value. For example, while snapper is a medium to high value commercial fish species, it is also an important recreational target species. Certain species may be valuable to particular sector groups, for example, charter boats, and may have significance for tourism by contributing to New Zealand's popularity as a tourist destination. The abundance of a species and the availability of particular size fish for a specific stakeholder group may be factors relevant to the Minister's decision.

61 Stakeholders may elect to exercise their fishing rights in a manner, which results in their allocation in a fishery being undercaught. Voluntary closures and shelving of allocation may be undertaken as a means of improving the abundance of a species and the availability of certain sized fish. Such methods may improve recruitment. In the absence of explicit shares in a fishery, any subsequent increase in the TAC as a result of such methods would be available to all stakeholders. Stakeholders are not immune

from any subsequent decrease in the TAC for sustainability purposes simply on the basis of the previous undercatch of their allowance.

62 The Act does explicitly recognise underfishing rights of commercial fishers. Where the person holding annual catch entitlement for a stock (not the owner of the ITQ) undercatches the extent of their entitlement, the person may carry forward the extent of the undercatch to the second fishing year up to a maximum of 10% of the total Annual Catch Entitlement (ACE) they held in the first fishing year. The carry forward of underfishing rights does not apply when the TACC is reduced in the second fishing year (s 67A(2)(b)).

63 Setting of the TAC and the manner in which the TAC is allocated may have significant social, cultural, and economic implications for stakeholders and consequential downstream economic activity. In *New Zealand Fishing Industry Association (Inc) and Ors v Minister of Fisheries and Ors* (CA82/97, 22/7/97) it was held that there was a clear obligation to move a stock towards B_{MSY} and when deciding upon the time frame and the ways to achieve that statutory objective the Minister is to consider all relevant social, cultural and economic factors.

64 The Court of Appeal suggested that a careful cost-benefit analysis needs to be undertaken to support a particular decision to reduce the TACC and in respect of a reasonable range of options available to the Minister in moving a fishery toward B_{MSY}. Where a decision with major economic impact is considered necessary the rationale for that decision should be clearly transparent. Those affected ought to be able to establish that all other reasonable possibilities were analysed and that the decision adopted was the preferable option. The general principles noted by the Court of Appeal appear equally applicable to allocative decisions on introduction of a stock into the QMS.

65 The economic factors referred to in s 13(3) need not be confined to matters directly affecting the fishing industry. Wider considerations affecting the national economic interest are capable of being regarded as relevant. MSY can be interpreted as being directed at the national interests as well as sectional interests (see *New Zealand Fishing Industry Association (Inc) and Ors v Minister of Fisheries and Ors* (CA82/97, 22/7/97) p 15).

66 In setting and reducing a TACC consideration is required of the economic impact of any such action on individual quota owners, those fishers dependent on obtaining annual catch entitlement and on the QMS generally. However, the reduction of the current commercial catch or a TACC is not rendered unlawful simply on the basis that the decision adversely impacts the property right inherent in the QMS. In the context of fisheries legislation, a property right constitutes a right to harvest, which is subject to the exercise of the Crown's statutory powers. Accordingly, MFish considers that financial security of a property right is a valid but not irrefutable consideration in the context of the Minster's TAC/allocative decisions.

67 The actual financial costs associated with allocative decisions are to be assessed according to the nature of the fishery. A decline in the commercial allocation may impact on quota and lease price, thus impacting on potential new entrants and existing quota holders and owners. The setting of a TAC, and allocative decisions in a general

context, impact on economic investment in terms of upgrading of plant and fleet structure.

68 Downstream impacts may result as a consequence of allocative decisions made in respect of both recreational and commercial stakeholders. In addition to the commercial harvesting and processing sector a significant number of service industries are linked to fishing, including charter operators, sale of fishing gear, repair, and transport related services. Decisions may also impact on particular communities where the fishing and fishing related services provide a significant contribution to a local economy.

69 The impact on individual fishers may be difficult to assess and will be dependent on a range of factors, including the extent of any reduction in catch; the level of debt; the species mix of quota held; and the ability of individual fishers to adapt.

70 It is not entirely clear as to the nature and extent of any cost benefit analysis required to be undertaken in any given situation. A cost benefit analysis may be in the form of an analysis of the economic impact to stakeholders and fishing related sectors of the economy. Equally it could include the factoring of environmental and social costs and benefits. The Court of Appeal stated that when considering <u>any</u> reduction in the TACC the economic impact of that action must be carefully weighed. Later in the same judgment the Court referred to a cost-benefit analysis in the context of implementing a decision of major economic impact.

71 A cost benefit analysis is designed to act as a tool for deriving the most efficient and productive solution. In itself such an analysis is not intended to impose a barrier to implementing measures considered necessary for fisheries management purposes. In many instances MFish is not in possession of the information necessary for a detailed cost benefit analysis to be undertaken. Invariably it is the stakeholders concerned who hold the relevant information. MFish has requested that stakeholders provide relevant information in the course of their submissions on management proposals. MFish considers that in all instances it is impractical and unnecessarily burdensome for the Crown to undertake an exercise for all fisheries. MFish considers that a balance ought to be adopted between the magnitude of the impact of the proposed decision, the information currently available and information readily obtainable, and the requirement to provide an analysis of the economic implications of the proposed solution.

72 Social impacts may include the affect of decisions on individuals and communities. There is no restriction on the nature of the social factors that may be taken into account. There is no explicit relationship in the Act between those classes of persons having an interest in a stock or the effects of fishing on the aquatic environment and the factors, which the Minister may consider pursuant to s 13(3). The latter may be considered to be significantly wider in scope than the former. Non-extractive uses, social values and expectations, and political imperatives may therefore all constitute relevant considerations in the course of the Minister's decisions as to the setting of TACs and allocation of the TAC between fishing interests.

73 Reference to cultural factors in s 13(3) can be interpreted as encompassing both those provisions of the Act relating to the interests of Mäori and tangata whenua but also

cultural practices and values. The precise nature of those practices and values are to be determined by tangata whenua.

Allocation Models

74 The various factors identified above essentially fall within one or other of two key approaches that can be adopted for purposes of allocating the TAC - a claims based allocation and an utility based allocation. For example factors relating to a claims based allocation include existing allocations, current catch levels, equity of allocation, participation levels, and importance of the resource to one or more sectors. Factors relating to a utility based allocation, include population trends, assessment of relative value to respective sectors, investment and level of development or enhancement, ability of sector to take allocation provided, and the social, cultural and economic impact of allocative decisions. An explanation and application of the two approaches are outlined below.

Claims based allocation

75 The term *"Claims based allocations"* describes a situation where allocations are made on the basis of a consideration of the legitimacy of claims to the resource. Generally these claims are based on some form of present or historical association with the resource, giving rise to expectations on the part of fishers (or classes of fishers) with respect to on-going future involvement. The claims based approach does not generally focus on future management opportunities or best value that could be derived from the fishery.

Utility based allocation

76 The term *"Utility based allocation"* describes a situation where allocations are based on the utility (or quantum of well-being) that would flow from a particular allocation. This method tends to favour allocations to those who value the resource most (downplaying the importance of past associations with the resource). As such it tends to have a focus on the future rather than the past. Within New Zealand fisheries management, the most obvious example of the utility based allocation approach is the on-going trading of Individual Transferable Quota that occurs under the QMS.

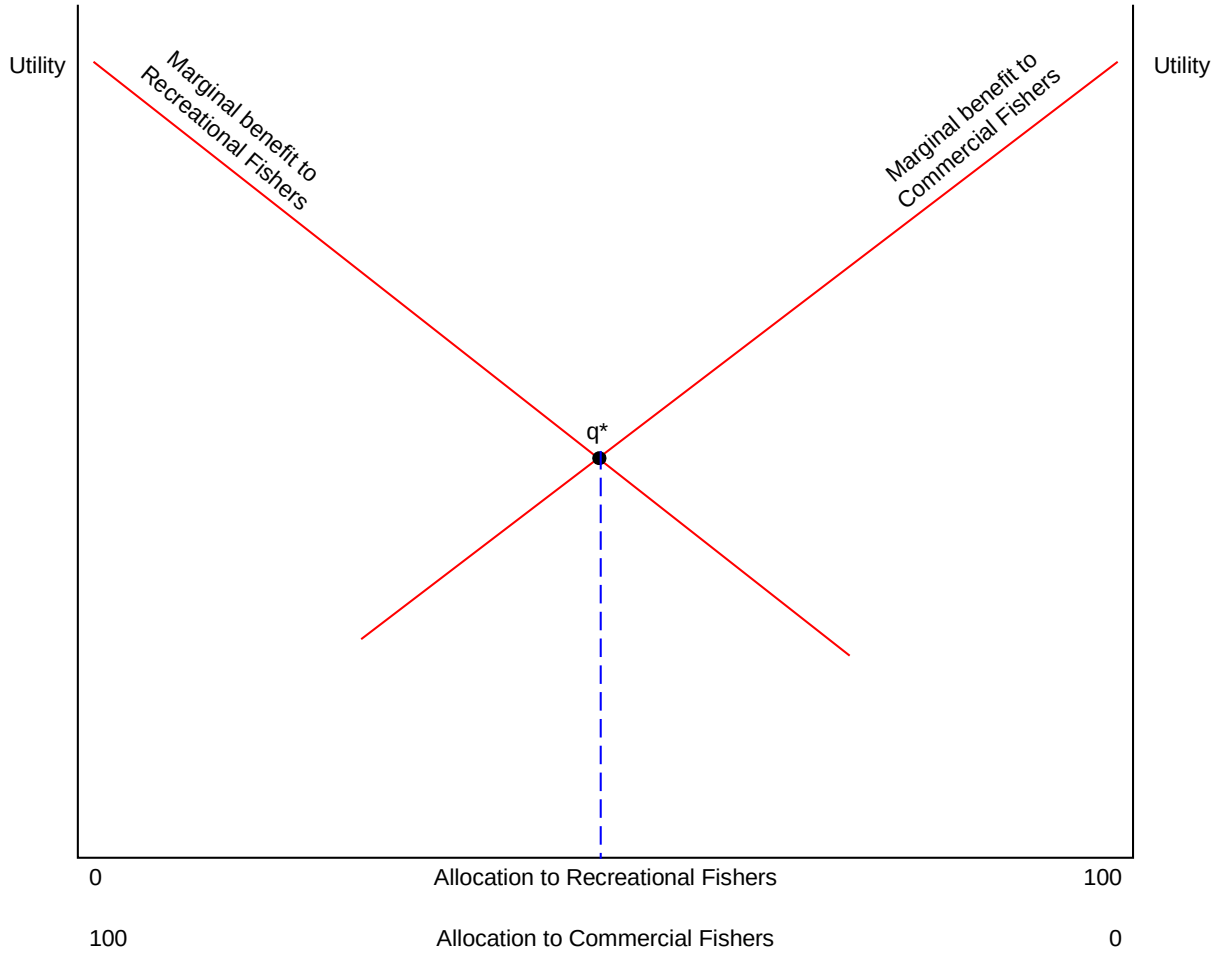
77 Under the utility based approach it is possible to conceptualise the allocation problem as one of determining the point at which it is not possible to reallocate the resource (amongst recreational and commercial fishers) without reducing the total quantum of utility that would flow from the resource. The concept is illustrated in Figure 1 below with respect to allocations between the commercial and recreational sectors. Assuming a (typical) downward sloping demand curve for both recreational and commercial fishers, the optimal point of allocation is given by q*. For any point to the left of q*, there is benefit in allocating more of the resource to recreational users (as the benefit to recreational fishers of an extra quantum of catch is greater than the benefit to commercial fishers foregone). Similarly, for any point to the right of q*, there is greater benefit in allocating more to commercial fishers.

78 Undertaking this kind of utility comparison is in practice difficult. In particular, comparing the two marginal benefit curves is made problematic by both an absence of

information and the lack of a readily available basis for making value comparisons between recreational and commercial fishers.

79 Determining an estimate of marginal benefit to commercial fishers tends to be the most straightforward part of the task. If the fishery is in the Quota Management System, quota values provide a readily available proxy valuation of a kilogram of fish to the commercial sector. If the fishery is not in the QMS, estimates of value can be made by, for example, considering quota value of like fisheries already in the QMS.

Figure 1: Determining the allocation between commercial and recreational fishers



80 However, determining an estimate of the value of a fishery to recreational fishers is, in contrast, much more difficult. There are no readily available indicators of value, at least not of a form that would allow a comparison between recreational and commercial fishers. (Note while indicators such as the number of recreational fishers or their expenditure on recreational fishing may provide some preliminary insights in this area, they do not provide a suitable basis for value comparison.)

81 In response to this problem, non-market valuation techniques are sometimes brought to bear. Non-market valuation techniques use surveys or observations of behaviour coupled with sophisticated analytical methods to develop estimates of value sufficient to provide a basis for comparison with the value estimates available for the commercial fisheries. Analytical techniques of this type, however, and the results

they generate need to be treated with a degree of caution. For example, survey respondents may seek to bias the results so as to produce outcomes in their favour (e.g. the allocation of a greater share of a fishery to recreational users).

82 Note, the figure above reflects a *static* approach to the allocation problem in the sense that it provides an estimate of optimal allocation at a single point in time. However, in reality the optimal allocation point will change over time in response to changing social, cultural and economic factors. A *dynamic* allocation framework would automatically respond to those changing factors with continual reallocations - in the same way as quota and ACE are continually reallocated amongst commercial fishers via quota and ACE trades. A feature of an efficient dynamic allocation system (such as the on-going reallocation of quota) is the absence of any decision maker intervening to make allocation decisions on behalf of individuals. Changes in allocation reflect choices made by individuals, who are able to make independent decisions about use of the resource with a greater sense of certainty.

83 In order for a dynamic allocation system to operate effectively a single tradable right is essential. All participants would have the same type of right and make their own decisions about their involvement in a fishery (reflecting the utility consequences of the options available to them). However, there is no single right that is common across all sectors involved in NZ fisheries. As a consequence, the Government, by default, makes the decision for all sectors. In the future there is the potential that fisheries plans can provide a framework within which stakeholders can make their own collective decisions about allocation of a resource.

84 Currently there is an absence of a suitable dynamic allocation framework and only limited information on utility is available to decision makers to assist with allocation matters. At best, techniques such as the non-market valuation methods mentioned above can only suggest whether reallocation might be considered on utility grounds by indicating a utility benefit from reallocation away from the status quo. However, there may be no assessment of the extent of the re-allocation required to achieve the optimal allocation point. Furthermore, the insights provided by the non-market valuation work can become outdated in the period between the survey work being undertaken and the time at which the allocation decision is to be made. The potential for information to become outdated is not unique to non-market valuation surveys. The same can be said for stock assessments.

85 The decision maker (Government) is required to make an estimate of the optimal allocation point based on imperfect information. In this situation, allocations by Government will inevitably be sub-optimal and result in dissatisfaction from (at least some) stakeholders. Furthermore, commercial fishers could not plan with any degree of certainty in the face of an ongoing opportunity for Government intervention on allocation decisions. The use of thresholds could be developed in order to assess priority for reassessment and define trigger points or decision rules as to when decision makers should consider reallocation within a fishery. While the use of such thresholds and trigger points may remove some degree of the uncertainty about Government intervention, such a system still does not allow individuals to give effect to their own assessment about the value of the resource.

86 One particular aspect of the utility based allocation model that needs to be taken into account is the impact of any reallocation on Provisional Catch History (PCH). PCH is

generated prior to introduction of a species into the QMS and provides eligible fishers with a contingent right to a share of the TACC, allocated as quota, following introduction.

87 Allocation models tend to stress the importance of the creation and preservation of "property rights" to the resource. Over time, it is the robustness of these property rights that will determine the amount of utility that will flow from the resource. There is utility attached to PCH because it reflects the opportunity of future access and provides some opportunity for investment prior to introduction into the QMS. Theoretically, any fettering of this right undermines any utility value attributed to PCH.

88 In practice, the value commercial fishers ascribe to PCH will depend on the expectations of fishers about the quantum of quota they will receive. This expectation is limited by the framework of the Act that provides for a quantum of quota to be allocated following determination of the TACC. The TACC is determined after consideration of sustainable yield and allocation to other sectors. Submissions from commercial fishers have indicated that they are uncertain about the quantum of quota they will receive and that this uncertainty is in the main derived from uncertainty over sustainable catch. Changes may have occurred in the fishery subsequent to the qualifying years which suggest that fishers have not used PCH as a basis for decision making about participation on the fishery. As a consequence, in a generic sense, MFish would assess the utility of PCH as low given the characteristics of the right (lack of transferability, durability, divisibility, exclusivity). Economic analysis undertaken as part of the consideration of compensation for the prorating down of PCH for Fourth Schedule species on introduction to the QMS is supportive of this view. The analysis suggested that the benefit of quota outweighed the loss of up to 20% of PCH/quota right. However, no analysis was undertaken of the point at which the loss of PCH/quota right would outweigh the benefit derived from quota.

89 There is the potential for reallocation of catch to occur between sector on the setting of allowances when a stock is introduced to the QMS. There is no requirement under the Act for the Crown to compensate for the reallocation of PCH to recreational or customary fishers. This further emphasizes the relatively weak nature of the right associated with PCH and hence the weight that should be assigned it by the Minister when making allocation decisions on introduction of stocks to the QMS. In addition, the nature of PCH is but one factor that can be taken into account in decisions on allocation of the TAC.

Application of allocation models

90 There are circumstances where allocations on the basis of a past association with the resource (ie claims based) may maximise the utility of a resource at the time of allocation. In a theoretical sense where a stock or species is not scarce and largely unfettered access is provided to all sectors prior to introduction, it can be assumed that current catch will be a reasonable approximation of utility (particularly given the uncertainty attached to techniques for estimating value) because all sectors should be in a position to fully satisfy their demand for a stock or species. Therefore reallocation should be considered in fisheries where the proposed TAC will reduce the cumulative total of current catch or where current catch has been significantly influenced by non-market related factors. While noting that the permit moratorium

may be an influencing factor in terms of limiting explicit development opportunities, the inevitable consequence bycatch provision provides commercial access to all fisheries. However, in practice, it is recognised that current catch may not constitute a reasonable approximation of utility. The level of current catch may be constrained by a lack of abundance or the effectiveness of fishing methods employed by different sectors.

91 Allocation of a TAC that is set above current catch can also be considered using utility-based arguments. MFish considers there is benefit in considering the initial allocation of catch in light of both current and reasonable future needs or interests in the resource. Decisions at the point of introduction to the QMS may resolve some of the problems about allocation that may occur in the short to medium term at no or minimal cost to any sector where a TAC is able to set, in accordance with the provisions of the Act, at a level above the extent of current catch.

Adaptive management framework

92 Section 8 states that the purpose of the Fisheries Act 1996 is to provide for the utilisation of fisheries resources while ensuring sustainability. Determining an appropriate level of use consistent with the purpose statement essentially involves an assessment of the risk to ensuring sustainability associated with providing the level of use necessary to enable people to provide for their social, cultural and economic wellbeing.

93 MFish recognise that there are a large number of fisheries where comprehensive and or detailed stock assessment information producing sustainable yield estimates are not available. However, this lack of assessment information should not of itself preclude consideration of adjustment to TACs in these fisheries.

94 The concept of adaptive management is a way of enabling the Crown's management obligations to be achieved and risk to be managed within accepted parameters. Adaptive management is a recognised fisheries management tool worldwide. It is a way of testing new techniques, approaches and management measures. Adaptive management may relate to assessment methods, forms of information collected, fishing methods and practices, and catch levels on a quantum, spatial, and temporal scale.

95 Two management frameworks have been developed within the overall concept of adaptive management. These are:

- The adaptive management programme; and
- The low knowledge framework.

96 The two frameworks have been developed in response to, and are intended to manage, a particular management scenario within the concept of adaptive management. Both are designed to provide an increase to the existing TAC, but in a way that best meets the characteristics of the fishery, the desired management outcomes for the fishery, and the purpose and principles of the Act.

97 The attached table provides a description of the critical elements of each framework.

Table 1: Comparison of Aims, Requirements and Outcomes of AMP and LK Bycatch Programs

	AMP	LK
Goal	• To increase TAC/TACC where information is limited to enable development.	• To ensure that TACs are set at a level considered commensurate with risk to the stock
Aim	• Development & exploration of new fishing grounds • Development of existing fishery	• Opportunity for reassessment of TACs in fisheries where TACCs are constraining utilisation and the risk of an increase is low (based on assessment of biology and available information i.e. low value bycatch stocks).
Stock Suitability	• All stocks	• Fisheries where risk of the increase is low and additional monitoring required under the AMP not necessary or unlikely to improve info on the fishery
Management	• Decision rule criteria • Reporting requirements • Stock assessment (ideal outcome)	• Decision rule criteria
Monitoring Requirements	• Stakeholder supported monitoring program	• Decision rule based on catch information
Program Review	• Two/three year review • 5 years	• 3 years if TAC undercaught
Outcome	• Stock assessment possible • TAC reviewed in light of results of monitoring program	• No SA • TAC reviewed in light of catch records only

98 The suitability of a particular framework to a fishery will depend on the nature and extent of the risk involved. If the risk to management objectives (ie ensuring sustainability) can be mitigated by the development of a stakeholder driven research/information programme then a TAC increase may be considered in that fishery under the adaptive management programme (or a fisheries plan). Alternatively if the risk can be effectively addressed having regard to existing information then a TAC increase may be possible under the low knowledge framework.

99 MFish would anticipate that development opportunities would generally be considered under the AMP. A request for development would suggest that a market is

developed or developing for a stock and therefore there is interest in increasing current catch levels. In such circumstances incentives would exist for fishers to act collectively to obtain information to support an increase in catch levels. The AMP framework provides a cost effective way of obtaining that information.

100 The low knowledge framework is suitable for stocks where risk is low, value is likely to be low, cost of research to improve information is high or not cost effective. Fisheries suitable for management under low knowledge are likely to be low value bycatch stocks within a mixed species fishery where the suite of existing TACs may require adjustment to more adequately reflect current catch ratios. A change in current abundance of one or more stocks in a mixed species fishery as a result of fishing pressure or environmental factors may mean that catch levels need to be altered. In the absence of any identifiable sustainability risk, there is the potential that such TAC adjustment could occur under the low knowledge framework.

101 A more detailed description of each framework is outlined below

AMP Framework

102 The AMP was introduced in 1991 as a basis for varying the Total Allowable Commercial Catch (TACC) levels of fishstocks for which the Ministry of Fisheries (MFish) has limited information on stock size. The programme has been developed to ensure that in taking decisions where information is limited, the Minister of Fisheries does not breach his statutory obligations to ensure stock sustainability.

103 This is achieved by defining the period for the TACC increase and providing rigorous reporting requirements and stock assessment, monitoring and decision rule criteria, which are regularly evaluated. Meanwhile, the AMP provides additional monitoring and analyses to improve the assessment of stock status and estimates of sustainable yield for those fishstocks.

104 MFish's view is that the Minister could proceed with TAC and TACC changes provided he or she is satisfied, after taking into account the purpose and principles and other relevant considerations specified in the Act, that available information and analyses suggest that:

a) there is a reasonable probability that current biomass is greater than the size that will support the MSY; and

b) on balance the new TACC and TAC level are likely to allow the stock to move towards a size that will support the MSY, or remain at or above the level that will support the MSY over the five year period of the programme.

105 In order to mitigate risk of any increase the AMP framework provides:

a) checks and balances to ensure statutory obligations for stock sustainability are satisfied, by use of:

b) monitoring programmes that are likely to detect changes in stock abundance;

c) regular reviews of progress with the AMP and its on-going ability to continue satisfying critical AMP criteria (eg fishery assessment criteria);

d) clear guidelines on intended management action through application of pre-defined decision rules with quantitative 'triggers';

e) consistent and appropriate management actions across fisheries;

f) an onus on industry to either fulfil their commitments or face a reversal of the TACC increase;

g) an incentive for industry to implement initiatives to improve the fishery assessment for a fishery at relatively low cost; and

h) for optimisation of opportunities for the stock assessment to be improved at the end of the programme.

106 The AMP framework contains a set of guidelines detailing:

a) the content of new AMP proposals (for either new or existing fisheries);

b) the fishery assessment, monitoring, and decision rule criteria applicable to new proposals;

c) the fishery assessment, monitoring, and decision rule criteria applicable to current AMP fishstocks; and

d) the annual and final evaluation process for fishstocks currently managed under the AMP programme (a final evaluation occurs at the end of five years).

107 A revised AMP framework was completed in December 2000. The revised framework creates two distinct tiers of management designed to enable fishers to explore new areas or fishing grounds for potential development, or to develop existing/established fisheries.

108 The purpose of the AMP for new/exploratory fisheries is to assist with the location of previously unknown stocks or further definition of known but currently unexploited stocks. A proposal should set out a fishing programme that will achieve that outcome. For example a stratified fishing programme with catch and effort limits by area will assist with developing knowledge about the potential distribution of a stock and minimise the risk of a stock being depleted before adequate information is obtained.

109 An existing/established fishery is a fishery, other than a new fishery, for which there is currently no estimate of stock size relative to the biomass level that will produce the Maximum Sustainable Yield (B_{MSY}) or estimate of sustainable yield available. Within this second category there will be a range of different fisheries at different levels of development and with different levels of information available or potentially obtainable from the fishery.

110 The revised framework provides for the opportunity for amendments/refinements to be made to the nature of information collected, the monitoring requirements, and the decision rules for an individual stock as part of the evaluation and review process. There is also the ability for the level of the TAC/TACC to be varied within the five year term of the AMP. The review process will allow fisheries managers to respond to new information or changes in circumstances that impact on the level at which the TAC/TACC is set.

111 The AMP framework is primarily about providing industry with an opportunity to develop a stock. However, AMP proposals are required to identify other participants

in the fishery, the potential impacts of the proposal on other fishers, and indicate possible measures to mitigate such impacts. Ideally proponents should consult with other participants in the fishery to ascertain the nature of their interests and how those interests can be taken into account.

112 It is important that proposals for management of a stock under AMP have endorsement of sufficient quota owners to ensure that the proposed programme is successfully undertaken. Use of the TAC/TACC to provide access does place the onus on fishers to work cooperatively to ensure the requirements of the AMP are met. No threshold level of participation is required. However, in putting forward a proposal with all its functional elements industry is signalling that it has accepted responsibility for carrying out those functions. Codes of practice and different monitoring strategies are often a key component of a proposal. However, in order that the Minister can place reliance on such elements of an AMP, fishers need provide to information outlining what underpins the proposals put forward in terms of agreements entered into by fishers and the level of support for those agreements. It is important to have that support in place before the AMP is approved – the ability to get support for different aspects of the AMP after the fishery has commenced, and after fishers have received additional quota and after quota and ACE has been traded is problematic. The new ACE regime imposes a new kind of demand on industry – it needs to be clear that both ITQ owners and ACE fishers support the proposal. The onus is on quota owners to obtain the agreement of ACE fishers before fishing occurs and as a condition of any sale of ACE.

113 Participants in AMP fisheries are requested to provide information in submissions about the nature of agreements entered into to support undertakings given as part of the AMP for each stock and about the level of support for complying with those undertakings from quota owners (both in terms of percentage of fishers and percentage of tonnage of fishstock). Participants should also identify what measures are being proposed to ensure that ACE fishers will comply with the AMP. MFish requests that information on these matters is provided by industry for all AMP stocks, including both existing AMP stocks and the new AMP proposals being considered this year.

114 The revised AMP framework seeks to obtain information about and monitor both the specific AMP fishstock and the effects on the aquatic environment from fishing for that fishstock consistent with the obligations contained in the Fisheries Act. The monitoring programme and decision rules for a fishstock may need to take into account the effects of fishing. The evaluation process for stocks currently managed under the AMP includes an assessment of the effects of fishing for each AMP fishstock. MFish has established a joint AMP fisheries assessment/aquatic environment working group to consider all facets relating to new AMP proposals and the performance of existing AMP stocks.

115 MFish's objective is that the information on the effects of fishing becomes a key component of the AMP. Use of appropriate indicators and identification of the types of information to be collected on a fishery by fishery basis is intended to be implemented for all AMP fishstocks including those already within the AMP, over the next several years. Potential options for advancing this issue include the establishment of a specific working group to look at this issue or proposals could be included in research planning round this year. The development of the MFish

Environmental Management Strategy may provide greater direction on the types of initiatives that could be undertaken. MFish is interested in receiving comments from stakeholders in submissions about the measures that could be adopted in respect of AMP stocks.

116 A further element of the revised AMP framework is the basis for managing a fishstock at the conclusion of management under the AMP. MFish considers that in the absence of an assessment of the status of a stock relative to the biomass that can produce the maximum sustainable yield it is still possible to manage a fishery sustainably. The ability to retain an increase to the TAC/TACC beyond the time frame of management within the AMP framework would be subject to on-going monitoring of changes in stock status and to a determination that the catch level is sustainable. A stock may successfully complete an initial period within the AMP framework but without providing estimates of stock size of sustainable yield. In such instances the stock could be managed outside the AMP. Stakeholders would need to continue to collect the same level of information as undertaken under the AMP as part of a long-term management plan, to justify retention of the TAC/TACC increase.

Low Knowledge Framework

Rationale for framework

117 Adaptive management provides the opportunity for increases to TACs where information is limited (no stock assessment is available). Historically TAC increases under the AMP have been limited to species where monitoring is likely to provide beneficial information on the stock which would eventually lead to a stock assessment. However, for a number of stocks the characteristics of the fishery (bycatch, size of increase) may make monitoring impractical or not cost effective. In some of these fisheries the risk to legislative obligations resulting from a TAC increase may be low. Utilisation of a stock may be unnecessarily restricted if the TAC for a stock cannot be increased, where risk of that increase is low, because the stock cannot meet the requirements of the AMP.

Low Knowledge framework context

118 Currently there are a number of low knowledge bycatch fishstocks where the TAC has been exceeded for a number of years. In the majority of cases there is little or no stock assessment information for these stocks but no known sustainability concerns. The TACs for these stocks have been set at historic catch level because there was little or no information available on which to determine sustainable yields prior to introduction to the QMS. In addition, catch reporting in the non-QMS environment has been historically poor, particularly for low value bycatch species, which has meant that catch limits set on historical catch at the time of introduction are often lower than catch levels in the fishery.

119 In recognition of this problem, in some fisheries (i.e those introduced into the QMS in 1998) MFish has operated a more lenient deemed value regime that has enabled fishers to land catch in excess of their available ACE/quota but not face excessive deemed value payments. In addition, fishers have also utilised the bycatch trade off scheme to manage their overcatch. The by catch trade off scheme ceased operation

from 1 October 2001 with introduction of ACE and the revised balancing regime contained in the Fisheries Act 1996.

120 The new balancing regime has placed increased focus on the TACs for a number of bycatch stocks because fishers will face increased penalties associated with the level of overcatch.

Low knowledge assessment criteria

121 Stocks are assessed against the following criteria to determine their suitability for assessment for TAC adjustment under the low knowledge framework:

- Stocks are managed under section 13 of the Act;
- There is no stock assessment information available to determine an appropriate sustainable yield for the stock;
- There are no known sustainability concerns. Information on catch relative to anecdotal information on abundance or the biology of species would suggest that the stock is likely to be close to virgin biomass or above B_{MSY} (or some proxy);
- Catch has exceeded the TACC by 20% or more for at least the last three fishing years (1999-00, 2000-01, 2001-02); and
- There has been no TACC increase for the stock for at least three years as a result of review of management controls.

122 MFish recognizes that the over catch criteria may be an issue following implementation of 1996 Act balancing regime in 2001. However, if the criteria are widened to allow increases after a shorter period of overcatch the risk of environmental perturbations, short term changes in effort or market conditions driving adjustment to TACs; and incentivising fishers to overcatch is heightened.

123 If a TAC is misaligned with other fisheries or abundance has increased, and fishers are not dumping, then overcatch will continue until behaviour of fishers changes or the TAC is altered. Considering adjustment to the TACC after three years of overcatch will further create incentive for fishers not to dump.

Balancing risk

124 Management under section 13 imposes a level of risk due to the requirement to manage at or above B_{MSY} when considering TAC options in the absence of information on status of current biomass relative to target levels. For all stocks proposed for consideration under this framework there is no information on B_{MSY}. Information on current biomass is also likely to be absent or highly uncertain. This lack of information makes assessment of risk to the stock of any increase to catch limits difficult. However, the level of risk to the stock must be balanced against the available information, in particular, consideration of the biology of stock, suitable habitat in the management area and the effect of historical fishing activity.

125 In the absence of information to suggest sustainability concerns or potential increased impact on the aquatic environment MFish believes that consideration should be given to utilization opportunity. Development of the options for alternative levels of

utilisation will have regard to the dual purpose of the Act, to provide for utilization whilst ensuring sustainability. Caution is justified in the absence of information, but caution should be balanced against the possible risk to the stock and the environmental impacts.

126 The extent of utilisation provided for needs to be assessed on a stock by stock basis having regard to risk based on the following factors:

- Information on sustainability risk to the stock;
- Biology of the stock, including potential for localised depletion;
- Information on historical catch (ie if the stock has been lightly fished and biomass is likely to be close to virgin or at least above B_{MSY});
- Likely impacts of fishing on the aquatic environment;
- Socio-economic and cultural issues; and
- Anecdotal information on abundance, including consideration of the size of suitable habitat in the management area.

127 When this analysis is linked to ongoing monitoring proposed under this framework (outlined in a later section of this paper) assessment of TACs in the manner proposed under section 13 is consistent with the Minister's legislative obligations.

Ongoing management under this framework

128 Stocks that have their TACs are adjusted under this framework would be subject to a decision rule which would require reassessment of the TAC if catch was markedly below the TAC/TACC for 3 years. Reassessment would involve investigation into the reason for the undercatch and possibly include consideration of CPUE information if this was appropriate for the species and fishing method. If it was apparent that decline in catch was not the result of fishery independent factors (ie marketing) then MFish would propose a reduction to a lower level (to be determined after assessment of available information) or, having regard to risk to the stock, agreement to maintain the current TAC in return for industry agreeing that further monitoring or research be undertaken.

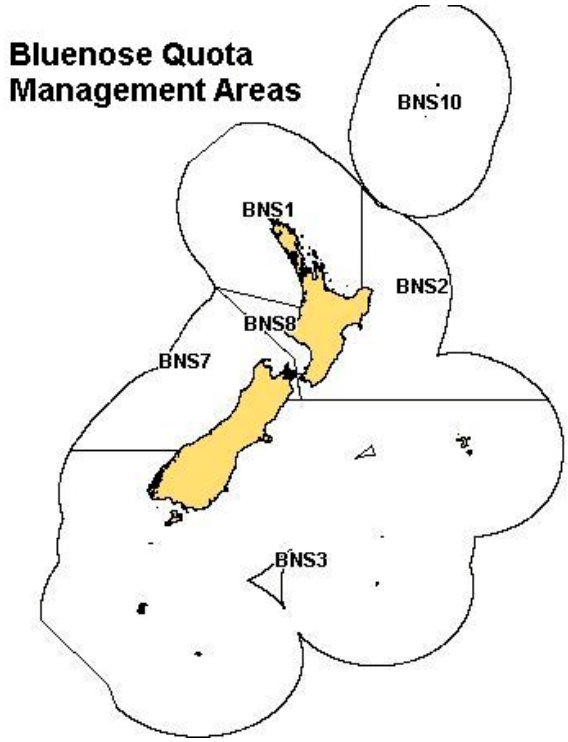
129 Stocks that have had their TACs altered under this framework could not be reconsidered for a TAC increase under the framework for three years. Although this does not preclude additional increases if the fishery entered the AMP programme, or a fisheries plan is developed which incorporates additional reporting and information gathering requirements similar to those required under the AMP.

130 MFish propose that stocks whose TACs are adjusted under this programme have their deemed value reassessed to ensure that they act as an appropriate disincentive to overcatch of the revised TACC.

Section Two

Adaptive Management Programme

BLUENOSE (BNS2) AMP PROPOSAL – INITIAL POSITION PAPER



Key Issues to be Considered

1 The key issues to be considered for the BNS 2 Adaptive Management Programme (AMP) proposal are:

a) MFish has received a proposal from the Area 2 Inshore Finfish Management Company Ltd (Area 2) to increase the Total Allowable Commercial Catch (TACC) for BNS 2 to cover existing catch levels;

b) The 2003 AMP Plenary (the Plenary) was not in a position to evaluate whether the proposal satisfied the fishery assessment requirements of an AMP due to the lack of a reliable index of abundance;

c) The relative low productivity of bluenose means that some risk is posed to the sustainability of the BNS 2 stock by the proposed TACC increase, although the stable landings over the past 13 years indicates the risk is not high;

d) There is a risk that an increase in the BNS 2 TACC could result in increased targeting of bluenose rather than being used to cover overcatch in the bycatch fishery;

e) An opportunity exists to use either the AMP or the low knowledge bycatch framework to increase the BNS 2 TACC by the same amount; and

f) The costs and benefits of the different monitoring programmes proposed under the AMP and the low knowledge bycatch options need to be assessed to determine the preferred option.

Management Options

2 The proposed management options, TAC, TACC, and allowances for BNS 2 are presented in Table 1.

Table 1: Proposed management framework, TAC, TACC and allowances (tonnes) for BNS 2

Programme	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
AMP	1 107	13	25	21	1 048
Low Knowledge Bycatch Stock	1 107	13	25	21	1 048

3 Area 2 propose to establish an AMP for BNS 2 for a period of five years beginning 1 October 2004 that will:

a) Increase the TACC by 20% from 873 tonnes to 1 048 tonnes;

b) Include a research programme with the following objectives:

i) to monitor the status of the BNS 2 stock, and associated and dependent stocks;

ii) to monitor catch and effort information after the TACC increase; and

iii) to provide an assessment of the impacts of marginal change in the fishery on the environment and a process by which these effects can be monitored and mitigated.

4 The proposed research programme will use data collected from a vessel logbook programme and a commercial catch sampling programme. Regular updates of key performance indicators of stock status will be reported to the relevant fishery assessment working group.

5 An alternative option of including BNS 2 under the low knowledge bycatch framework is also considered. Under this option the proposed TACC is also increased by 20% but no monitoring by stakeholders is required.

AMP and Low Knowledge TAC and Allowance Options

TAC

6 No TAC has been set for BNS 2 and there are no specific allowances for non-commercial fishing. However, for the purposes of varying a TACC for a quota management stock, the Fisheries Act 1996 (the Act) requires that a TAC be set under either s 13 or s 14 and that within the TAC, allowances are made for non-commercial fishing interests in that stock.

7 MFish is proposing to set the TAC for BNS 2 under s 13 of the Act because the biological characteristics of bluenose allow the maximum sustainable yield (MSY) to be estimated, the fishery is not part of any international agreement, and is not managed on a rotational or enhanced basis. Section 13 requires that the stock is maintained at, or moved towards, a level that can produce the MSY. Bluenose does

not meet the criteria for consideration under the alternative options for setting sustainability measures provided by s 14.

8 There is a lack of information to estimate stock assessment yields and the relationship of biomass to MSY for BNS 2. In the absence of stock assessment information, the proposed TAC for BNS 2 has been derived from summing the proposed TACC, together with estimates of recreational, Mäori customary harvests, and other fishing-related mortality.

Policy frameworks

9 MFish has considered the option of increasing the TAC and TACC for BNS 2 under the AMP and low knowledge bycatch frameworks. MFish prefers the AMP option as the additional monitoring required better addresses the risk to the sustainability of the BNS 2 stock.

10 The BNS 2 fishery meets many of the requirements for inclusion under the low knowledge bycatch framework. Specifically, the stock satisfies the following criteria for a TACC adjustment under the low knowledge bycatch framework:

- No stock assessment information to determine an appropriate sustainable yield;
- No known sustainability concerns for the BNS 2 stock under current landing levels;
- No TACC increase for at least three years (last increase occurred in 1996–97); and
- Average annual landings over the past three fishing years (and also the past seven fishing years) has exceeded the TACC by 20% (29% in 2000–01, 14% in 2001–02, and 19% in 2002–03).

11 However, 40-50% of the BNS 2 catch is targeted. A further portion of the catch is possibly targeted in the alfonsino mid-water trawl fishery, bringing into question whether BNS 2 is a bycatch fishery. Bluenose is also susceptible to overfishing due to its relatively low productivity (refer to Annex 1 for more biological information).

12 The proposed TACC and the allowances for recreational, customary, and other sources of mortality are the same under the AMP and low knowledge bycatch options. The main difference is the requirement for industry to implement a supporting research programme under the AMP framework. The low knowledge bycatch framework does not require any additional research. Under the low knowledge bycatch framework catch information for the fishery would be reviewed after three years (2008).

13 MFish considers the additional costs on industry under the proposed AMP is justified to provide a more reliable index of abundance. It will also provide some indication of changes in stock structure, which is important given the relatively low productivity of the stock.

Characteristics of BNS 2 fishery

14 The BNS 2 fishery is primarily a commercial fishery with a relatively small non-commercial catch. BNS 2 is the largest commercial bluenose fishery in New Zealand and comprises up to 10% of the total wetfish yield in fisheries management area 2 (FMA 2).

15 The BNS 2 fishery consists of a target longline fishery of about 30 vessels that harvest about 40-50% of the total bluenose catch. The majority of the remaining catch is taken by over 100 bottom and mid-water trawlers targeting species such as alfonsino, gemfish and hoki.

16 Bluenose catches in the longline and bottom trawl fishery has remained reasonably stable at around 400 and 200 tonnes respectively since 1990. The mid-water bycatch trawl fishery has oscillated between 50 and 500 tonnes over the past 13 fishing years, with an increasing trend in catches since the 1995–96 fishing year. However, the proportion of total catch taken by the mid-water trawl fishery has remained constant (refer to Annex 1 for more catch information).

17 Landings in BNS 2 have been relatively stable since 1990–91, and consistently higher than the TACC (refer to Table 2). High deemed value payments are occurring, particularly in the mid-water trawl alfonsino fishery. The deemed value for BNS 2 is $2.18/kg and equates to an annual deemed value payment of $357 520 in the 2002–03 fishing year. The high deemed value payments are causing a negative economic effect on industry.

Table 2: BNS 2 commercial landings (tonnes) and TACCs (tonnes) since the 1990–91 fishing year

Fishing Year	Landings	TACC
1990–91	903	833
1991–92	981	839
1992–93	1 159	849
1993–94	1 424	849
1994–95	1 235	849
1995–96	948	849
1996–97	1 117	873
1997–98	916	873
1998–99	982	873
1999–00	1 150	873
2000–01	1 125	873
2001–02	992	873
2002–03	1 037	873

Rationale for TAC/TACC increase

18 No quantitative assessment information is available to assess the status of the BNS 2 stock relative to the stock level that would produce the MSY. Fisheries independent methods of measuring relative abundance do not exist for bluenose. Research bottom trawling is not effective as bluenose are generally found over foul ground. Acoustic methods have been deemed unsuitable for estimating biomass as bluenose schools with other species.

19 With regard to fisheries dependent methods, the standardised commercial catch per unit effort (CPUE) of the longline and trawl fisheries for BNS 2 was fairly stable

between 1989–90 and 2001–01. However, commercial CPUE is not considered to be a reliable index of abundance for BNS 2. A large proportion of bluenose is caught as a bycatch by vessels targeting alfonsino, which have insufficient bluenose ACE and hence are forced to move away from areas where significant catches of bluenose are made. This behaviour means CPUE analysis fails to adequately index trends in the abundance of BNS 2.

20 Based on the above information, the Plenary was not in a position to assess whether the AMP proposal satisfied the fishery assessment requirements under the AMP framework. The Plenary was unable to evaluate the likelihood that the current BNS 2 biomass is greater than the size that would produce the MSY, or whether the proposed increase in the TACC is likely to allow the stock to move towards the size that would produce the MSY. However, the Plenary did note that annual landings in BNS 2 over the past 13 years have been stable.

21 The proposed TACC increase under the AMP and Low Knowledge Bycatch options are both 20% to cover the existing overcatch above the existing TACC. MFish considers the proposed TACC increase does not pose a high sustainability risk, given the stability of landings over the past 13 years. The TACC increase will also provide for more efficient utilisation of the BNS 2 stock, as fishers are less likely to have to modify their fishing activities to reduce or avoid catching bluenose, and the payment of deemed values.

Additional information required from Area 2

22 Discussions at the Plenary did identify a risk that an increase in ACE for BNS 2 could be used to increase effort in the target longline fishery, rather than to cover existing overcatch in the bycatch trawl fishery. Consequently, MFish seeks further information from Area 2 through the consultation process on how it plans to ensure that any additional ACE made available for BNS 2 is used in the bycatch trawl fishery. Assurances are needed that the proposed TACC will address the overcatch issue in the trawl bycatch fishery rather than being used for increased targeting of bluenose.

Adverse effects on the aquatic environment

23 MFish does not consider the proposed increase in TACC will pose a significant risk to the aquatic environment, as the increase in TACC should result in the same amount of fishing effort. There may be a risk of increased effort in the longline fishery resulting in greater incidental catches of other species including seabirds. However, this risk should be addressed by appropriate assurances from Area 2 that there will be mechanisms in place to ensure additional BNS 2 ACE is used to cover overcatch in the bycatch trawl fishery rather than increasing effort in the target longline fishery. The bottom trawl BNS 2 fishery occurs on soft-sediment substrate hence the damage to the more sensitive hard substrate is minimal in this fishery.

Impact on interests of one or more fishing sectors

24 MFish considers it unlikely that the proposed increase in TACC will affect the size and availability of bluenose for non-commercial fishers. The proposed increase in

TACC will provide for recent catch levels and is unlikely to result in an increased commercial catch of bluenose.

Recreational allowance

25 The estimate of the recreational catch of bluenose in BNS 2 in the 2000 national recreational survey is 25 tonnes. The accuracy of the estimate is uncertain as it has a high coefficient of variation. However, the survey provides the best available information on the size of the recreational catch. The Recreational Working Group is satisfied with the general methodology used in the 2000 survey, and has concluded that results from the 1996 and previous national surveys should no longer be used. MFish proposes a recreational allowance of 25 tonnes for BNS 2.

Customary allowance

26 It is likely that a small amount of bluenose is taken as customary catch in BNS 2. However, no quantitative information on the level of customary Mäori catch is available. Bluenose is considered to be of medium importance to Mäori, so it is proposed to set the customary allowance at 13 tonnes, 50% of the estimated recreational catch level.

27 In considering the proposed allowance for customary non-commercial interests, the Minister is required to take into account any mätaitai reserve or s 186A closure in the relevant QMA (s 21(4) of the Act). A small area at the northern end of Hicks Bay is subject to a s 186A temporary closure and method restriction that will expire in February 2005. MFish does not consider that this should effect any customary non-commercial allowance because the ban covers the taking of shellfish, and not finfish. There is no mätaitai reserve within FMA 2.

Other sources of fishing-related mortality

28 No quantitative information is available on the level of illegal catch or other sources of mortality. It is likely that some bluenose will be discarded by some commercial fishers that do not hold sufficient ACE to cover bycatch associated with their respective target fisheries, thereby avoiding deemed value penalties. It is also likely that some indirect fishing-mortality will occur through bluenose escaping through the net, but being fatally injured.

29 MFish considers it appropriate to include an allowance for other sources of fishing-related mortality when setting a TAC for BNS 2. In setting the TAC, MFish proposes to include an allowance of 21 tonnes for other sources of fishing-related mortality, based on 2% of the proposed TACC.

TACC

AMP option

30 The AMP proposal seeks to increase the TACC by 20% to 1 048 tonnes to cover the current over catch in BNS 2 and to generate enough ACE to allow fishers to balance landings at existing levels.

31 With regard to the AMP proposal the Plenary agreed that the following monitoring measures would be necessary:

- The use of either the new MFish or SeaFIC logbook data forms to record accurate catch positions. This could increase the power of commercial CPUE to index abundance of BNS 2; and
- Collection of bluenose biological information (e.g. length, sex, otoliths) through ongoing shed sampling – thereby providing a means to detect changes in age/size structure through the term of the AMP.

32 The AMP proposal notes the proposed monitoring programme may not provide a robust index of abundance or an estimate of sustainable yield given the characteristics of the BNS 2 fishery. However, improved catch position data provided by the AMP monitoring could lead to a more reliable index of abundance. The proposed monitoring will also provide additional information on stock status, such as changes in the age and size structure, that would give some indication of changes in fishing mortality on the exploited stock. Specifically the monitoring programme will analyse:

- Trends in BNS 2 landings and effort by trawl and longline;
- Trend in raw and standardised CPUE;
- Trends in size, age, and sex ratio of the BNS 2 catch;
- The response of the alfonsino (BYX 2) fishery to the increase in BNS 2 TACC to determine if there is any detrimental effect on BYX 2; and
- The impacts on the environment from any marginal increase in effort and catch.

33 The effectiveness of the AMP monitoring programme is reliant on the commitment of quota owners and fishers' participation in the logbook programme. Area 2 states it has a mandate from BNS 2 quota owners and fishers, as over 90% of landings of BNS 2 are caught by fishers who contribute a voluntary levy to this stakeholder company. MFish considers that at least 50% of ACE holders in BNS 2 will need to participate in the logbook programme to provide an adequate level of coverage.

34 MFish proposes the following additional requirements for monitoring of the AMP, by Area 2:

a) formally demonstrating a commitment by at least 50% of ACE holders to participate in the logbook and monitoring components of the AMP before 1 October 2004; and

b) providing annual updates to MFish on the compliance with keeping of logbooks, collection of biological information, and monitoring of fishing-related mortality.

35 The Plenary regards decision rules for the proposed AMP as unnecessary because a full analysis of all the information gathered every 2-3 years is a more effective way to review the performance of the stock. Accordingly, the proposed AMP does not include a decision rule. Instead, Area 2 will monitor the AMP on an annual basis and

report back on the research to the relevant Fishery Assessment Working Group. The AMP will also be reviewed by the Plenary in 2007 and at the completion of the AMP in 2010.

Low knowledge bycatch framework option:

36 The BNS 2 fishery meets many of the requirements for inclusion under the low knowledge bycatch framework. However, the fit of BNS 2 with the low knowledge bycatch framework is uncertain as 40-50% of the BNS 2 landings is targeted.

37 Under the low knowledge bycatch framework, the proposed TAC incorporates the same allowances for non-commercial interests and other sources of fishing-related mortality as proposed under the AMP framework.

38 Setting the TACC under the low knowledge bycatch framework is based on the average commercial landings over the past three fishing years, or according to the landing in the most recent fishing year. For BNS 2 the average commercial landing for the past three fishing years would equate to a 21% increase in the TACC, while using the landings from the most recent fishing year would equal an increase of 19% in TACC. There is little difference between these options and the 20% increase proposed under the AMP. MFish considers an increase of 20% is most appropriate under the low knowledge bycatch framework, as it represents the average annual landings for BNS 2 over at least the past seven years. Under this approach, the proposed TACC would be increased from 873 tonnes to 1 048 tonnes (20% increase). The same increase as proposed under the AMP option.

39 The main difference between the options is the requirement for industry to undertake the proposed research programme (including additional monitoring) under the AMP. Industry would not be required to undertake this programme under the low knowledge bycatch framework. Given the likely additional costs to carry out the proposed monitoring it is unlikely that the industry would undertake the research programme if the TACC was increased using the low knowledge bycatch framework.

40 Under the low knowledge bycatch framework, catch information for the fishery would be reviewed after three years (2008). If catch levels are found to be markedly below the proposed TACC after this time consideration would be given to reducing the TACC. The impact of changes in effort, and fishery independent factors, such as marketing, would be taken into account to decide whether the TACC should be reduced.

Analysis of options

41 Evaluating the benefit of the monitoring proposed under the AMP is a key factor in deciding whether the AMP or low knowledge bycatch framework is the best option.

42 MFish prefers the AMP option for the following reasons:

- The proposed increase in the TACC poses some risk due to the low productivity of bluenose, the lack of information on stock status, and the lack of a robust index of abundance;

- The proposed monitoring under the AMP is required, as it will provide a better indication of changes in stock structure, and could conceivably lead to a more reliable index of abundance;

- The monitoring programme will provide significantly more information on BNS 2 and a greater ability to detect sustainability concerns through annual analysis of monitoring information and reporting to the Plenary in 2007;

- The AMP provides information on the impact on associated species, such as the alfonsino (BYX 2) fishery from the increase in the BNS 2 TACC;

- BNS 2 does not meet all the requirements of the low knowledge bycatch framework, as it is not solely a bycatch fishery; and

- The extra cost of the AMP is insignificant compared to the potential savings in deemed values that the AMP provides.

Future Management

43 The AMP for BNS 2 is proposed to run for five years beginning 1 October 2004. Area 2 would monitor the fishery each year and report back to the Plenary in March 2007 and 2010. MFish is likely to be undertaking further surveys to determine the levels of recreational catch (including BNS 2) over the term of the AMP, and estimates of customary Mäori catch may also be available under the Fisheries (Kaimoana Customary Fishing) Regulations 1998.

44 Depending on the outcome of the AMP and revised estimates of non-commercial catches, MFish would propose the reconsideration of sustainability and utilisation measures for BNS 2. This could allow the different management objectives of the sectors to be taken into account when allocating access to the respective sectors under any revised estimate of sustainable yield. A key consideration at the completion of the AMP would be whether or not the TACC should revert back to the current level.

45 Under the low knowledge bycatch framework, a review of the performance of the fishery will be conducted in 2008. A summary of proposed management actions under the proposed AMP and low knowledge bycatch frameworks are shown in Table 3.

Table 3: Proposed management actions under the AMP and Low Knowledge Bycatch framework (LK)

	Initial assessment	Monitoring	Program review	Trigger points	Outcome
AMP	March 2007	o New CPUE data collected o New commercial catch sampling programme	March 2010	No decision rule proposed	More information on stock status
LK		o Catch information o Existing CPUE indices	2008	No decision rule proposed	Catch information

Conclusion

46 MFish supports increasing the TACC for BNS 2 to 1 048 tonnes under the AMP framework. The proposed increase in TACC covers existing over catch of the present TACC of 873 tonnes. The proposed increase in TACC will better provide for utilisation by allowing fishers to more efficiently fish target species such as alfonsino and bluenose without having to pay deemed values. MFish considers the increase in TACC poses a relatively low sustainability risk given the stability of BNS 2 landings over the past 13 years, and especially when supported by the proposed AMP research programme.

47 An increase in ACE for BNS 2 could be used to increase effort and catch in the target longline fishery rather than to cover the overcatch in the bycatch trawl fishery. To address this risk, Area 2 is invited to provide additional information on how it plans to ensure that any additional ACE for BNS 2 is used in the bycatch trawl fishery to address the current overcatch in this fishery.

48 MFish does not consider the proposed increase in TACC will pose a significant risk to the aquatic environment, as the increase in TACC should result in the same amount of effort and catch. The proposed increase in TACC is also unlikely to affect the size and availability of bluenose for non-commercial fishers, as the commercial catch of bluenose is likely to remain the same. The relevant statutory considerations have been taken into account in determining the proposed management options for BNS 2 (refer to Annex 2).

49 The BNS 2 fishery meets many of the requirements for inclusion under the low knowledge bycatch framework, and MFish has considered increasing the BNS 2 TACC under this framework. The proposed TACC increase, and the recreational, customary and other sources of mortality allowances are the same under the AMP and the low knowledge bycatch options. The main difference is the proposed research programme (including additional monitoring requirements) under the proposed AMP.

50 MFish prefers the AMP option for increasing the BNS 2 TACC because the proposed research and monitoring arrangement will provide a better indication of changes in stock structure, and could conceivably lead to a more reliable index of abundance. The supporting research programme will reduce the risk associated with the proposed increase in the TACC for BNS 2.

Preliminary Recommendations

51 MFish proposes to include BNS 2 under the AMP framework that will:

a) set the TAC at 1 107 tonnes;

b) make an allowance of 13 tonnes for customary interests, 25 tonnes for recreational interests, and 21 tonnes for other sources of fishing-related mortality; and

c) increase the TACC by 20% from 873 tonnes to 1 048 tonnes.

ANNEX ONE

Biological Characteristics

52 Bluenose are found on many continental slopes in New Zealand, Southern Australia, South Africa and isolated locations in the Southern Indian Ocean. Bluenose are thought to primarily inhabit rocky reef areas, although schools of bluenose have been observed and captured over more open seafloor. Bluenose are often found foraging in mid-water, but are also known to feed on benthic fish and crustaceans.

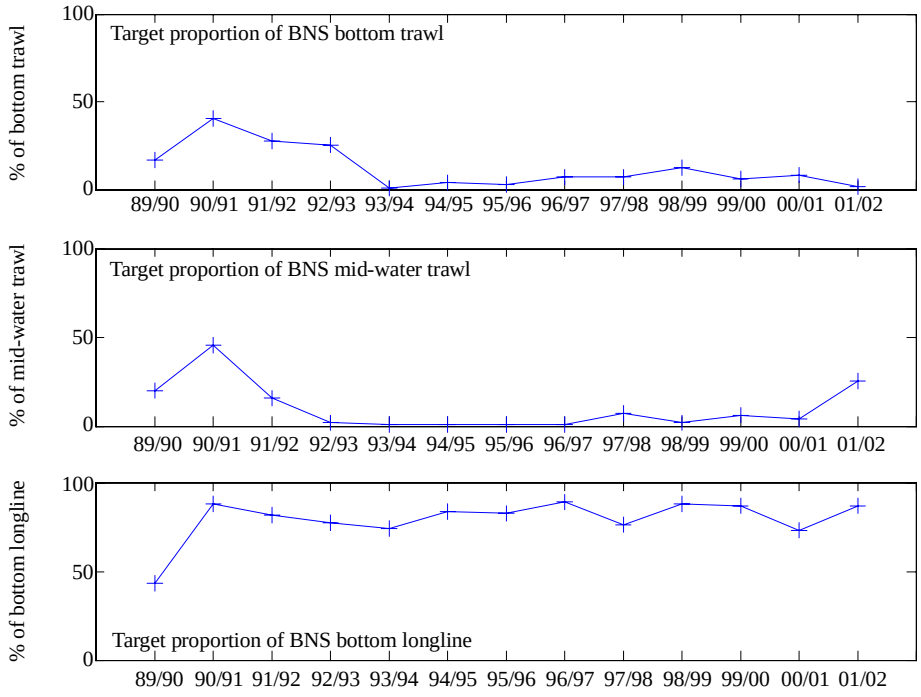
53 Little is known about the reproductive biology of bluenose. Spawning probably begins in late summer and may span several months. No distinct spawning grounds are known.

54 Initial research concluded that bluenose are fast growing. However, more recent research suggests that bluenose are in fact much slower growing and may live to 40-50 years old. As such, bluenose are more susceptible to the effects of overfishing than previously thought. Bluenose are typically caught at a length of 50-70 cm and are 5-10 years old at this age. Bluenose are only just, or have yet to become, sexually mature at this length.

Commercial Catch Information

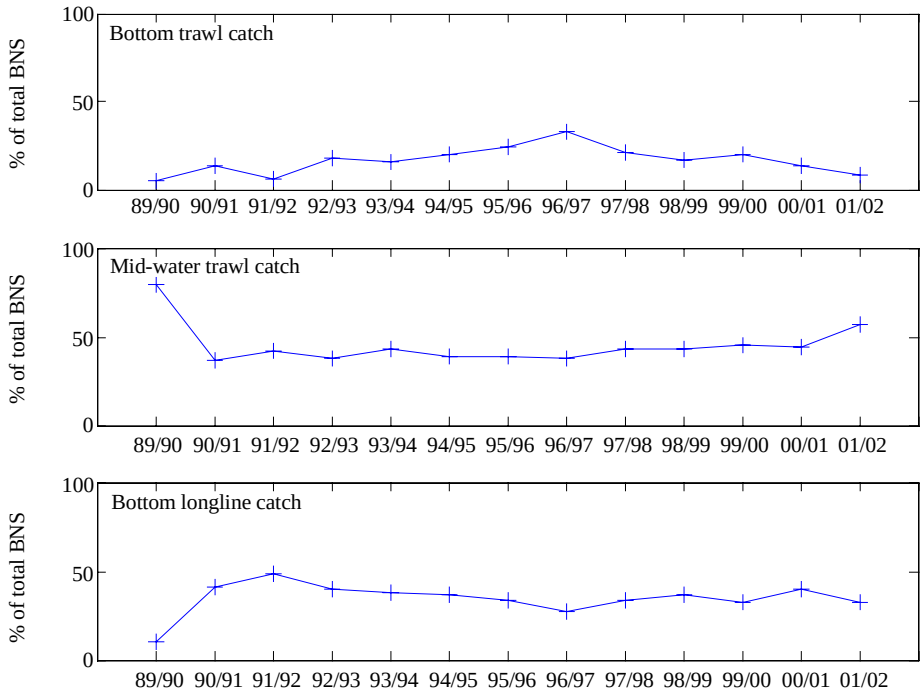
55 The BNS 2 fishery is made up of a targeted longline fishery (40-50% of total catch) and a bycatch trawl fishery (refer to figure 1).

Figure 1: Proportion of targeted bluenose catch taken by bottom trawl, mid-water trawl and bottom longline.



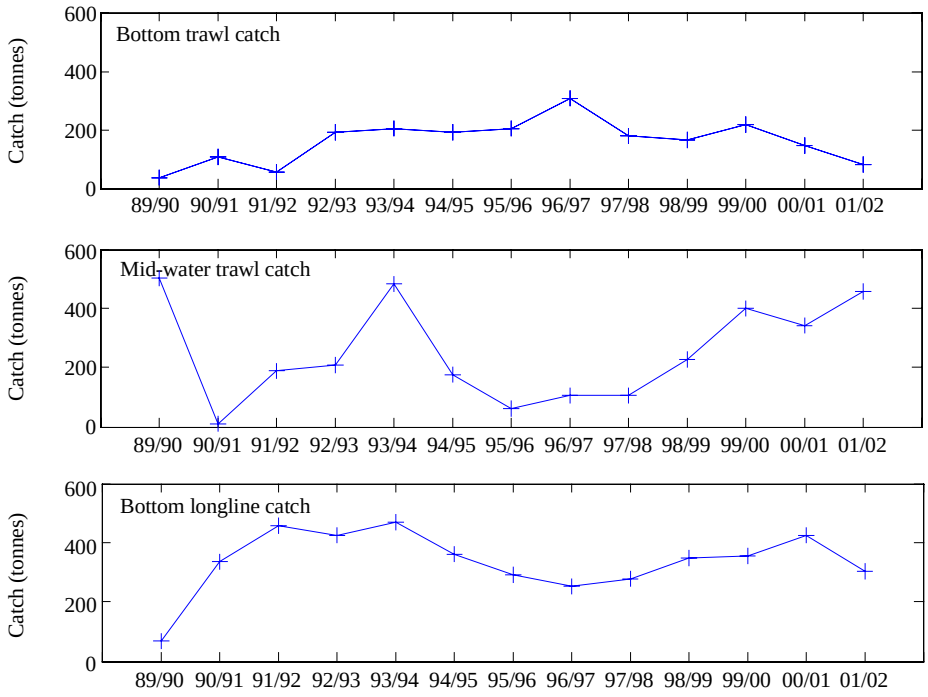
56 The proportion of the BNS 2 catch caught by each method has remained relatively constant since 1990– 91, although there was an increase in the mid-water trawl fishery in 2001–02 (refer to figure 2).

Figure 2: Proportion of BNS 2 catch (%) by method.



57 The actual catch of bluenose by method is far more variable (refer to figure 3). The mid-water trawl catch has increased since the 1996–97 fishing year, while the bottom trawl catch has decreased.

Figure 3: Total catch of BNS 2 (tonnes) by method over the last 13 fishing years.



58 Of all the trawl fisheries, the alfonsino (BYX) target fishery catches the greatest proportion of bluenose caught by trawl in BNS 2 (refer to table 4). The change in the amount of bluenose caught in the BYX 2 trawl fishery does not appear to be closely linked with changes in the total catch of BYX 2. In the 2001–02 fishing year the proportion of bluenose caught in the target trawl fishery significantly increased.

Table 4: **Catch (tonnes) of BNS 2 for each trawl fishery targeting different species and their contribution to the total catch of bluenose in all trawl fisheries, and the total catch of BYX 2.**

Fishing Year	Bluenose Catch in trawl fishery by target species (tonnes)						BYX 2 catch	Proportion (%) of total BNS trawl catch					
	BNS	BYX	SKI	HOK	CDL	Other		BNS	BYX	SKI	HOK	CDL	Other
1989/90	116	426	15	5	2	11		20	74	3	1	0	2
1990/91	191	167	12	31	5	26	1459	44	39	3	7	1	6
1991/92	77	313	25	17	2	24	1261	17	68	5	4	0	5
1992/93	55	368	113	18	2	55	1649	9	60	18	3	0	9
1993/94	1	503	167	32	26	31	1688	0	66	22	4	3	4
1994/95	10	346	84	51	34	52	1670	2	60	15	9	6	9
1995/96	6	319	66	95	25	13	1868	1	61	13	18	5	2
1996/97	22	243	146	142	32	39	1854	4	39	23	23	5	6
1997/98	37	240	36	144	22	17	1652	7	48	7	29	4	3
1998/99	13	351	16	70	30	21	1658	3	70	3	14	6	4
1999/00	44	437	24	78	51	26	1857	7	66	4	12	8	4
2000/01	28	398	53	92	14	14	1665	5	66	9	15	2	2
2001/02	134	389	14	37	17	13	1574	22	65	2	6	3	2

59 The longline fishery in BNS 2 has primarily operated in the northern and central regions of FMA 2 over the last 13 years. There has been no abrupt changes in the distribution of effort over this period. Effort in the trawl fishery has been primarily directed towards the central and southern regions of FMA 2 . There appears to be no evidence of serial depletion occurring in BNS 2 over the last 13 years as all regions are still fished.

ANNEX TWO

Statutory Considerations

60 In forming management options the following statutory considerations have been taken into account:

TAC

61 The purpose of the Act (as provided in s 8) is to provide for the utilisation of fisheries resources while ensuring sustainability. The current TACC presently inhibits the efficient utilisation of the BNS 2 resource, as well as the associated target fisheries. The proposed increase in TACC for BNS 2 seeks to address a management problem by increasing the TACC to reflect current catch levels. Accordingly, the proposed TACC increase is consistent with the purpose of the Act to provide for better utilisation of the fishery, while ensuring catch levels remain sustainable. As such, the proposed TAC, TACC, and allowances would enable people to provide better for their social, cultural and economic well-being.

62 A TAC set under s 13(2) of the Act should be set at a level that moves the stock towards a level that can produce the MSY. That level is currently unknown for BNS 2. However, the proposed increase in TACC to cover current catch levels is unlikely to cause sustainability concerns as landings in BNS 2 have been relatively stable for the past 13 years. MFish is not aware of any sustainability concerns about catches at current levels.

Environmental

63 The proposed TAC options are based on:

a) No specific environmental conditions affecting the stock have been identified (as required to be considered under s 13(2)(b)(ii));

b) Biological characteristics of the stock have been considered in setting the proposed TAC (as required to be considered under s 13(2)(b)(ii)). The relatively low productivity of bluenose has been considered when deciding what monitoring is required in association with the proposed increase in TACC;

c) There is no information to suggest the interdependence of stocks should affect the level of the TAC set for BNS 2 at this time (as required to be considered under s 13(2)(c)). A range of important inshore species is associated with bluenose due to the use of mid-water and bottom trawl nets for commercial harvesting. The three most significant commercial species associated with BNS 2 catches are alfonsino, gemfish, and hoki, all of which are managed under the QMS;

d) Section 9(a) requires that associated or dependent species (non-harvested species) should be maintained above a level that ensures their long-term viability. The longline component of the fishery has the potential to result in

incidental catches of other species including seabirds. At present little quantitative information on seabird bycatch in the BNS 2 longline fishery is available. The proposal that the increase in TACC will not result in increased catch and effort in the longline fishery means the marginal impact of the proposal is likely to be insignificant;

e) Section 9(b) requires that the biological diversity of the aquatic environment should be maintained. The proposed increase in TACC will cover existing landings and is unlikely to result in an increase in effort and catch in the BNS 2 fishery. Therefore, the risk posed to the aquatic environment by the proposed increase in TACC is considered low; and

f) Section 9(c) of the Act requires that habitats of particular significance to fisheries management should be protected. No habitats of particular significance to fisheries management are known that might be affected by the BNS 2 fishery, and none are specifically protected from the effects of fishing for bluenose.

Allocation

64 Section 13(3) requires consideration of relevant social, cultural and economic factors when determining the way and rate in which a stock is moved towards or above B_{MSY}. The economic benefits that will be realised under the proposed TAC include fishers being able to maintain current landing levels in BNS 2 without having to pay deemed values. MFish also anticipates that fishers will be able to more efficiently and effectively utilise associated stocks under a higher TACC for BNS 2.

65 The nature of the fishery and the interests of recreational and customary fishers have been considered in setting the TAC. No mātaitai exists in the QMA. No area has been closed or fishing method restricted (that affects the fishery within BNS 2) under the customary fishing provisions of the Act. No restrictions have been placed on fishing in any area within the QMA for recreational interests (s 21(4), and (5)).

Miscellaneous

66 MFish is unaware of any information on the natural variability of the BNS 2 stock as required to be considered by s 11(1)(c).

67 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). There are no international obligations specific to bluenose. MFish considers that issues arising under the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for BNS 2 (as required to be considered under s 5(a) and s 5(b)).

68 Apart from the existing TACC, other existing fisheries management controls for BNS 2 include the following (s 11(1)(b)):

- A minimum net mesh size of 160 mm apply in BNS 2; and
- Trawling is prohibited by fisheries regulation from some inshore areas within BNS 2. These areas are described in the Fisheries (Central Area Commercial Fishing) Regulations 1986.

69 No fisheries plans exist or are proposed that would otherwise have to be taken into account when setting the TAC for BNS 2 (as required to be considered under s 11(2A)(b)).

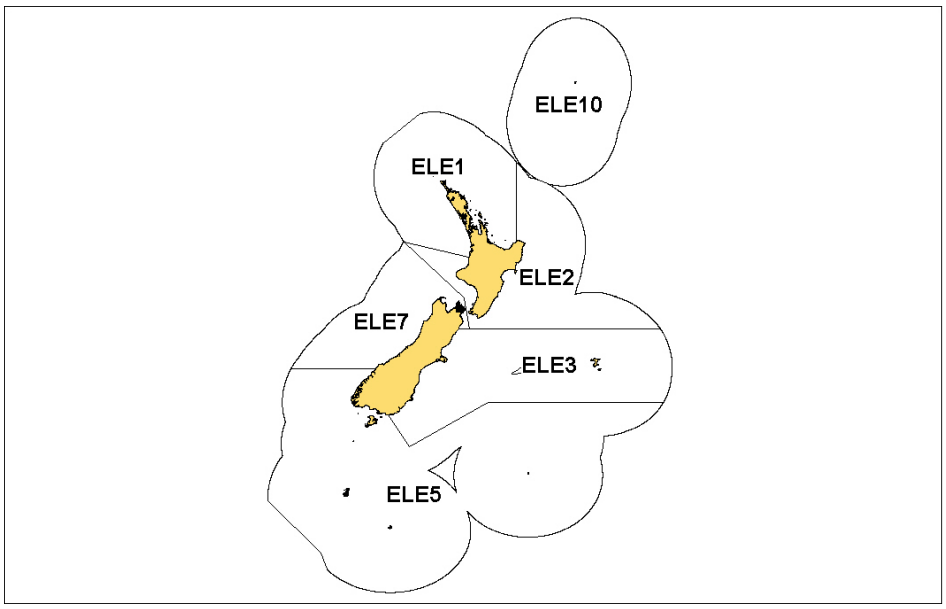
70 Before setting or varying any sustainability measure the Minister must take into account any conservation or fisheries service, or any decision not to require such services (s 11(2A)(a)&(c)). MFish does not consider that existing or proposed services materially affect this proposal for BNS 2. No decision has been made to require or not require a service in this fishery.

71 MFish is not aware of any provisions 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 of any sustainability measure for BNS 2 (s 11(2)(a)&(b)).

72 MFish considers that the best available information on the status of BNS 2 is the information used to support the BNS 2 proposal, and the minutes of the Plenary. There is no other stock assessment information on bluenose, other than generalised descriptions of biology and distribution. 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. In accordance with s 10 of the Act, the absence of information should not be used as a reason to postpone, or fail to take, any measure to achieve the purpose of the Act, including providing for utilisation at levels considered to be sustainable.

ELEPHANT FISH 5 (ELE 5) - INITIAL POSITION PAPER

Figure 1. Map showing the boundaries of ELE 5



Key Issues to be Considered

1 The key issues to be considered for ELE 5 are:

a) MFish has received a proposal from the South East Finfish Management Limited (South East FML) to increase the TACC for ELE 5 by 20% from 100 tonnes to 120 tonnes for a five-year period under the adaptive management programme (AMP);

b) The proposed 20% increase to the ELE 5 TACC is to cover current over-catch on the grounds that ELE 5 is increasing in abundance and is an unavoidable bycatch of the FLA 3 bottom trawl fishery;

c) Approximately 90% of the annual catch of ELE 5 is taken by bottom trawling for flatfish and, to a lesser extent, in the stargazer trawl fishery in Foveaux Strait (statistical areas 025 and 030). The remainder is taken by target set-netting (6%) and as a bycatch from the rig and school shark set net fishery;

d) While currently in the AMP with a TACC of 100 tonnes, at a TACC of 120 tonnes, ELE 5 does not meet all the MFish policy criteria for either a new AMP or the low knowledge bycatch stocks programme;

e) The 2003 AMP plenary (Plenary) agreed that the ELE 5 fishstock, with a TACC of 120 tonnes, could be considered for inclusion in the AMP;

f) Although the standardised catch-per-unit-effort (CPUE) has declined in both of the relevant statistical areas (025 and 030) since the 1999-2000 fishing year, the fishers contend that high deemed values for ELE 5 have resulted in

avoidance or discarding without reporting and, therefore, negatively biased CPUE (as an index of abundance);

g) The current TACC of 100 tonnes has been exceeded in each of the last five fishing years, averaging 120 tonnes per year over this period;

h) The industry argue that, given the requested increase in TACC, fishers would no longer need to avoid/discard elephant fish and that trawl CPUE would therefore improve as an index of abundance; and

i) The ELE 5 AMP is being considered for a fishstock where there is a threatened population of Hector's dolphins. But, MFish consider there is little likelihood of an increase in fishing activity as a result of an increase in ELE 5 TACC and, therefore, little likelihood of a change in the level of interactions with marine mammals and seabirds.

List of Management Options

Table 2: Proposed management framework, TAC, TACC and allowances (tonnes) for ELE 5

Options	TACC tonnes	% TACC increase	Proposed TACC	Customary	Recreational	Proposed Other sources of Mortality	TAC
AMP	100	20%	120	5	5	6	136

2 South East FML proposes that ELE 5 be included in the AMP for the five-year period from 1 October 2004 to 30 September 2009 and that the programme will:

a) increase the TAC from 110 tonnes to 130 tonnes;

b) increase the TACC from 100 tonnes to 120 tonnes;

and South East FML will:

c) assume responsibility for development of trawl bycatch CPUE, from the flatfish target fishery, as a measure of abundance for ELE 5;

d) assume responsibility for implementing a SeaFIC logbook programme to provide high spatial resolution for ELE 5 catch and effort;

e) assume responsibility to include in the log book programme the collection of biological information through sampling the trawl catch to detect changes in age/size structure; and

f) maintain a voluntary code of practice to reduce the risk of Hector's dolphin or seabird bycatch in the ELE 5 fishery.

3 MFish proposes that the AMP should also include the following measures:

a) the addition of 2% of the proposed TACC as an allowance for other sources of fishing related mortality;

b) industry to formally demonstrate a commitment to the logbook and monitoring components of the AMP and that this be in place prior to 1 October 2004;

c) an annual review of the performance of the log book programme; and

d) annual reporting by the proponents on their monitoring programme for set net and trawl interaction with marine mammals and seabirds.

Rationale for Management Options

Policy frameworks

4 No TAC was set for ELE 5 when it was introduced into the QMS in 1986[1]. However, a TAC, including allowances, was set in 2001. When varying a total allowable commercial catch (TACC) for a quota management stock, the Fisheries Act 1996 (the Act) requires that a TAC be set under s 13 or s 14 and that, within the TAC, allowances are made for non-commercial fishing interests in that stock. MFish is proposing to vary the TAC for ELE 5 under s 13 of the Act because the biological characteristics of elephant fish allow an MSY to be estimated, commercial catch limits of ELE 5 are not part of any international agreement, and the fishery is not managed on a rotational or enhanced basis.

5 When varying the TAC for ELE 5, a number of statutory obligations imposed by the Act have to be taken into account. These factors, which are considered before setting sustainability measures for ELE 5, are considered in detail in the Statutory Obligations and Policy Guidelines section (Annex 1).

6 Only one option is proposed, a TAC increase under an AMP. ELE 5 does not meet all of the criteria for consideration of a TAC increase under either the low knowledge bycatch fishery framework or the AMP framework. However, MFish considers that an increase to the ELE 5 TAC is better addressed within an AMP than under the low knowledge bycatch fishery framework as:

a) ELE 5 is currently managed within the AMP;

b) The plenary has agreed that the increase in ELE 5 TACC could be considered for inclusion in the AMP;

c) Management under a low knowledge bycatch framework offers less opportunity to manage the risk of a significant TAC increase and does not develop an index of abundance from which to evaluate the likelihood of current biomass relative to B_{MSY} or whether stock abundance is stable at the increased catch level;

d) Commercial catches have exceeded the current TACC for the past five years;

e) There is some limited stock assessment information available for ELE 5 (biological, and CPUE information);

f) Management of ELE 5 under an AMP reduces the risk associated with the increase to the TAC as the proposed AMP has appropriate monitoring and reporting arrangements to detect changes in abundance (see Annex 1); and

[1] A TAC was set, but it was equivalent to a TACC as no allowances were provided for non-commercial fishers or for other sources of fishing-related mortality

g) The proposed TAC increase is unlikely to increase the risk of mortalities of marine mammals and seabirds. But the additional monitoring required under the AMP will provide information on set net and trawl interactions with marine mammals and seabirds.

TAC

7 At the time of introduction into the QMS, elephant fish in Southland were considered severely overfished and the commercial catch was initially set at a low level (71 tonnes) to facilitate stock recovery. In October 2001, the TACC for ELE 5 was increased to 100 tonnes within the AMP, as plenary concluded there was a reasonable probability that the stock was above the size that would support the MSY. The Minister of Fisheries agreed to raise the TACC while also setting a TAC of 110 tonnes, providing an allowance of 5 tonnes each for the customary and recreational fisheries.

8 In 2003, South East FML proposed a 20% increase in the TACC for ELE 5 on the grounds that it will be difficult to stay within the current TACC over the next 5 years. MFish also proposes a change to introduce an allowance for "other sources of fishing-related mortality". At pupping time, small non-commercial sized elephant fish are vulnerable to trawling and an allowance (5% of the TACC) will be added to the TAC. No changes are proposed for the recreational and customary allowances. Accordingly, the TAC will require an adjustment should the proposal proceed. In that eventuality, the ELE 5 TAC would be increased by 26 tonnes to 136 tonnes.

9 ELE 5 is substantially a bycatch fishery with the potential to constrain the target species fisheries. Catch has exceeded the TACC every year for the last five years while also, anecdotally, avoidance and discarding without reporting has been occurring. There is no information that directly indicates sustainability concerns, however, this fishery has previously been depleted and it is widely accepted that elasmobranches are vulnerable to over fishing.

10 Without an index of abundance, the plenary was not in a position to evaluate the likelihood that current biomass was above B_{MSY}, whether the proposed TAC would allow the stock to move toward B_{MSY}, or whether stock abundance had remained stable at the current catch levels.

11 The proposal to increase the TACC to 120 tonnes for ELE 5 does not meet all the criteria for consideration to be included within an AMP, nor does it meet all the criteria for a TACC increase under the low knowledge fishery framework. However, plenary agreed that the proposal could be considered for inclusion in the AMP.

12 While standardised CPUE has declined in both of the relevant statistical areas (025 and 030) since the 1999-2000 fishing year, fishers argue that high deemed values for ELE 5 have resulted in avoidance or discarding and, therefore, a negative bias in CPUE (as an index of abundance).

13 Other effort data shows little change over the previous five fishing years, however, due to low spatial resolution in the effort data, plenary could not establish the extent to which the ELE 5 catch could be influenced by a shift in fisher behaviour.

14 The TAC/TACC levels can be reviewed if, on the balance of probabilities, it is detected that the catches under the AMP are causing the stock size to move below the level that will produce the MSY.

15 Given this situation, MFish considers that any TAC increase to cover existing bycatch would require a cautious approach and monitoring. This would best be achieved under the AMP process.

16 MFish considers that it is unlikely that the proposed increase to the ELE 5 TAC will significantly increase adverse impacts on the threatened Hector's dolphin. The proposed 20% increase to the ELE 5 TACC is to cover current over-catch and, therefore, there is little likelihood of an increase in fishing activity or in the level of interactions with marine mammals and seabirds. South East FML has measures in place (voluntary code of practice) to mitigate and report on impacts on Hector's dolphins. South East FML is also developing an independent monitoring programme based on video observations.

17 MFish notes, however, that there is a lack of information pertaining to marine mammal and seabird interactions in the ELE 5 fishery. South East FML is strongly encouraged to complete the video monitoring trials being conducted in the ELE 3 area and to implement an appropriate monitoring programme for ELE 5 as soon as practicable. The ELE 5 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

18 In the absence of stock assessment information, proposed TACs for fisheries are usually based on known or estimated levels of recreational, Mäori customary, and commercial catch together with an estimate of all other sources of fishing-related mortality. In the absence of stock assessment information this is the best information available on which to set a TAC that maintains the stock at or above the level that can produce the maximum sustainable yield. Accordingly, the proposed TAC for ELE 5 has been derived by summing the proposed TACC, under the AMP, together with estimates of recreational, Mäori customary harvests, and other sources of fishing-related mortality.

Monitoring

19 Under the current AMP monitoring, the responsibility for monitoring has rested with the setnet fishery. However, given that fisheries-independent stock biomass is difficult to obtain for ELE 5, South East FML has proposed to derive ELE 5 relative abundance CPUE indices from the FLA 3 trawl fishery, which accounts for 70-90% of the annual landings. Supplementary information will be obtained from logbooks to monitor any changes in fishing behaviour that may affect the ability of commercial CPUE to monitor the abundance of ELE 5. The plenary noted that it is necessary to determine a greater degree of spatial resolution for the catch and effort data in order to give clarity to the relationship between fishing patterns and the increased catch of elephant fish. Collection of biological information is also proposed to detect any changes in age/size structure.

20 MFish considers that monitoring (as agreed by the plenary for the AMP) of commercial CPUE, a logbook scheme, and collection of biological information is likely to monitor any risks to the sustainability of ELE 5 at the increased TACC level.

Plenary also considered that a decision rule is not necessary. A full analysis of all information every 2-3 years is a more effective way to review the performance of the stock.

21 South East FML will be responsible for monitoring CPUE, the voluntary logbook programme, and collection of biological information during the duration of the AMP. An annual review by MFish will evaluate the performance of this in regard to those monitoring commitments. South East FML is also responsible for providing information, including CPUE and biological information, for a full review of the ELE 5 AMP at the AMP Working Group meeting in March 2007, when two years of data will be available and in 2010 at the end of the five year programme.

22 MFish notes that sustainability concerns did arise when the fishery was fished above 120 tonnes in the 1980s and believes that the logbook scheme is fundamental to address this concern. Accordingly, MFish is of the view that in setting the TACC at 120 tonnes, industry would need to formally demonstrate a commitment to the logbook and monitoring components of the AMP.

TACC

23 The proposed TACC is 120 tonnes, being the average catch over the last five years.

24 ELE 5 quota was being traded at $6 600 per tonne (as at 30 September 2003), with ACE traded at an average price of $567.70 per tonne. There were 23 quota owners in the fishery, and 35 ACE holders.

25 The proposed increase has economic benefits in the short term. The port price was $2 502.80 per tonne (as at 30 September 2003), so that the 20 tonne increase in the TACC has a gross value of $50 050 at the wharf. While fishers are already harvesting at this increased level, the economic benefits will result from the reduction in deemed values paid.

26 Longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

27 There should also be economic benefits that extend from this cost-effective gathering of information from the fishery. The information could result in improved assessment of the ELE 5 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery. On the other hand, increasing the ELE 5 TACC, as proposed, has some economic costs because of the required monitoring now including the FLA 3 trawl fishery. However, as ELE 5 is already within the AMP, not all of the costs of monitoring will be new costs.

28 MFish considers that the proposed increased ELE 5 TACC is unlikely to affect the size and availability of elephant fish for non-commercial fishers.

Customary and recreational

29 Neither the 1999-2000 nor the 2000-01 recreational fishing surveys provide information about the recreational catch in ELE 5. In the absence of any additional information, it is not proposed to review the recreational allowance. Similarly, records of authorised customary take of elephant fish (reperepe) don't offer any information about customary take in ELE 5. While it is anticipated that, over time, information about the customary take will be forth coming, in the absence of any information indicating a need for review, it is not proposed to review the customary allowance. As the proposed TACC increase to 120 tonnes is intended to cover existing catch, it is not anticipated that there will be any new implications to customary and recreational fisheries. Therefore, there are no proposed changes for customary or recreational allowances.

Other sources of fishing-related mortality

30 The significance of other sources of fishing related mortality has not been documented, however, juveniles are vulnerable to incidental trawl capture and are of little commercial value. MFish conclude that the characteristics of the fishery support some fishing related mortality being likely. In the absence of quantitative information, MFish propose to set an allowance of 5% of the proposed TACC, being six tonnes.

Future Management

31 The AMP programme for ELE 5 is proposed to run for five years. The AMP will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two years. At the end of the five year programme, the results of the proposal will be reviewed in detail. Depending on the information derived, it might be possible to undertake a formal stock assessment of ELE 5. This could be done directly by industry or through the MFish-managed research services procurement process.

32 MFish will be undertaking further surveys to determine the levels of recreational catch (including ELE 5) over the next five years, and estimates of customary Mäori catch might also be available from reporting under the Fisheries (South Island Customary Fishing) Regulations 1999.

33 Depending on the outcome of the programme, stock assessment, and revised estimates of non-commercial catches, MFish would propose the reconsideration of sustainability and utilisation measures for ELE 5.

34 A key consideration at the completion of the five-year period will be whether or not the TAC should revert back to the current level. The AMP is primarily intended as an information gathering mechanism to assess whether or not a stock is capable of providing a greater yield. The alternative to the AMP is that conventional stock assessment techniques are employed to assess the fisheries yield – these techniques do not necessarily involve an increase in the TAC and TACC.

Conclusion

35 South East FML has proposed an increase to the ELE 5 TACC from 100 tonnes to 120 tonnes under a five-year AMP. Catches have exceeded the TACC in each of the five previous fishing years, averaging 120 tonnes per annum over that period.

36 The main objective of the AMP proposal is to provide adequate ACE to encourage fishers to accurately report catch and remove the need for avoidance behaviours as fishers contend these are currently negatively biasing CPUE analysis. This, plus provision of greater spatial resolution in recording catch and effort data and biological sampling of elephant bycatch, should provide confidence in CPUE as an index of abundance.

37 MFish considers that annual monitoring and review of the commercial fishery performance in the AMP will be adequate to detect and manage any sustainability issues that might arise during the programme. However, MFish regards the logbook and monitoring as the key to delivering the advantages of the AMP and, therefore, will be reluctant to consider an increase above 100 tonnes unless a formal agreement exists for the logbooks to be in place before 1 October 2004.

38 MFish considers that the proposed increased ELE 5 TACC is unlikely to affect the size and availability of elephant fish for non-commercial fishers.

39 The ELE 5 AMP is being considered for a fishstock where there is a threatened population of Hector's dolphins. But, MFish consider there is little likelihood of an increase in fishing activity as a result of an increase in ELE 5 TACC and, therefore, little likelihood of a change in the level of interactions with marine mammals and seabirds.

40 MFish notes the lack of information pertaining to marine mammal and seabird interactions in the ELE 5 fishery. South East FML is strongly encouraged to complete the video monitoring trials in the ELE 3 area and to implement an appropriate monitoring programme in ELE 5 as soon as practicable. The ELE 5 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

Preliminary Recommendations

41 MFish proposes, under the Adaptive Management Programme, to include a new five-year programme for elephant fish in ELE 5 that will:

a) set the TAC for ELE 5 at 136 tonnes and within this TAC:

   i) allow 5 tonnes for customary fishing;

   ii) allow 5 tonnes for recreational fishing;

   iii) allow 6 tonnes for other sources of fishing-related mortality; and

   iv) increase the TACC from 100 tonnes to 120 tonnes.

b) assign responsibility to the South East Finfish Management Limited to implement an formal log book programme and biological sampling in the FLA 3 bottom trawl fishery to be in place prior to 1 October 2004;

c) assign responsibility to the South East Finfish Management Limited for updating standardised CPUE analysis annually for the ELE 5 fishery of an approved AMP; and

d) assign responsibility to the South East FML to continue to implement measures to mitigate potential impacts for Hector's dolphins and penguins of any ELE 5 TACC increase under this AMP proposal.

ANNEX ONE

Statutory Considerations

42 The purpose of the Act (s 8) is to provide for the utilisation of fisheries resources while ensuring sustainability. Utilisation is defined in the Act as including development. The ELE 5 AMP is intended to provide a structured and monitored way to explore the development opportunities of the fishery, while ensuring sustainability. The increased TAC and TACC will provide for less waste and more economic return from the fishery and create the potential for commercial fishers to provide better for their social, cultural, and economic well being.

43 There should be other economic benefits that extend from the cost-effective gathering of information from the fishery that could result in improved assessments of the ELE 5 stock status relative to the level that would produce the MSY. Improved assessment of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

44 The Act includes obligations to avoid, remedy, or mitigate any adverse effects of fishing on the aquatic environment. Any effects and management measures must be taken into account when decisions are made about the sustainable utilisation of fishery resources. The Act (s 9(a)) requires that associated or dependent species (non-harvested species) should be maintained above a level that ensures their long-term viability.

45 MFish notes that the South East FML AMP proposal is requested to cover existing over-catch in the trawl fishery. Further, ELE 5 is almost wholly a bycatch fishery. Under these circumstances, it is unlikely that, should the proposal proceed, there would be a discernable increase in fishing effort or environmental impact in either the trawl or set-net fisheries.

46 The proposed TAC includes consideration of the following factors:

a) No specific environmental conditions have been identified as affecting the stock; and

b) ELE 5 is largely a bycatch fishery, most notably of the FLA 3 bottom trawl fishery in and around Foveaux Strait, and elephant fish is caught with a range of shallow inshore bottom trawled fish species. There is no information to suggest that the interdependence of stocks should affect the level of the TACC proposed for ELE 5 at this time.

47 There are no known interactions between the existing ELE 5 fishery and non-harvested species that are of concern or specific to the fishery. While partially processed at sea, as a bycatch, the fishery does not generate any significant amount of fish waste or offal at sea, so the potential for interactions with seabirds is not significant. The draft Seabird Interaction with Fisheries in the New Zealand Exclusive Economic Zone - A Review and National Plan of Action 2000 (NPOA) document does not list elephant fish as one of the fisheries with seabird interactions that are of concern.

48 MFish considers that it is unlikely that the proposed increase to the ELE 5 TAC will significantly increase adverse impacts on the threatened Hector's dolphin. The proposed 20% increase to the ELE 5 TACC is to cover current over-catch and, therefore, there is little likelihood of an increase in fishing activity or in the level of interactions with marine mammals and seabirds. South East FML has measures in place (voluntary code of practice) to mitigate and report on impacts on Hector's dolphins. South East FML is also developing an independent monitoring programme based on video observations.

49 MFish notes, however, that there is a lack of information pertaining to marine mammal and seabird interactions in the ELE 5 fishery. South East FML is strongly encouraged to complete the video monitoring trials in the ELE 3 area and to implement an appropriate monitoring programme for ELE 5 as soon as practicable. The ELE 5 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

50 The Act also requires (s 9(b)) that the biological diversity of the aquatic environment should be maintained. There are no known impacts on biodiversity that would be specific to the ELE 5 as a bycatch fishery at current catch levels.

51 Section 9(c) of the Act requires that habitats of particular significance to fisheries management should be protected. MFish notes that the proposed TACC increase is largely intended to cover existing catch and, therefore, the proposal will have no further implications for any habitats of particular significance to fisheries management.

52 Increasing the ELE 5 TACC as proposed will have economic benefits in the short term, but longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater landings, with additional positive downstream implications for the industry possible. A higher TACC for ELE 5 is intended to make it easier for fishers to obtain ACE to cover their bycatch of elephant fish and avoid any incentive to wasteful and uneconomic practices such as discarding.

53 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers that there are no issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 that are not adequately addressed in the management options proposed for ELE 5.

54 Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls for ELE 5 include the following:

- A minimum net mesh size of 150 mm apply in ELE 5 for recreational fishers; and

- Elephant fish has a daily bag limit maximum of 5 per person and is one of the species that is subject to the recreational fishing combined finfish daily bag limit of 30 fish in the Southland Fisheries Management Area.

55 A fishery plan could provide another mechanism through which to explore the potential of the ELE 5 fishery, however, a fishery plan for ELE 5 has not been developed or approved to date.

56 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 this proposal for ELE 5. No decision has been made not to require a service in this fishery.

57 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 ELE 5.

58 There is a single regional council with jurisdictional boundaries covering ELE 5 (Environment Southland). The Proposed Regional Coastal Plan for Southland has been examined and there are no proposed measures that would be affected by the proposed increase in the ELE 5 TACC.

59 The ELE 5 area is covered by one Department of Conservation Conservancy (Southland) which has produced two applicable conservation management strategies; Mainland Southland and Stewart Island. These conservation strategies identify a number of issues. Of significance to the ELE 5 fishery are advocating for the sustainable use of marine fisheries and promoting the protection of significant marine ecosystems from the adverse effects of fishing practices. In particular, the development and implementation of a population management plan for Hector's dolphin is relevant.

60 The proposed TAC/TACC increase under this AMP and the subsequent monitoring is designed to ensure that sustainable use of this resource is achieved, while carefully monitoring for any additional impacts on marine ecosystems or marine mammals. Given the proposal to increase the TACC is to cover existing over-catch of elephant fish bycatch, there is unlikely to be any increased impact on marine mammals or seabirds from an increase in the ELE 5 TACC. Further, in the absence of a completed population management plan for Hector's dolphins, the voluntary code of practice has been adopted by industry to reduce the possibility of dolphin mortalities associated with the commercial fishery. MFish and South East FML are also developing an appropriate programme to monitor the effects of fishing on marine mammals and seabirds in the ELE 5 fishery.

61 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests. There are no closed areas, either existing or proposed, where it would be reasonable to consider that elephant fish might be commercially caught. No restrictions have been placed on fishing in any area within the QMA for recreational interests using the provisions in s 311.

62 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.

63 MFish considers that the information used to evaluate the ELE 5 proposal is the best available. The stock information has been reviewed by the AMP Working Group and by Plenary. While it is recognised that the current status of the stock is uncertain, the monitoring criteria for the proposal will allow for improved information to be obtained. There is little information on marine mammal and seabird interactions with the ELE 5 fishery, and that information is uncertain. MFish does not believe that the uncertainty about the stock status is a reason to prevent the Minister from approving this AMP

ANNEX TWO

Biological Characteristics

64 Elephant fish are uncommon off the North Island, occurring south of East Cape on the east coast and south of Kaipara on the west coast. They are most plentiful around the east coast of the South Island.

65 Males mature at a length of 50 cm fork length (FL) at an age of three years, females at 70 cm FL at four to five years of age. The maximum age cannot be reliably estimated, but appears to be at least 9 years and may be as high as 15 years. The M value of 0.35 used is based on unvalidated ageing work indicating a maximum age of 13 years. This results from use of the equation $M = \log_e 100/\text{maximum age}$, where maximum age is the age to which 1% of the population survives in an unexploited stock.

66 Mature elephant fish migrate to shallow inshore waters in spring and aggregate for mating. Eggs are laid on sand or mud bottoms, often in very shallow areas. They are laid in pairs in large yellow-brown egg cases. The period of incubation is at least five to eight months, and juveniles hatch at a length of about 10 cm FL. Females are known to spawn multiple times per season. After egg laying, the adults appear to disperse and are difficult to catch, however, juveniles remain in shallow waters for up to three years. During this time, juveniles are vulnerable to incidental trawl capture but are of little commercial value.

Catch Information

Commercial fisheries

Table 2: Table 3: **Reported landings (tonnes) and TACCs (tonnes) of elephant fish from ELE 5 from 1986–87 to 2002-03.**

Year	Landings (tonnes)	TACC (tonnes)
1986–87	48	60
1987–88	64	60
1988–89	49	62
1989–90	32	62
1990–91	55	71
1991–92	58	71
1992–93	39	71
1993–94	46	71
1994–95	60	71
1995–96	72	71
1996–97	74	71
1997–98	95	71
1998–99	129	71
1999–00	105	71
2000–01	153	71
2001-02	105	100
2002-03	104	100

Stock Assessment Information

67 Information from the 2003 AMP plenary on ELE 5 is provided below.

Elephant fish (ELE 5)

68 The South East Finfish Management Company (South East FML) proposed a further increase (20%) in the ELE 5 TACC from 100 tonnes to 120t to cover current over-catch on the grounds that ELE 5 is an unavoidable bycatch of the FLA 3 bottom trawl fishery.

Stock assessment criteria

69 Although standardized CPUE has declined in both of the relevant statistical areas (025 and 030) since the 1999-2000 fishing year, it is argued that high deemed values for ELE 5 has resulted in avoidance or discarding and, therefore, a negative bias in CPUE (as an index of abundance). Owing to the low spatial resolution of effort data, the plenary could also not establish the extent to which the increase in ELE5 catch could have been caused by a shift in fisher behaviour. Trawl fisheries mainly targeting flatfish species account for approximately 90% of the annual catch during the current AMP for ELE 5, but have provided no additional information beyond the catch and effort logs required by the Ministry of Fisheries.

70 Given the current circumstances, the plenary concluded that there is no reliable index of abundance for ELE 5.

71 Without an index of abundance, the plenary was not in a position to evaluate:

a) The likelihood that current biomass was above $B_{MSY;}$

b) Whether the proposed TAC would allow the stock to move towards $B_{MSY;}$ and

c) Whether stock abundance had remained stable at current catch levels.

72 It was noted that annual catches of ELE 5 had exceeded 120 tonnes only three times during the last 50 years. However, the current TACC of 100 tonnes has been exceeded in each of the most recent five fishing years.

Monitoring

73 The Plenary agreed that the following monitoring measures would be necessary:

- Trawl by-catch CPUE as a measure of abundance for ELE 5. The industry argue that given the requested increase in TACC, fishers would no longer need to avoid/discard elephant fish and that trawl CPUE would therefore improve as an index of abundance;
- A logbook programme providing high spatial resolution for ELE 5 catch and effort; and
- Biological sampling of the set-net catch is not useful given the small amount taken by that method while sampling the trawl catch, while difficult, would be beneficial.

Decision rule criteria

74 Decision rules are not considered necessary. A full analysis of all information every two to three years is a more effective way to review the performance of the stock.

Environmental considerations.

75 Given that the increase in TACC is requested to cover over-catch in the trawl fishery, no increase in effort or environmental impact is anticipated for either the trawl or the set-net fisheries.

Social, cultural and economic factors

76 Elephant fish (reperepe) is a traditional Ngai Tahu resource as it is easily accessed in the inshore zone, readily caught by traditional fishing methods, and highly prized as a food source.

77 Elephant fish in ELE 5 is an important recreational fishery valued for its cooking and eating qualities.

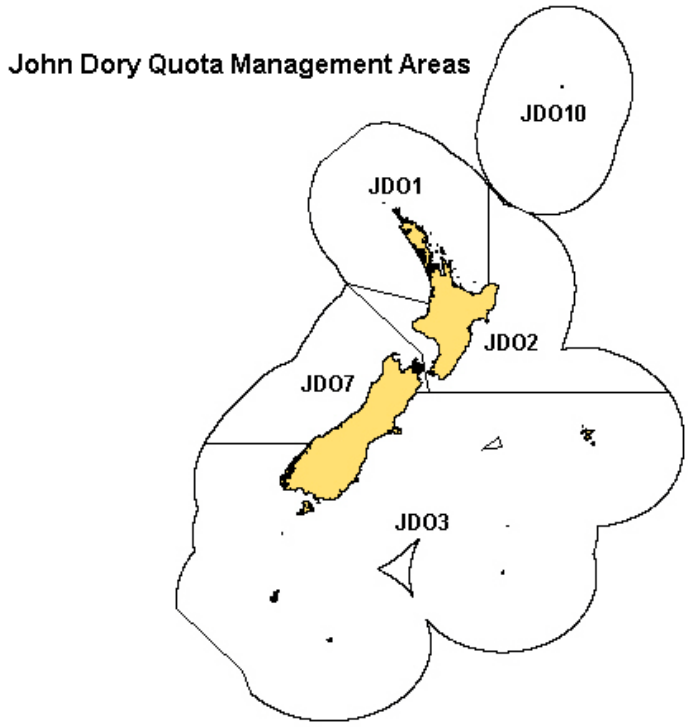
78 ELE 5 quota was being traded at $6 600 per tonne, with ACE currently traded at an average price of $567.70 per tonne as at September 2003. There were 23 quota owners in the ELE 5 fishery, and 35 ACE holders.

79 ELE 5 currently has an interim deemed value of $0.79 per kilogram and an annual deemed value of $1.57 per kilogram. The Port Price as at September 2003 is $2.5028.

Research

80 There is no recent research or future research proposed that is specific to ELE 5.

JOHN DORY 7 (JDO 7) AMP PROPOSAL – INITIAL POSITION PAPER



Key Issues to be Considered

81 The key issues to be considered for the proposed John dory (JDO 7) Adaptive Management Programme (AMP) are:

a) MFish has received a proposal from the Challenger Finfisheries Management Company Limited (Challenger FMC) to increase the Total Allowable Commercial Catch (TACC) by 40% from 91 tonnes to 127 tonnes under a five-year AMP;

b) John dory are primarily taken as a bycatch in the target barracouta and flatfish trawl fisheries. Reported commercial catches have exceeded the TACC in the past three fishing years (ie, 14% in 2000–01, 36% in 2001-02, and 25% in 2002–03);

c) Catches in excess of the TACC are attributed to a recent increase in John dory biomass, and has led to deemed value penalties for some fishers due to insufficient annual catch entitlement (ACE) to balance catches. This has caused some vessels to move away from productive grounds for the target species to avoid catching John dory;

d) It is not known whether JDO 7 is at, above or below the B_{MSY}. But B_{MSY} is not expected to be a stable value in the long-term as environmental factors primarily determine stock abundance. Accordingly, John dory are unlikely to be overfished in JDO 7 even if the TACC remains high when biomass is low;

e) The AMP seeks to address problems in balancing John dory catches by setting a TACC that reflects increasing catch levels. This proposal is made in the context of a supporting draft JDO 7 fishery plan under s 11A of the Fisheries Act 1996;

f) An opportunity exists to use either the AMP or the Low Knowledge Bycatch framework to increase the JDO 7 TACC to reflect current stock levels; and

g) The costs and benefits of the different monitoring programmes proposed under the AMP and Low Knowledge Bycatch framework options need to be assessed to determine the preferred option.

Management Options

82 The proposed management programme, TAC, TACC, and allowances for JDO 7 are presented in Table 1.

Table 1: Proposed management framework, TAC, TACC and allowances (tonnes) for JDO 7

Programme	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC	%TACC increase
AMP	133	1	2	3	127	40%
Low Knowledge Bycatch Stock	120	1	2	3	114	25%

83 The Challenger FMC proposes to establish an AMP for JDO 7 for five years beginning 1 October 2004 that will:

a) Increase the TACC from 91 tonnes to 127 tonnes (40% increase); and

b) Implement a research programme to provide additional stock assessment information to monitor the performance of the fishery under a higher TACC level.

84 An alternative option is to include JDO 7 under the Low Knowledge Bycatch framework. Under this option, the proposed TACC is increased to 114 tonnes (25% increase) but no additional monitoring by commercial fishers is required.

AMP and Low Knowledge TAC and Allowance Options

TAC

85 No TAC has been set for JDO 7 and there are no specific allowances for non-commercial fishing interests. For the purposes of varying a TACC for a quota management stock, the Fisheries Act 1996 (the Act) requires a Total Allowable Catch (TAC) to be set under s 13 or s 14, and that within the TAC, allowances are made for non-commercial fishing interests and other sources of fishing-related mortality.

86 MFish considers it appropriate to set sustainability measures for the JDO 7 fishery under s 13 because the biological characteristics of John dory allow the maximum sustainable yield (MSY) to be estimated, the fishery is not part of any international agreement, and is not managed on a rotational or enhanced basis. Section 13 requires that the stock is maintained at, or moved towards, a level that can produce the MSY.

MFish does not consider that John dory meets the criteria for consideration under the alternative options for setting sustainability measures provided by s 14.

87 There is a lack of information to estimate stock assessment yields and the relationship of biomass to MSY for JDO 7. In the absence of stock assessment information, a proposed TAC for John dory is based on known or estimated levels of recreational, Mäori customary and commercial catches, together with an estimate of all other sources of mortality.

Policy frameworks

88 MFish has considered increasing the TACC for JDO 7 under both the AMP framework and Low Knowledge Bycatch framework. On balance, MFish prefers to increase the TACC under the Low Knowledge Bycatch option to reflect recent catch levels, as there is sufficient justification to increase the TACC based on existing stock assessment information without imposing additional costs of an AMP on industry.

89 Under the Low Knowledge Bycatch framework, the existing fishery-independent abundance index (based on the west coast South Island trawl survey) will continue to monitor stock status. Because MSY is unlikely to be stable in the long term, MFish anticipates that stock levels under the proposed Low Knowledge Bycatch option would remain sustainable over the long-term despite possible short-term fluctuations in biomass. The Low Knowledge Bycatch option imposes a lower risk to sustainability by virtue of a smaller TACC increase. Under this option, catch information for the fishery would be reviewed after three years (2008). While the proposed TACC under the Low Knowledge Bycatch option is lower than the AMP option, it should enable fishers to balance catches at current catch levels.

90 The main benefit of the proposed AMP is the collection of additional stock assessment information to assess stock status. While the Challenger FMC has proposed a research programme to support a higher TACC, it is uncertain whether the programme would provide useful alternative fishery-dependent information in which to assess the stock.

91 Declining the proposed AMP may create disincentives for industry to progress and implement a fisheries plan for the GUR 7 fishery. MFish supports the use of fisheries to facilitate a greater stakeholder role in the management of fisheries and invites industry to comment on the merits of increasing the TACC under an AMP given the additional costs on industry.

Characteristics of JDO 7 fishery

92 JDO 7 is a valuable commercial species and is primarily taken as bycatch in the inshore bottom trawl fishery when targeting barracouta and flatfish. It is generally not targeted as it rarely aggregates in sufficient concentrations. Until 1999–00, catches have remained fairly stable and were less than the TACC of 91 tonnes. In the last three fishing years (2000–01, 2001–02, and 2002–03) catches have exceeded the TACC by 14%, 36% and 25%, respectively (refer to Table 2).

Table 2: JDO 7 landings (tonnes) and TACCs (tonnes) since the 1983–84 fishing year

Fishing Year	Landings	TACC	Fishing Year	Landings	TACC
1983-84*	35	–	1993-94†	37	91
1984-85*	36	–	1994-95†	30	91
1985-86*	45	–	1995-96†	42	91
1986-87†	57	70	1996-97†	35	91
1987-88†	89	75	1997-98†	26	91
1988-89†	47	82	1998-99†	34	91
1989-90†	54	88	1999-00†	71	91
1990-91†	53	88	2000-01†	104	91
1991-92†	60	88	2001-02†	124	91
1992-93†	50	91	2002-03†	114	91

* FSU data.
† QMS data.

93 The recent overcatch of John dory is believed to be directly attributable to a large increase in biomass during the past three to four years. Anecdotal information suggests the current high biomass is associated with an exceptionally large year class from the late 1990s, together with possible immigration of individuals from the JDO 2 fishery into northern parts of the South Island. An increase in biomass is supported by significant increases in CPUE in the target barracouta and flatfish fisheries, as well as anecdotal information from fishers of an increase in spatial catches.

94 The 2003 Plenary considers that MSY is unlikely to be stable in the long-term because of the large influence of environmental factors (such as water temperature) on stock abundance. John dory in the JDO 7 fishery is at its southernmost distributional limit and may in fact be part of the northern JDO 2 stock. As such, recruitment into the JDO 7 fishery is primarily determined by environmental factors, and this would cause biomass to fluctuate over time. These fluctuations would be augmented by possible immigration of individuals from the JDO 2 stock moving into more southern areas. Accordingly, biomass is expected to increase when environmental conditions are favourable, and decrease when unfavourable. The fluctuations in John dory biomass would cause the MSY for JDO 7 to vary from year to year.

Rationale for TAC/TACC increase

95 The disparity between the TACC and current catch levels is having a negative economic effect on the industry. Fishers are having to pay deemed value[1] penalties for catches in excess of ACE holdings, and is forcing some fishers to move away from productive areas for the target species in an attempt to avoid catching John dory. As such, the TACC constrains fishers who hold insufficient JDO 7 ACE from efficiently harvesting the associated target fisheries. In addition, the TACC prevents fishers from taking advantage of the recent increase in John dory biomass.

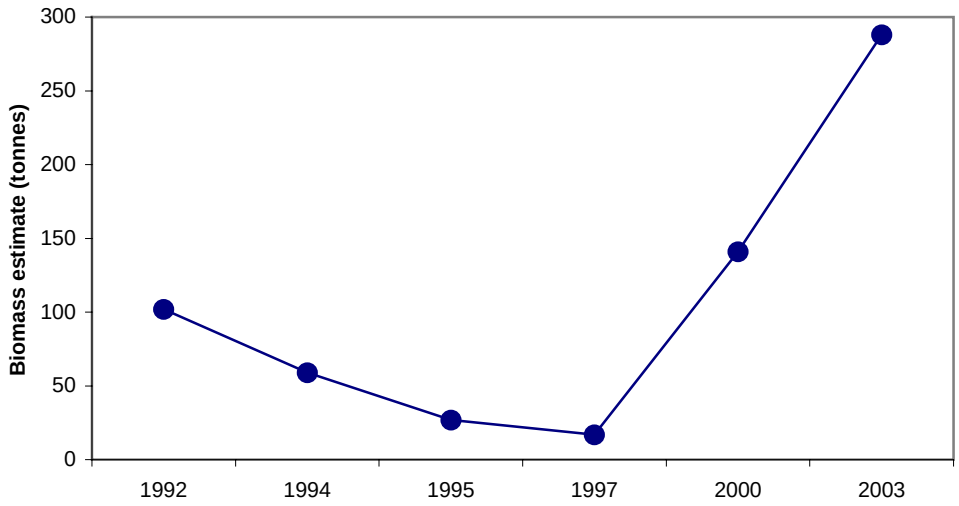
96 The performance of the JDO 7 fishery is largely monitored using the west coast South Island trawl survey programme (by the *RV Kaharoa*). There have been six surveys since 1992 and these provide a fisheries-independent method of measuring relative abundance of John dory over time. While the survey is designed to target giant stargazer, red cod, red gurnard and tarakihi, the survey area encompasses areas where John dory are caught. The relatively low coefficient of variation (c.v.) associated with

[1] JDO 7 has an Interim Deemed Value of $1.59/kg and an Annual Deemed Value of $3.17/kg. The current port price for JDO 7 is $3.90/kg.

the trawl index (19%-36%) suggests the trawl survey provides an effective method to monitor stock status. The next trawl survey is planned for early 2005.

97 The recent increase in John dory biomass is supported by the 2003 west coast South Island trawl survey indice. The overall biomass index steadily declined between 1992 and 1997, but demonstrated a dramatic increase in 2000, and an even more substantial increase to a historical maximum in 2003 (refer Figure 1). An increase in biomass in 2003 was observed in all trawl strata, but particularly in the northern inshore areas around Golden and Tasman Bays.

Figure 1 **Overall biomass estimates (tonnes) for John dory from the west coast South Island trawl series**



98 The Plenary noted the recent increase in commercial landings, together with a significant increase in the 2000 and 2003 west coast trawl survey indices, suggests that JDO 7 biomass is currently high. Current catches are considered to be sustainable despite exceeding the TACC over the past three fishing years.

99 The biological characteristics of the JDO 7 stock reduces the risk to overfishing under the proposed TAC and TACC options as environmental factors primarily drive stock levels rather than the effects of fishing. As the stock will fluctuate over time in response to variations in environmental conditions, it is unlikely that fishing will compromise the sustainability of the fishery even when biomass is low. Furthermore, overfishing is further mitigated as fishers are generally unable to target John dory when biomass is high.

Impact on interests of one or more fishing sectors

100 MFish acknowledges there is potential for increased commercial catches under a higher TACC to affect the size and availability of John dory for non-commercial fishers. The nature and extent of any effect would depend on the (unknown) current status of the stock. However, it is unlikely that either TACC option would cause any undue effect on the non-commercial fishery as commercial catch levels equivalent to the proposed TACCs have already been taken in the past two to three years and recreational fishers have not raised any concerns about their ability to catch John dory. The natural fluctuations in John dory biomass overtime are more likely to influence non-commercial catches of John dory, rather than the effects of commercial fishing.

Recreational allowance

101 Anecdotal information suggests that John dory are taken by recreational fishers as bycatch in the snapper and tarakihi target fisheries in Golden and Tasman Bays. The main methods of catching John dory are handlining and set netting.

102 The 1999–00 National Marine Recreational Fishing Survey provides an estimate of annual recreational harvest of JDO 7 of up to two tonnes (range: 0-1.9 tonnes). However, this estimate should be treated with caution as it is based on 'one fisher', and incorporates a very large c.v. of 102%. Nevertheless, MFish considers an annual recreational harvest of about two tonnes is realistic given the likelihood that recreational catches of John dory have increased in response to the recent increase in biomass, as well as reflecting a general increase in recreational fishing effort within the top of the South Island. In addition, recent restrictions to the local blue cod fishery may cause recreational fishers to target other fish species such as John dory, which is considered to be a prime eating fish.

103 While considering the allowance for recreational interests, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made pursuant to s 311 of the Act (s 21(5)). No such regulations have been made.

104 MFish considers that in the absence of any alternative information, the 1999–00 National Marine Recreational Fishing Survey provides the best estimate of recreational harvest in the JDO 7 fishery. In setting a TAC, MFish proposes to include an allowance of 2 tonnes for this stock for recreational interests.

Customary Mäori allowance

105 In considering the proposed allowance for customary non-commercial interests, the Minister is required to take into account any mätaitai reserve or s 186A closure in the relevant QMA (s 21(4) of the Act). No such management measures are in place within the JDO 7 fishery.

106 John dory are considered to be of low-medium importance to Mäori and there is no known level of customary catch. MFish considers it appropriate to set an allowance for customary interests based on 50% of the proposed recreational allowance. In setting a TAC for JDO 7, MFish proposes to include an allowance of 1 tonne for customary interests.

Other sources of mortality

107 No quantitative information is available on the level of illegal catch or other sources of mortality. It is possible that John dory are discarded by some commercial fishers who do not hold sufficient ACE to cover bycatch to avoid deemed value penalties. It is also likely that some indirect fishing-mortality will occur through the escapement of fish from nets.

108 MFish considers it appropriate to include an allowance for other sources of fishing-related mortality for JDO 7 based on 2% of the TACC. In setting a TAC, MFish proposes to include an allowance of 3 tonnes for other sources of fishing-related mortality.

TACC

AMP option

109 The Challenger FMC has proposed to increase the TACC to 127 tonnes under the AMP framework. The proposed AMP incorporates a supporting research programme to provide additional stock assessment information to monitor stock status under a higher commercial catch level. The main objective of the AMP is to determine the size, geographical extent, and long-term sustainable yield of the JDO 7 stock. The effect of the proposed TACC is the generation of additional ACE to enable fishers to balance John dory catches.

110 MFish considers the JDO 7 fishery meets the requirements for inclusion under the AMP framework. MFish does not anticipate the proposed TACC level, supported by additional monitoring and reporting arrangements, would lead to any sustainability concerns for the JDO 7 fishery. The proposed TACC is slightly higher than current catch levels within the commercial fishery and would primarily be used by existing fishers to balance catches. The proposed TACC is unlikely to lead to any substantial development of a target John dory fishery or cause fishing effort to redistribute into new areas. MFish notes the risks to the sustainability of the fishery under the proposed TACC are reduced as environmental factors rather than the effects of fishing largely drive stock levels. The 2003 Plenary has no concerns regarding the extent of the proposed TACC increase under the proposed AMP.

111 However, the value of the proposed research programme to provide additional stock assessment information is uncertain. Presently, the fishery is monitored by the west coast South Island trawl survey, which appears to provide a good indicator of stock status. Because the JDO 7 fishery is primarily a bycatch fishery, catch rates of John dory are expected to be influenced by spatial and temporal changes in the associated target fisheries. Catch rates will also be influenced by fluctuations in John dory biomass caused by variations in environmental conditions and possible immigration of fish from the JDO 2 fishery. As such, the use of commercial catch and effort data may therefore not provide a reliable indicator of current John dory biomass or monitor changes in relative abundance in response to higher catch levels. While the proposed monitoring and reporting arrangements would increase stock assessment information on the fishery, it is uncertain whether these arrangements would provide useful alternative fishery-dependent information in which to assess stock status.

112 Increasing the JDO 7 TACC would have economic benefits in the short term. The port price is $3 900 per tonne, therefore a 36 tonne increase in the TACC has a domestic gross value of $140 400. Export values would increase the value of the fishery. Longer-term benefits would be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

113 MFish notes the TAC and TACC levels can be revised appropriately if there is information to suggest that catches under the proposed AMP are having an adverse effect on the sustainability of the fishery.

Monitoring

114 The proposed AMP intends to provide additional stock assessment information to assess the performance of the fishery under a higher commercial catch level. Specifically, the research programme will include:

a) New CPUE indices from the BAR 7 and FLA 7 target fisheries. MFish catch and effort data will be supplemented by more detailed information collected through a voluntary logbook programme in the QMA bottom trawl fishery. The proposed logbook programme will be the same as the guidelines already specified by the Challenger FMC for current AMP fisheries; and

b) The continued use of biological data collected from the existing trawl survey and shed sampling programmes. Commercial fishers will randomly tag and release some fish to collect supplementary biological information.

115 The Challenger FMC contends it has sufficient mandate to ensure fishers comply with the requirements of the proposed AMP. It notes that it represents 76% of all JDO 7 quota shares, and is currently responsible for several existing AMPs including stargazer (STA 7), rig (SPO 7), and bluenose (BNS 7 and 8).

116 The 2003 Plenary supports the proposed monitoring arrangements for assessing the JDO 7 fishery. The Plenary regards decision rules for the proposed AMP are unnecessary on the grounds that a full analysis of all information every two to three years is a more effective way to review the performance of the stock. According, the proposed AMP does not include a decision rule at this time. Instead, the Challenger FMC would monitor the AMP on an annual basis and fully report back to the Plenary in 2007 and at the completion of the AMP in 2010.

117 MFish considers the proposed logbook and monitoring arrangements are key elements of the proposed AMP. MFish notes there have been past problems with the level of logbook participation in some AMP fisheries, and is reluctant to consider a TACC increase under the proposed AMP unless there is a formal commitment by JDO 7 fishers to the logbook and monitoring programme before 1 October 2004. It is considered that at least 50% of ACE holders in JDO 7 will need to need to participate to provide adequate coverage.

118 Under the AMP option, MFish would require the Challenger FMC to undertake the following measures to monitor the JDO 7 fishery, by:

a) Obtaining a commitment from at least 50% of ACE holders to participate in the logbook and monitoring components of the AMP before 1 October 2004;

b) Providing annual updates to MFish on the compliance of keeping logbooks, collection of biological information, and monitoring of fishing-related mortality; and

c) Providing full reports to the AMP Working Group and Plenary in 2007 and 2010 on standardised CPUE analysis for the JDO 7 fishery, biological information, and monitoring of fishing-related mortality.

Low knowledge bycatch framework option:

119 The JDO 7 fishery also meets the requirements for inclusion under the Low Knowledge Bycatch framework. Specifically, the stock satisfies the following five criteria for a TACC adjustment:

- The fishery is primarily a bycatch fishery of the barracouta and flatfish fisheries;
- There is no stock assessment information to determine an appropriate sustainable yield;
- There are no known sustainability concerns concerning the JDO 7 stock under current catch levels;
- Catch has exceed the TACC by 20% in two of the past three fishing years – 14% in 2000–01, 36% in 2001–02, and 25% in 2002–03; and
- There has been no TACC increase for at least three years (last increase occurred in 1991–92).

120 Under the Low Knowledge Bycatch option, the proposed TAC is largely based on the TACC. The proposed TAC incorporates the same allowances for non-commercial interests and other sources of fishing-related mortality as proposed under the AMP option. The proposed TACC would be set under s 13 of the Act.

121 MFish considers the TACC under the Low Knowledge Bycatch framework should be based on average commercial catches over the past three fishing years (ie, 2000-01 to 2002-03). This reflects the period when catches exceeded the current TACC in response to an increase in John dory abundance. Under this approach, the proposed TACC would be increased from 91 tonnes to 114 tonnes (25% increase), which is the same as the total commercial catch in the last fishing year (2003–04). Accordingly, a TAC would be set at 120 tonnes.

122 A TACC increase under the Low Knowledge Bycatch option is 23 tonnes (ie, 25% increase) and is less than the proposed AMP approach (36 tonnes or 40% increase). As discussed above, the risk to the sustainability of the stock under the proposed TACC is mitigated in light of the current views on this fishery that environmental factors play a greater role on influencing stock levels than the effects of fishing.

123 The main beneficial effect of the proposed TACC is the generation of additional ACE enabling commercial fishers to balance a greater quantity of John dory. This would have a positive effect on the commercial sector by reducing impacts on the associated target fisheries and allowing greater utilisation of the John dory resource. However, it is possible that in some years John dory catches may exceed the proposed TACC if

biomass continue to increase. This would require some fishers to continue to either modify their fishing activities to avoid John dory bycatch or pay deemed value penalties.

124 The main negative effect of adopting the Low Knowledge Bycatch option is the loss of additional stock assessment information to assess the performance of the fishery under a higher TACC. However, as noted above, it is unclear whether the additional information under the proposed AMP would provide a satisfactory alternative means to monitor stock status. While the industry is encouraged to implement the proposed research programme to improve the knowledge of this fishery, there would be no obligation for this programme to proceed under the Low Knowledge Bycatch framework. Given the additional costs to collect and analyse the proposed additional CPUE and biological information, the industry may not proceed with the proposed research programme.

125 Under the Low Knowledge Bycatch option, the fishery would be reviewed after three years (2008). This approach would ensure that catch levels remain sustainable.

Analysis of options

126 It is clear that the TACC for JDO 7 is constraining the economic benefits of the recent increase in John dory biomass in two ways. Firstly, the TACC is impacting on the efficient utilisation of the associated target fishers, as fishers attempt to modify their fishing activities to reduce or avoid catching John dory. Secondly, fishers are unable to take advantage of increased John dory biomass as deem value penalties are reducing the economic return from the fishery.

127 The proposed AMP seeks to address these problems by increasing the TACC to 127 tonnes to reflect current catch levels. The benefits of the proposed TACC is to generate sufficient ACE to enable fishers to balance catches, while the supporting research programme may collect additional stock assessment information to assess the performance of the fishery under a higher commercial catch level. The value of this additional information is uncertain at this time. A higher TACC under this option may provide limited developmental opportunity in some years as fishers explore ways to target John dory to fully utilise ACE holdings. However, increasing the TACC under the AMP framework would impose additional costs on the industry to implement and support the associated research programme.

128 The proposed TACC of 114 tonnes under the Low Knowledge Bycatch option would enable fishers to balance catches at current catch levels. However, if biomass continues to increase, the lower TACC option may constrain catch levels in some years. Under this option, there is unlikely to be any developmental potential as fishers would fully utilise the TACC to cover catches. The Low Knowledge Bycatch option imposes a lower risk to the sustainability of the stock by virtue of a smaller TACC increase. The costs on industry under this option would be less than the proposed AMP, as there is no obligation on fishers to particulate in a supporting research programme.

129 Given the 2003 Plenary's views, MFish supports a TACC increase under the Low Knowledge Bycatch framework, as there is sufficient stock assessment information to justify an increase in TACC to existing commercial catch levels. Increasing the TACC under this option is appropriate as it meets the purpose of the Act to provide

for the efficient utilisation of the John dory resource and the associated target fisheries. The approach would enable fishers to balance catches at current catch levels without imposing unnecessary costs on the industry to participate in a supporting research programme.

130 Increasing the TACC under the Low Knowledge Bycatch option may create disincentives for industry to progress and implement a fisheries plan for the JDO 7 fishery. The Challenger FMC is presently developing a fisheries plan to support the proposed AMP on behalf of JDO 7 quota owners. The objective of the plan is to maintain and improve quota value, as well as the future of the fishery, in the broader environmental and management environment. The plan proposes a number of measures to ensure the sustainability of the stock, including the use of remedial actions if fishing is demonstrated to be having an adverse impact on the JDO 7 fishery, associated bycatch fisheries, or associated or dependent species. MFish encourages the industry to develop a fisheries plan under the Low Knowledge Bycatch framework to achieve the longer-term benefits of greater stakeholder management of the fishery.

Future Management

131 The proposed AMP for JDO 7 would run for five-years (beginning 1 October 2004). The Challenger FMC would monitor the fishery each year and report back to the Plenary in March 2007 and 2010. Depending on the information obtained, it may be possible to undertake a formal stock assessment of JDO 7. Under the Low Knowledge Bycatch option, a review of the performance of the fishery would be conducted in 2008. A summary of proposed management actions under the proposed AMP and Low Knowledge Bycatch options are shown in Table 3.

Table 3: Proposed management actions under the AMP and Low Knowledge Bycatch Table 4: frameworks

	Initial assessment	Monitoring	Program review	Trigger points	Outcome
AMP	• March 2007	• Existing CPUE indices • New CPUE indices for the target BAR 7 and FLA 7 fisheries • Existing west coast South Island trawl index • New voluntary logbook programme • Random at-sea tagging programme	• March 2010	• No decision rule proposed	• Stock assessment
LK		• Existing CPUE indices • Existing west coast South Island trawl index	• 2008	• No decision rule proposed	• No Stock Assessment possible • Catch records

132 MFish will be undertaking further surveys to determine levels of recreational catch (including JDO 7), and estimates of customary Mäori catch may become available from reporting under the Fisheries (South Island Customary Fishing) Regulations 1998.

Conclusion

133 The Challenger FMC has proposed that the TACC for JDO 7 be increased from 91 tonnes to 127 tonnes under a five-year AMP. The proposed AMP is made in the context of a supporting draft JDO 7 fishery plan under s 11A of the Act.

134 The 2003 Plenary considers MSY is unlikely to be stable in the long-term given the influence of environmental factors on JDO 7 stock levels. Accordingly, the stock is unlikely to be overfished even if the TACC remains high when biomass is low. Both the west coast South Island trawl survey index and commercial catch and effort information indicate that the JDO 7 biomass is currently high.

135 The proposed AMP seeks to address a management problem in response to the recent increase in John dory biomass. The AMP would provide information to determine the size, geographical extent, and long-term sustainable yield of the JDO 7 stock. The effectiveness of the proposed research programme to monitor the fishery under a higher catch level is uncertain. As the proposed TACC incorporates current catch levels, it is unlikely that a significant target John dory fishery would develop, or result in the expansion of fishing effort into new areas. It is not anticipated the proposed TACC would impose additional risks to the sustainability of the fishery given the biological characteristics of the stock.

136 JDO 7 also meets the criteria for consideration under the Low Knowledge Bycatch framework. Under this option, a TACC of 114 tonnes is proposed and is based on average catches over the past three years. This approach would enable fishers to balance catches under current catch levels and impose lower costs on industry as there is no obligation for commercial fishers to implement the proposed research programme. If biomass continues to increase, the lower TACC option may constrain catch levels in some years and again present fishers with problems in balancing catches. It is not anticipated that the proposed TACC would impose additional risks to the sustainability of the fishery.

137 MFish supports increasing the TACC to 114 tonnes under the Low Knowledge Bycatch option to enable fishers balance catches at current catch levels. This approach is appropriate as there is sufficient stock assessment information to justify an increase in TACC without imposing unnecessary costs on the industry to implement an AMP. The proposed TACC meets the purpose of the Act to provide for the sustainable utilisation of both the John dory resource and the associated target fisheries.

138 No specific concerns have been identified regarding associated or dependent species, and standard requirements are in place to report interactions with seabirds and marine mammals.

139 The relevant statutory considerations have been taken into account in determining the proposed management options for JDO 7 (refer to Annex 2).

Preliminary Recommendations

140 MFish proposes to include JDO 7 under the Low Knowledge Bycatch framework that will:

a) set the TAC at 120 tonnes;

b) make an allowance of 1 tonne for customary Mäori interests, 2 tonnes for recreational interests, and 3 tonnes for other sources of fishing-related mortality;

c) increase the TACC by 25% from 91 tonnes to 114 tonnes; and

d) review the performance of the fishery under the proposed TAC in 2008.

ANNEX ONE

Biological Characteristics

141 John dory is a common inshore coastal species found predominately in northern New Zealand. The species also occurs around the lower North Island, and as far south as Golden and Tasman Bays. John dory is not known to form large shoals, but is usually found individually or in small groups. It is found to depths of 400 m, but is most common at depths of less than 200 m.

142 John dory is a serial spawner (spawning more than once in a season). There appears to be substantial variation in the time of spawning throughout New Zealand, with spawning occurring between December and April on the northern coast. The eggs are large and pelagic, taking 12-14 days to hatch.

143 Growth is initially rapid with both males and females reaching 12-18 cm in length after the first year. From the second year, females grow faster than males and reach a greater maximum length. Females mature at a size of about 29-35 cm, and in general, larger females mature earlier in the season and are more fecund. Males mature at about 23-29 cm.

144 It is believed that John dory live to about 12 years of age.

Catch Information

Commercial fisheries

145 John dory is mainly taken as a bycatch of the trawl and Danish seine fisheries. In recent years, about 80% of the total national reported catch has been taken from the JDO 1 fishery, with around 16% taken from the JDO 2 fishery.

146 The JDO 7 fishery is primarily a bycatch in the inshore bottom trawl fishery when targeting barracouta and flatfish. The Golden and Tasman Bays region generally accounts for 25-60% of the total annual catch, whilst the reminder of the catch is taken from around Farewell Spit and Cook Strait. Catches generally decrease further offshore and down the west coast of the South Island.

147 John dory is generally caught year round, with lower catch rates during the winter and higher catch rates during spring.

148 Until 1999–00 catches remained fairly stable and were less than the TACC of 91 tonnes. Catches exceeded the TACC in the last three fishing years by 14%, 36% and 25%, respectively.

149 The recent increase in John dory catches have occurred mainly in the associated target barracouta and flatfish fisheries. Target catches of John dory have remained largely unchanged (Table 1).

Table 4: CELR catches (tonnes) of John dory from JDO 7 by target species and fishing year.

Fishing Year	JDO	BAR	FLA	JMA	TAR	GUR	Other Species
1990/91	1.1	9.3	6.1	7.1	0.7	1	5.1
1991/92	0.6	16.6	2.6	7.9	0.2	0.5	5.2
1992/93	0.1	10	1.6	9.2	<0.1	0.2	4.6
1993/94		3.8	2.5	5.1	0.9	0.2	0.9
1994/95		5.4	1.1		0.3	<0.1	2.6
1995/96		3.1	1.6	5.9	0.1	0.1	1.4
1996/97		5	3.7	1.5	0.7	1	2
1997/98		2.2	5.1	1.5	0.5	<0.1	2.2
1998/99	0.6	7.7	4	3.6	3	0.2	3.5
1999/00	5.2	13	14.3	0.3	11.7	2.1	5.7
2000/01	2.2	32.3	16.6	1.5	9.9	5.3	6
2001/02	2.2	35.2	22.1	9.6	6.1	3.9	8.7
2002/03	0.5	25.8	20.8	1.6	12.3	7.3	7.3

1. Data for 2002/03 are incomplete (to 3rd June 2003)

150 JDO 7 quota is trading at $5 014 per tonne (as at 30 September 2003), with ACE traded at $2 267 per tonne. There are presently 26 quota owners in the fishery, and 62 ACE holders, with ACE holdings ranging up to 8 tonnes.

Customary Mäori

151 John dory are not considered to be an important species for customary fishers. However, it is likely that John dory will be taken for customary purposes when caught as a bycatch of other target species.

152 No quantitative information is available on the current level of Mäori customary take.

Recreational fisheries

153 John dory are taken by recreational fishers as a bycatch in the snapper and tarakihi target fisheries in Golden and Tasman Bays. The main methods of catching John dory are handlining and set netting.

154 The 1999–00 National Marine Recreational Fishing Survey provides an estimate of annual recreational harvest of JDO 7 of up to two tonnes (range: 0-1.9 tonnes). This estimate should be treated with caution as it is based on 'one fisher', and incorporates a very large coefficient of variation (c.v.) of 102%.

Other sources of fishing-related mortality

155 It is possible that some John dory are discarded by commercial fishers who do not hold sufficient ACE to avoid deemed value penalties. It is also likely that some indirect fishing-mortality will occur through the escapement of fish from nets.

156 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality.

ANNEX TWO

Statutory Considerations

157 In forming management options the following statutory considerations have been taken into account:

TAC

158 The purpose of the Act (as provided in s 8) is to provide for utilisation of fisheries resources while ensuring sustainability. The proposed AMP for JDO 7 seeks to address a management problem by setting a TACC to reflect increasing current catch levels. The current TACC presently inhibits the efficient utilisation of the JDO 7 resource and the associated bycatch fisheries. The proposed AMP is supported by a research programme to assist in monitoring stock status under a higher TACC (including development of new stock abundance indices) and may provide additional stock assessment information. A TACC increase under the AMP and Low Knowledge Bycatch frameworks is consistent with the purpose of the Act to provide for better utilisation of the fishery in light of increased biomass, while ensuring catch levels remain sustainable. As such, the proposed TAC, TACC, and allowances would enable people to provide better for their social, cultural and economic well-being;

159 The TAC set under s 13(2) of the Act should be set at a level that moves the stock towards a level that can produce the MSY. That level is currently unknown for JDO 7 and the 2003 Plenary agreed the MSY is likely to be unstable in the long-term because of the large environmental influence on stock abundance. As such, it may be difficult to assess the fishery in relation to MSY at any one time. Nevertheless, the Plenary also agreed the stock is unlikely to be overfished under a higher TACC even if biomass is low because John dory is at its southernmost limit of its distribution and is a non-aggregating bycatch species. The available information suggests biomass is currently high. The proposed TACC under the Low Knowledge Bycatch framework is based on catch levels over the past three fishing years and MFish is not aware of any sustainability concerns about these levels. The stock would be reviewed in 2008. Under the proposed AMP, annual monitoring and review would reduce the risk to sustainability under the proposed increased catch levels;

Environmental

160 The proposed TAC options are also based on:

a) No specific environmental conditions affecting the stock have been identified (as required to be considered under s 13(2)(b)(ii)). John dory are found in inshore coastal areas and may be vulnerable to the effects of fishing. Growth, morphometrics, and recruitment may vary within and between areas and are likely to be influenced by environmental factors such as water temperature;

b) Biological characteristics of the stock have been considered in setting the proposed TAC (as required to be considered under s 13(2)(b)(ii)). The 2003 Plenary also considered these characteristics in agreeing that while the MSY is

likely to be unstable, the stock is unlikely to be overfished if biomass is low; and

c) A range of important inshore species is associated with John dory due to the use of bottom trawl nets for commercial harvesting. The four most significant commercial species associated with JDO 7 catches are barracouta, flatfish, jack mackeral and tarakihi, all of which are managed under the QMS. There is no information to suggest that the interdependence of stocks should affect the level of the TAC set for JDO 7 at this time.

161 There is no information regarding the natural variability of the JDO 7 fishery. However, the fishery may exhibit some variability as stock levels are influenced by environmental factors.

162 Section 9(a) requires the maintenance of associated or dependent species above a level that ensures their long-term viability. John dory live in close proximity to a variety of other inshore coastal species. Other than as juveniles (when they will be prey to predatory fish), John dory probably have no direct relationship with other fish species. As the proposed TAC options are unlikely to increase the spread of fishing activity to previously unfished areas, it is unlikely there would be a significant increase in the adverse effects on associated or dependent species. Seabirds may occasionally interact with the associated bycatch fisheries. Where John dory are occasionally taken in the hoki fishery (which is classified as a known seabird interaction fishery under the MFish and Department of Conservation National Plan of Action for seabirds), then appropriate measures and codes would be taken. The Challenger FMC intends to monitor the status between seabird interactions in the barracouta and flatfish fisheries. Fur seals and Hector's dolphins are resident in Golden and Tasman Bays, and along the west coast. Measures are currently in place to minimise the interaction between these species and the trawl fisheries. This includes ensuring marine mammals are not around nets when hauling and not returning offal to the sea during these times.

163 Section 9(b) requires the maintenance of biological diversity to be taken into account. John dory are primarily caught as a bycatch in the bottom trawl fisheries. This method can potentially impact on species diversity by indiscriminately catching a wide range of inshore species, including protected marine mammals. As noted above, the proposed TAC options would primarily be used to balance existing overcatch in the associated target trawl fisheries. No increase of effort in new fishing areas is anticipated. It is not expected the proposed TAC options would have any additional impact on biological diversity. Reporting of bycatch (including of any protected species) would allow for information to be collected to advance knowledge of potential impacts.

164 Section 9(c) requires consideration of protection of habitats of particular significance to fisheries management. No habitats of particular significance to fisheries management are associated with the JDO 7 fishery. MFish is not aware of any significant environmental issues associated with the fishery. As noted above, the effects of the proposed TAC options on the aquatic environment are likely to remain unchanged given the bycatch nature of the fishery and the likelihood that fishing would continue to be focused in existing areas.

Allocation

165 The nature of the fishery and interests of customary and recreational fishers have been considered in setting the proposed TAC options. No mātaitai exists in the JDO 7 QMA, nor has an area been closed or fishing method restricted for customary fishing purposes in the QMA. No restrictions have been placed on fishing in any area within the QMA for recreational interests.

166 Section 13(3) requires consideration of relevant social, cultural and economic factors when determining the way and rate in which a stock is moved towards or above MSY. There would be positive economic effects associated with an increase to the TACC, however, the precise nature of these effects cannot be readily quantified. The most obvious effect would be on the associated bycatch fisheries and the improved ability for commercial fishers to balance John dory catch with ACE. The proposed TAC options attempt to balance the adverse effects of fishing on John dory while maintaining catches at current levels.

Miscellaneous

167 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks, and the maintenance of biodiversity). There are no international obligations specific to John dory. MFish considers issues arising under the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for John dory.

168 Section 11(1)(b) provides that the Minister must take into account existing controls when setting or varying a sustainability measure such as a TAC. While no minimum legal size applies to commercial and recreational sectors, a minimum net mesh size of 100 mm applies to both sectors. John dory are also one of the species that is subject to the amateur combined finfish daily bag limit of 20 fish in the Challenger Fishery Management Area.

169 Section 11(2A)(b) requires the Minister to take into account any relevant fisheries plan before setting or varying any sustainability measure. The Challenger FMC is presently developing a JDO 7 fisheries plan to support the proposed AMP. This plan is developed on behalf of JDO 7 quota owners as a "commitment towards maintaining and improving their aggregate quota value and the future of their fisheries in the broader environmental and management environment". The plan has two broad objectives. Firstly, to "commercially harvest the stock at a rate that returns the greatest benefit to JDO 7 quota owners over time". Secondly, "to avoid, remedy and mitigate any adverse effects of commercial harvesting of JDO 7 to the aquatic environment". The plan proposes a commitment to a number of measures including increased monitoring of commercial catches, and the use of a "points of concern process" to ensure the sustainability of the stock. This process would require the Challenger FMC to take remedial actions if fishing is demonstrated to be having an adverse impact on the JDO 7 fishery, associated bycatch fisheries, and associated or dependent species. The first strategy proposed to achieve the objectives of the fisheries plan is to operate the fishery under an AMP.

170 MFish is not aware of any considerations in any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991, or any

management strategy or plan under the Conservation Act 1987, that are relevant to setting a TAC for the JDO 7 at this time.

171 The best available information on the status of JDO 7 is derived from the report from the Fishery Assessment Plenary, May 2003: stock assessments and yield estimates, the minutes of the 2003 Adaptive Management Programme Plenary, and information from the Challenger FMC regarding the proposed JDO 7 AMP. There is no other stock assessment information on this species, other than generalised descriptions of biology and distribution. The absence of information is not a reason for failing to provide for utilisation at levels considered to be sustainable. In accordance with s 10 of the Fisheries Act, the absence of, or uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

ANNEX THREE

Stock Assessment Information

172 The AMP Plenary in December 2003 evaluated the stock assessment criteria and monitoring programme of the proposed JDO 7 AMP as part of the review required for proposed AMP fishstocks. The Plenary 2003 made the following statements regarding the AMP stock assessment criteria for the JDO 7 fishery.

Stock assessment criteria

173 The Plenary made the following conclusions regarding JDO 7:

- Given the large influence of the environment on the abundance of JDO 7, B_{MSY} is not expected to be a stable value;
- Because John Dory are a non-aggregating by-catch species, it is unlikely to be overfished in JDO 7 even if the TACC remained high when biomass was low; and
- Both FMA 7 trawl surveys and commercial CPUE indicate that JDO 7 biomass is currently high.

Monitoring criteria

174 The Plenary agreed that the following monitoring measures would be necessary:

- The use of commercial CPUE and FMA 7 trawl surveys to estimate abundance of JDO 7;
- The implementation of a voluntary logbook programme to provide more detailed information on the QMA 7 trawl fishery; and
- Collection of biological information (e.g. length, sex, otoliths) both by the industry and during FMA 7 trawl surveys.

Decision-rule criteria

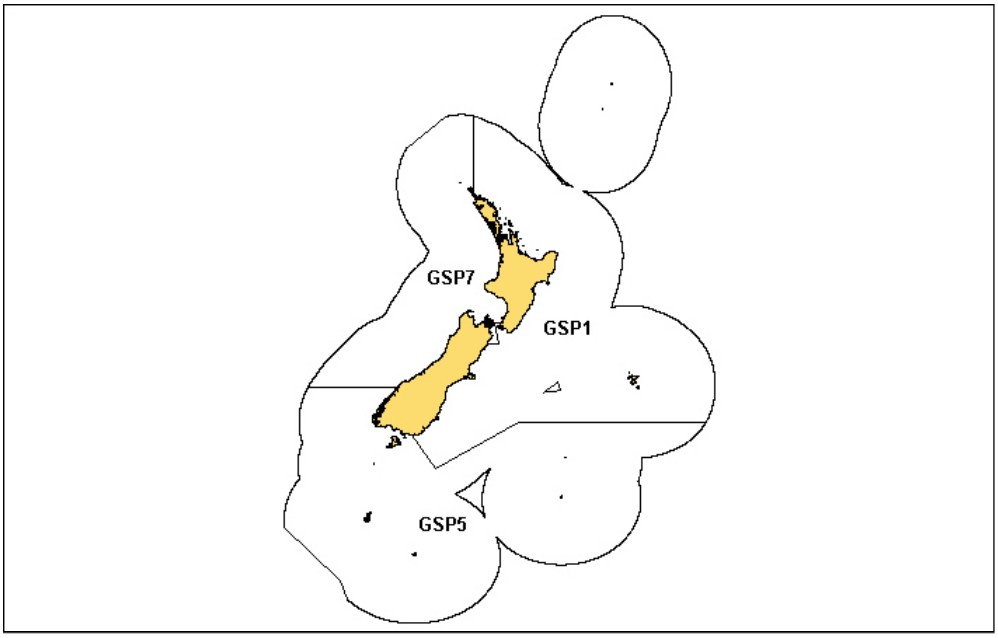
175 The Plenary regarded decision rules to be unnecessary on the grounds that a full analysis of all information every two to three years is a more effective way to review the performance of the stock. If successful this AMP would undergo a full review in March 2007, and again in 2010.

Environmental considerations

176 Given the increase in TACC is requested to cover existing over-catch in the trawl fishery, no increase in effort or environmental impact is anticipated for either the trawl or the set-net fisheries.

PALE GHOST SHARK (GSP 1) AMP PROPOSAL – INITIAL POSITION PAPER

Figure 1. Map showing the boundaries of GSP 1



Key Issues to be Considered

1 The key issues to be considered for the proposed pale ghost shark (GSP 1) Adaptive Management Programme (AMP) are:

a) MFish has received a proposal from the South East Finfish Management Limited (SEFML) to increase the Total Allowable Commercial Catch (TACC) for GSP 1 by 100% from 509 tonnes to 1 018 tonnes under a five-year AMP;

b) The GSP 1 fishery is entirely a commercial bycatch species, primarily of trawling for hoki and, to a lesser extent, ling, squid, and orange roughy;

c) Biological characteristics (late maturity, slow growth and low fecundity) of pale ghost shark make it likely to be susceptible to overfishing;

d) GSP 1 was introduced into the QMS in 1999 with a Total Allowable catch (TAC) and TACC of 509 tonnes. Allowances for customary and recreational fishing interests, and other sources of fishing-related mortality, were set at zero tonnes;

e) The TAC was based on estimated commercial catch levels derived from catch attributed to the general ghost shark code either from trawl survey information or, in more recent fishing years, apportionment of GSP 1 on the basis that it comprised 25% of the total ghost shark catch;

f) The TACC for GSP 1 was exceeded in each of the four fishing years following introduction of pale ghost sharks in the QMS;

g) A stock assessment has not been completed and no estimate of the yield is available. The fishery appears to be satisfactorily monitored using relative abundance indices derived from the annual Chatham Rise trawl survey, as well as biological information collected from these surveys;

h) Relative abundance indices since 1992 indicate no detectable change in abundance of pale ghost sharks. Recent surveys indicate good recruitment of small pale ghost sharks;

i) The December 2003 AMP Plenary (Plenary) consider the biomass of GSP 1 is likely to be above the size that will support the maximum sustainable yield (MSY);

j) An opportunity exists to use the AMP and Low Knowledge Bycatch (LKB) frameworks to increase the GSP 1 TACC to reflect current stock levels; and

k) The costs and benefits of different monitoring programmes proposed under the AMP and LKB frameworks are assessed to determine the preferred option.

Management Options

2 The proposed management framework options for the TAC, TACC and allowances for GSP 1 are presented in Table 1.

Table 1: Proposed management framework options for TAC, TACC and allowances (tonnes) for GSP 1

Programme	TAC	Customary allowance	Recreational allowance	Other sources of fishing-related mortality	Proposed TACC	%TACC increase
Low-Knowledge Bycatch Stock						
(Option 1)	1 069	0	0	51	1 018	100
(Option 2)	1208	0	0	58	1 150	126
Adaptive Management Programme (option 3)	1 069	0	0	51	1 018	100

3 Options 1 and 2 propose to set a TAC within the LKB framework. Under option 1, the TACC is set at the same level as the proposed AMP (ie, 1 018 tonnes). Under Option 2, the TACC is set at 1 150 tonnes, based on average reported landings in the past three fishing years (ie, 2000-01 to 2002-03). The TAC set under each option would be reviewed after three years (commencing 1 October 2004).

4 Option 3 proposes to set the TAC within a five-year AMP (commencing 1 October 2004) as follows:

a) Increase the TACC from 509 tonnes to 1 018 tonnes (100% increase);

b) SEFML will analyse contrast in GSP 1 biomass indices and biological information obtained from the summer Chatham Rise trawl survey; and

c) SEFML will analyse contrast in MFish CPUE data to derive supplementary relative abundance indices for GSP 1 bycatch of the hoki target bottom trawl fishery in FMAs 3 and 4.

5 Options 1 and 2 do not require commercial fishers to undertake supplementary monitoring, as proposed under Option 3.

6 Under all options, MFish proposes to include a new allowance for other sources of fishing-related mortality within the TAC. This allowance is based on 5% of the TACC.

Rationale for Proposed Management

TAC

7 For the purposes of varying a TACC for a quota management stock, the Fisheries Act 1996 (the Act) requires a Total Allowable Catch (TAC) to be set under s 13 or s 14 of the Act. MFish proposes to retain the GSP 1 fishery under s 13 because the biological characteristics of the stock allow a MSY to be estimated, the fishery is not part of any international agreement, and the fishery is not managed on a rotational or enhanced basis.

8 A TAC/TACC of 509 tonnes was set for the GSP 1 fishery to support the stock's introduction into the QMS in October 1999. The TAC has been significantly overcaught since introduction of the species into the QMS.

9 In the absence of an estimate of sustainable yield from a fishery, TACs at the time of introduction into the QMS are based on estimates of total removals from the fishery. The TAC for the GSP 1 fishery is based on average reported landings. Use of average landing data prior to QMS entry is problematical for pale ghost shark because:

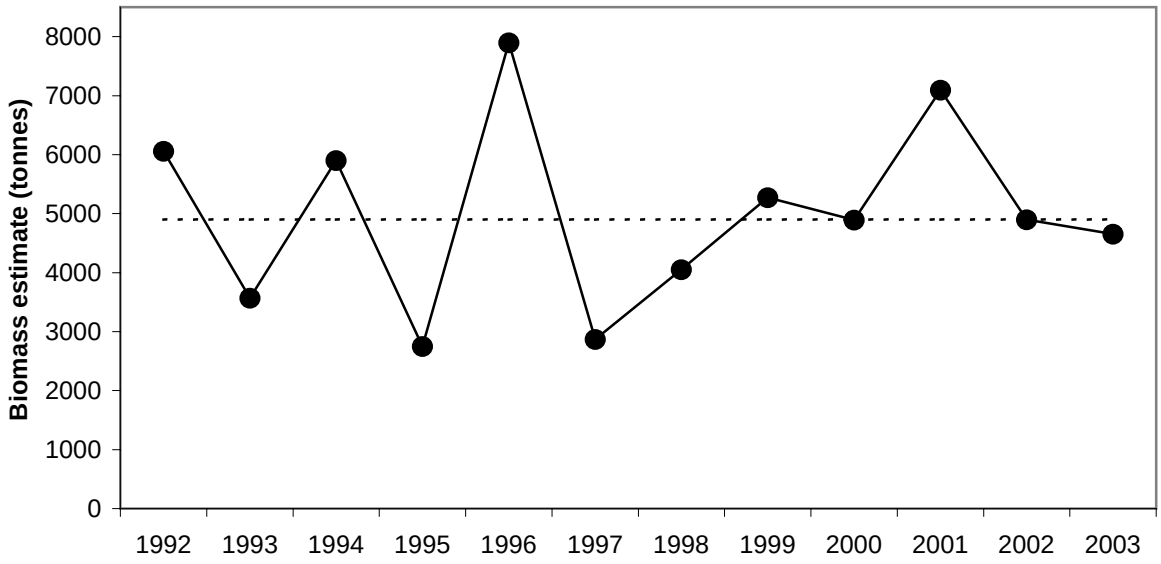
- Pale and dark ghost shark catches were reported under a combined code. Catch under this combined code was apportioned to set the pale and dark ghost shark TACs; and

- Significant quantities of pale ghost shark were probably discarded and not reported.

10 Information on catches and abundance since the GSP 1 fishery was introduced into the QMS indicates the current TAC may be set at a level that is lower than historical catch levels prior to 1999. The TAC does not appropriately provide for efficient utilisation given the low level of risk to the stock.

11 The 2003 Plenary notes the stock size of GSP 1 is uncertain and there are no robust data available to estimate biomass. However, annual trawl surveys of the Chatham Rise (by *RV Tangaroa*) provide a satisfactory fishery-independent indicator of relative abundance in which to monitor stock status (with low coefficients of variation ie, 6-12%). Since 1992, biomass indices from the survey show no apparent change in abundance (Figure 1) and recent surveys suggest good recruitment. The Plenary also notes that length frequency and sex ratio information collected during the trawl surveys show consistent patterns in the 12 years of data. The Plenary concludes that stock abundance appears stable or increasing at current catch levels.

Figure 2: Biomass indices (tonnes) from the Chatham Rise trawl survey since 1992 (mean biomass index is plotted as dotted line)



12 The Chatham Rise trawl survey series suggests that previous catch levels have had no impact on the biomass of pale ghost shark and recorded catches are likely to underestimate actual catches. The Plenary agrees the estimated catches on which the original TACC of GSP 1 was based are likely to have been much lower than the actual catches.

13 The Plenary concludes the GSP 1 biomass is likely to be above the size that will support the MSY. The Plenary believes that, on balance, the TAC and TACC, at the levels proposed in the AMP, are likely to allow the stock to move towards a size that will support the MSY or remain at, or above, the level that will support the MSY over the five year period.

14 The majority of pale ghost shark landings are primarily taken as a bycatch in the associated HOK 1 fishery. Given the possibility of reduced catch levels in the HOK 1 fishery (TAC/TACC for this fishery is to be reviewed as part of the review of sustainability measures and other management controls for the 2004-05 fishing year), it is likely that catches of pale ghost shark will not exceed current levels. Rather, it is possible that pale ghost shark catches may demonstrate a corresponding decrease from existing levels as effort in the HOK 1 fishery decreases.

15 The TAC does not incorporate allowances for non-commercial interests or other sources of fishing-related mortality. MFish is proposing to set a new TAC for the GSP 1 fishery that incorporates a higher TACC and a new allowance for other sources of fishing-related mortality. The proposed TAC retains zero allowances for customary and recreational interests. The proposed TAC and other management measures take into account statutory considerations.

Policy frameworks

16 MFish has considered increasing the TACC under the AMP and LKB frameworks. On balance, MFish considers there is sufficient justification to increase the TACC based on existing stock assessment information (including an existing fishery-independent indicator of abundance) without imposing the additional costs of an AMP on industry.

17 The fishery satisfies the following criteria for a TACC adjustment as a LKB species:

- The fishery is primarily a bycatch fishery of the target trawl fishery for hoki;
- There is no stock assessment information to determine an appropriate sustainable yield;
- There are no known sustainability concerns under current reported catch levels;
- Catch has exceeded the TACC in each of the four years following introduction of pale ghost sharks into the QMS;
- Catch has exceeded the TACC by at least 100% in the past three fishing years; and
- There has been no TACC increase for the past four fishing years.

18 In considering the preferred management framework, MFish note the following key characteristics of this fishery:

a) The Plenary assesses that current biomass is likely to be above the level that will support MSY;

b) The principal method to monitor the fishery is via the Chatham Rise trawl survey information;

c) The fishery is almost solely taken (90%) as a bycatch of the HOK 1 fishery. Fishers will only take pale ghost shark as a consequence of their fishing activity for the target species. Because of the bycatch nature of the stock it is not clear whether any additional monitoring of the fishery under the AMP is necessary; and

d) There are no sustainability concerns at current catch levels. Although an accurate assessment of biomass does not exist, the available information suggests that recent recruitment has been good and the stock is likely to be above the MSY.

19 Under the LKB options, the annual Chatham Rise trawl survey would continue to monitor stock status. MFish anticipates that stock levels under these options would remain sustainable over the long-term and enable fishers to balance catches at current catch levels. Catch information for the fishery would be reviewed after three years (2008).

20 The main benefit of the proposed AMP is the collection of supplementary stock assessment information to assess stock status. While the SEFML has proposed a research programme to support a higher TACC, it is uncertain whether the programme would provide useful alternative fishery-dependent information with which to assess the stock.

21 MFish note that consideration could be given in the future to managing the stock under s 14A of the Act.

Recreational allowance

22 It is very unlikely that a recreational fishery exists for GSP 1. The fishery occurs well offshore in water depths between 400 and 800 m and there is no documented effort of recreational fishers targeting pale ghost sharks. A recreational harvest estimate for the GSP 1 fishery does not exist.

23 MFish considers it is appropriate to retain a zero allowance for recreational interests.

24 While considering the allowance for recreational interests, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made pursuant to s 311 of the Act (s 21(5) of the Act). No such regulations have been made.

Customary Mäori allowance

25 In considering the proposed allowance for customary non-commercial interests, the Minister is required to take into account any mätaitai reserve or s 186A closure in the relevant QMA (s 21(4) of the Act). No such management measures are in place within the GSP 1 fishery. Taiäpure or mätaitai reserves exist in the GSP 1 area but are restricted to inshore coastal areas and outside the normal range of GSP 1.

26 Pale ghost shark does not appear to be a traditional Mäori fishery. There is no quantitative information available on the current level of Mäori customary harvest of GSP 1. MFish considers it unlikely that there is, or has been, any significant customary catch of GSP 1.

27 MFish considers it is appropriate to retain a zero allowance for customary interests.

Other sources of fishing-related mortality

28 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality associated with the GSP 1 fishery. It is highly likely that a proportion of pale ghost sharks is misreported as dark ghost sharks. Given the recent increase in reported catch levels of pale ghost sharks, it is possible that some commercial fishers will discard GSP 1 to avoid deemed value penalties. It is also likely that some indirect fishing-mortality will occur through the escape of fish from nets.

29 MFish considers it appropriate to include a new allowance for other sources of fishing-related mortality when setting a TAC for GSP 1. MFish proposes that this allowance be 5% of the TACC.

TACC

30 As a bycatch fishery with no immediate sustainability concerns and fishery independent monitoring of abundance, a primary objective for management of the fishery should be to provide a framework that encourages reporting. To support this objective, the management framework should ensure that industry do not face unnecessary cost beyond that which needs to be imposed in order to manage risk in the fishery. In assessing an appropriate TACC, MFish considers current reported landings to be an accurate reflection of the total catch taken in the fishery.

Low knowledge bycatch framework

31 The GSP 1 fishery meets the requirements for inclusion under the LKB framework.

32 MFish considers there are two options to set a TACC under the LKB fishery that would best align the fishery with the management objectives given its current characteristics. Each option is outlined below.

Option 1

33 Under Option 1, the TACC would be increased to 1 018 tonnes. The proposed TACC provides the same level of TACC increase as the proposed AMP but does not require commercial fishers to undertake supplementary monitoring. MFish notes the proposed TACC is 256 tonnes less than the commercial catch in the last fishing year (1 274 tonnes).

34 Under this option, it is likely that some fishers will continue to pay deemed values in years where catches exceed the TACC.

35 The 2003 Plenary consider that, on balance, the TACC and TAC, at the level proposed under Option 1, are likely to allow the stock to move towards a size that will support the MSY, or remain at or above the level that will support the MSY over the five-year period.

Option 2

36 Under Option 2, the TACC would be increased to 1 150 tonnes. The proposed TACC is based on average reported commercial landings in the past three fishing years (ie, 2000-01 to 2002-03). Reported landings were relatively stable during these fishing years following the introduction of the stock into the QMS. (The increase in landings directly following QMS introduction most likely reflects more accurate identification and reporting of pale ghost shark catches.) MFish notes the proposed TACC is 124 tonnes less than the commercial catch in the last fishing year.

37 Under this option, it is likely that some fishers will continue to pay deemed values in years where catches exceed the TACC. The extent of this problem is likely to be less than under option 1 by virtue of a higher TACC level.

38 The 2003 Plenary did not consider the risks of the proposed TACC under Option 2 on the sustainability of the GSP 1 stock. However, catches have been taken at this proposed TACC level for at least the last four years with no apparent adverse effects on the stock.

Monitoring

39 Options 1 and 2 do not require fishers to collect supplementary stock assessment information to assess the performance of the fishery under a higher TACC, as proposed under the AMP. While the industry would be encouraged to implement the proposed research programme to improve the knowledge of this fishery, there would be no obligation for this programme to proceed under the LKB framework.

40 Under the LKB framework approach, the fishery would be reviewed after three years (ie, 2008). Monitoring of the fishery would continue using the Chatham Rise trawl survey. MFish could review the GSP 1 TAC if the trawl survey indices are declining and the catch level is found to be markedly below the proposed TACC after this time. This approach will ensure that catch level remains sustainable in the long-term.

Adaptive Management Programme (Option 3)

41 The SEFML has proposed to increase the TACC for GSP 1 by 100% from 509 tonnes to 1 018 tonnes for a five-year period under an AMP. The proposed TACC is 13% less than the average commercial catch of the last three fishing years and 25% less than the most recent fishing-year catch. On the basis of analyses of MFish catch and effort information, SEFML contends that annual catches of GSP 1 prior to QMS introduction are more likely to have been about 1 000 tonnes rather than 300-400 tonnes estimated earlier.

42 The primary objective of the proposed GSP 1 AMP is to determine the size, geographical extent, and long-term sustainable yield of GSP 1. The extent of the SEFML's proposed TACC increase reflects current catch levels and is intended to provide contrast in the abundance indices to determine current biomass and long-term yields for GSP 1. In addition, the facilitation of collective agreements under an AMP framework is a useful precursor to development of fisheries plans.

43 The Plenary has evaluated the merits of the proposed AMP and considers it meets the requirements for inclusion under the AMP framework. The Plenary did not consider the merits of a higher TACC equivalent to Option 2 under the AMP framework.

44 The Plenary consider that, on balance, the TACC and TAC at the level proposed in the AMP are likely to allow the stock to move towards a size that will support the MSY, or remain at or above the level that will support the MSY over the five-year period.

45 A full review of the GSP 1 fishery under the AMP would take place in 2007, as prescribed by the Plenary decision rule. Fishery-independent information on relative abundance and biological information will be available from trawl surveys. Bycatch CPUE abundance indices will be provided by SEFML.

Analysis of options

46 The TACC is currently constraining the efficient utilisation of the GSP 1 stock as catches are exceeding the available ACE holdings. Consequently, the industry is unable to take advantage of current biomass levels of pale ghost shark as some commercial fishers are required to pay deemed value penalties for catches in excess of their respective ACE holdings. The TACC is also impacting on the efficient utilisation of the associated target fisheries as fishers attempt to modify their fishing activities to reduce or avoid catching GSP 1.

47 The Act requires the setting of a TAC for GSP 1 that ensures the stock is managed at a level at or above B_{MSY} in the long-term. The biomass of GSP 1 is likely to be above the size that will support the MSY and stock abundance appears stable, or increasing, at current catch levels. MFish anticipates the GSP 1 stock level under the proposed TACs and TACCs of either the AMP or LKB frameworks are likely to remain sustainable over the long-term.

48 Options 1 and 2 seek to address the problems that have been associated with mis-reporting in the fishing years prior to introduction to the QMS using the LKB framework. The benefit of both options is to generate sufficient ACE to enable fishers to balance catches without the need to undertake the additional research programme. Option 1 increases the TACC to the same level as the proposed AMP proposal, while Option 2 provides a larger TACC increase to reflect average catch in the last three fishing years. Both options adjust the TACC to reflect a level of catch that likely existed prior to the introduction of pale ghost shark into the QMS, and is, thereby, unlikely to lead to an increase in overall exploitation rate nor increased sustainability risk to the stock.

49 Given the GSP 1 fishery is primarily a bycatch fishery, Option 2 would provide industry with greater flexibility to manage changes in abundance of the target and bycatch stock over time. For this reason, MFish does not anticipate that the TACC would be taken in every year. A reduction in fishing effort in the associated HOK 1 fishery may lead to a corresponding reduction in pale ghost shark catches.

50 The costs on industry under Options 2 and 3 would be less than the proposed AMP because there is no obligation for fishers to implement the proposed supporting research programme. The performance of the fishery appears to be satisfactorily assessed using the existing Chatham Rise trawl survey series, and monitoring of the fishery would continue using relative biomass and biological information from this annual trawl survey.

51 Although there is no obligation for the research programme to proceed under the LKB framework, industry would be encouraged to collect additional information to improve the knowledge of the fishery under a higher catch level.

52 Option 3 sets a TACC equivalent to Option 1, but using the AMP framework. The benefit of the proposed TACC is to generate sufficient ACE to enable fishers to balance catches, while the supporting AMP programme will collect supplementary stock assessment information to better assess the performance of the fishery under a higher commercial catch level. The facilitation of collective agreements under an AMP framework is also a useful precursor to development of fisheries plans. The proposed AMP will, however, impose additional costs on the industry to

implement and support the proposed research programme. Given the performance of the fishery appears to be satisfactorily monitored by the existing annual Chatham Rise trawl survey series, the value of the proposed research programme is uncertain. Nevertheless, MFish considers the TACC increase under the proposed AMP meets the requirements for inclusion of the stock under the AMP framework.

53 MFish has considered the risk of fishing to the GSP 1 stock under both proposed TACC levels (ie, 1 018 tonnes and 1 150 tonnes). While the Plenary has only considered the lower TACC option (due to the receipt of the AMP proposal), MFish considers the higher TACC option, based on recent average catch levels, is unlikely to impose any additional risk to the fishery. Reporting is likely to have improved since introduction of GSP 1 to the QMS and the proposed TACC probably reflects catch levels prior to QMS introduction. The Chatham Rise trawl survey indices suggest that fishing at current levels has not had an adverse effect on the stock.

54 MFish supports Option 2 to set the TACC under the LKB framework. MFish considers that a TACC that reflects current catch levels will better enable fishers to balance catches without the need to pay deemed value penalties in most years. The potential adjustment to the TACC in the HOK 1 fishery may reduce catch of pale ghost shark. Increasing the TACC under Option 2 is appropriate as it meets the purpose of the Act to provide for the efficient utilisation of GSP 1 and its associated target fisheries. The approach will enable fishers to balance catches under current catch levels without imposing unnecessary costs on the industry to support the additional research under the AMP.

55 MFish considers the proposed TACC under Option 2 will have a negligible impact on non-commercial interests.

Future Management

56 Under Options 1 and 2, a review of the performance of the fishery under the LBK framework would be conducted in 2008. The proposed AMP, under Option 3, would run for five years (beginning 1 October 2004) with a review of all fishery information in 2007. SEFML would monitor the fishery each year and report back to the plenary in 2007 and 2010. A summary of proposed management actions for GSP 1 under the proposed AMP and LKB frameworks is shown in Table 2.

Table 2: Proposed management actions under the AMP and Low Knowledge Bycatch frameworks

	Initial assessment	Monitoring	Program review	Trigger points	Outcome
LKB		Existing Chatham Rise trawl GSP 1 indices and biological data Catch information	2008	Review all information	Review TAC, TACC and allowances
AMP	2007	Existing Chatham Rise trawl GSP 1 indices and biological data Catch information New bycatch CPUE indices of hoki target trawl fishery	2010	Review all information	Review TAC, TACC and allowances

57 MFish will be undertaking further surveys to determine the levels of recreational catch (including GSP 1) over the next five years and updated estimates of customary Mäori catch might also be available from reporting under the Fisheries (Kaimoana Customary Fishing) Regulations 1998 and the Fisheries (South Island Customary Fishing) Regulations 1999.

Conclusion

58 SEFML has proposed that the TACC for GSP 1 be increased from 509 tonnes to 1 018 tonnes under a five-year AMP.

59 Both SEFML and the Plenary note the estimated catches on which the original TACC of 509 tonnes was based are likely to have been much lower than actual catches due to mis-reporting of dark and pale ghost shark. The Plenary conclude, from Chatham Rise trawl survey indices and biological information, that stock abundance appears stable or increasing at current catch levels.

60 The Plenary has concluded that the GSP 1 biomass is likely to be above the size that will support the MSY. The Plenary also agrees that, on balance, the TAC and TACC, at the levels proposed in the AMP framework, are likely to allow the stock to move towards a size that will support the MSY or remain at, or above, the level that will support the MSY over the next five years.

61 MFish considers the GSP 1 fishery meets the criteria for consideration under both the LKB and AMP frameworks and proposes three options to increase the TACC for the GSP 1 fishery. Option 1 proposes to set the TACC at 1 018 tonnes under the LKB framework to reflect the AMP proposal. Option 2 proposes to set the TACC at 1,150 tonnes under the LKB framework to reflect average catches in the past three fishing years. Option 3 proposes to set the TACC at 1 018 tonnes under the AMP framework. There is no obligation for fishers to implement and support the proposed research programme under Options 1 and 2.

62 The costs on industry under the LKB framework would be less because there is no obligation to analyse GSP 1 bycatch CPUE from the bottom trawl fishery for hoki. However, the ability to monitor the effect of a higher TAC and TACC on stock status would be less than under an AMP if this supplementary information was not gathered. Monitoring of the fishery would continue using relative biomass indices (and biological information) derived from the annual Chatham Rise trawl survey. This survey provides a satisfactory fishery-independent indicator of relative abundance to monitor stock performance under a higher catch level.

63 MFish has considered the risk of fishing to the GSP 1 stock under both proposed TACC levels (ie, 1 018 tonnes and 1 150 tonnes). MFish considers the higher TACC option based on recent average catch levels is unlikely to impose any additional risk to the fishery as it probably reflects catch levels prior to QMS introduction. The Chatham Rise trawl survey indices suggest that fishing at current levels has not had an adverse effect of the stock.

64 MFish supports Option 2 to increase the TACC to 1 150 tonnes under the LKB framework. This approach is appropriate as it meets the purpose of the Act to provide for the efficient utilisation of GSP 1, and its associated target fisheries, without imposing unnecessary costs on the industry to support the additional research under

the AMP. The proposed TACC reflects current catch levels and will better enable fishers to balance catches without the need to pay deemed value penalties in most years.

65 No significant concerns have been identified regarding other statutory considerations that affect the setting of a TAC and TACC and allowances for GSP 1.

Preliminary Recommendations

66 MFish proposes to include GSP 1 under the Low Knowledge Bycatch framework that will:

a) set the TAC at 1 208 tonnes;

b) make an allowance of 58 tonnes for other sources of fishing-related mortality;

c) retain the allowance of zero tonnes for customary Mäori interests and zero tonnes for recreational interests;

d) increase the TACC from 509 tonnes to 1 150 tonnes; and

e) review the performance of the fishery under the proposed TAC in 2008.

ANNEX ONE

Statutory Considerations

67 In forming management options for GSP 1, the following statutory considerations have been taken into account.

TAC

68 The purpose of the Act (as provided in s 8) is to provide for utilisation of fisheries resources while ensuring sustainability. The proposed AMP and LKB frameworks for GSP 1 seek to increase the TACC to enable fishers to balance catches at current catch levels. The current GSP 1 TAC is less than 50% of the annual catch of the past four fishing years. The current TACC inhibits the efficient utilisation of the GSP 1 resource and the associated bycatch fisheries. A TACC increase under the AMP and Low Knowledge Bycatch frameworks is consistent with the purpose of the Act to provide for better utilisation of the fishery, in light of increased biomass, while ensuring catch levels remain sustainable. As such, the proposed TAC, TACC, and allowances would enable people to provide better for their social, cultural and economic well-being.

69 The TAC set under s 13(2) of the Act should be set at a level that moves the stock towards a level that can produce the MSY. That level is currently unknown for GSP 1, although the Plenary agree that the biomass (although unknown) is likely to be above the level that will support the MSY. As such, it may be difficult to assess the fishery in relation to MSY at any one time. Nevertheless, the Plenary note historical catch was under-reported and Chatham Rise trawl surveys indicate the stock appears stable or increasing at reported current catch levels.

Environmental

70 The proposed TAC options are also based on:

a) GSP 1 does not appear to be prone to significant fluctuations in biomass from year to year as stock abundance appears stable or increasing at current catch levels. MFish considers it is not necessary to take into account natural variability when setting or varying the TAC/TACC or other allowances (s 11 (1) c);

b) The Plenary note that catch of GSP 1 is taken as a bycatch of the hoki target fishery. MFish considers there would be no increased environmental impacts associated with the proposed GSP 1 TAC increase as no increase in actual catch is proposed under either the AMP or LKB frameworks;

c) There are no known interactions between the existing GSP 1 fishery and non-harvested species that are of concern or specific to the fishery under current catch levels. GSP 1 is usually processed at sea to the dressed state. The fishery does not generate any significant amount of fish waste or offal at sea as it is usually processed into fishmeal on board the fishing vessel, so the potential for interactions with seabirds is not significant. The draft Seabird Interaction with Fisheries in the New Zealand Exclusive Economic Zone -

A Review and National Plan of Action 2000 document does not list pale ghost shark as one of the fisheries with seabird interactions that are of concern;

d) GSP 1 is entirely a commercial bycatch fishery, primarily of trawling targeting hoki and to a lesser extent ling, squid, and orange roughy. The proposed TAC, TACC, and allowances will provide for the GSP 1 fishery to provide for operation at current catch levels. Accordingly, it is unlikely that the proposed TAC, TACC, and allowances will impact on the interdependence of stocks (s 13 (2)(c)); and

e) There should be benefits from continuation of the cost-effective gathering of information from the fishery. Monitoring of the GSP 1 fishery under the LKB framework would continue to be based on the relative abundance indices biological information from the Chatham Rise trawl surveys without the requirement for additional research under the proposed AMP. Improved assessments of the GSP 1 stock and yields under the LKF framework will enhance the long-term sustainable utilisation of the fishery;

71 The Act also requires (s 9(b)) that the biological diversity of the aquatic environment should be maintained. There are no known impacts on biodiversity that would be specific to the GSP 1 as a bycatch fishery at current catch levels.

72 Section 9(c) of the Act requires that habitats of particular significance to fisheries management should be protected. MFish notes the proposed TACC increase is largely intended to cover existing catch and, therefore, the proposal will have no further implications for any habitats of particular significance to fisheries.

Allocation

73 Increasing the GSP 1 TAC, as proposed under the AMP and LKB frameworks, will have economic benefits in the short term but longer-term benefits will be dependent on stock status. A higher TACC would enable fishers to balance catches against ACE and reduce the need to pay deemed value penalties. Increasing the TACC under the LKB framework provides potential for greater economic benefits without creating any anticipated social, economic or cultural issues for other sectors (s 13 (3)).

Other statutory considerations

74 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks, and the maintenance of biodiversity). There are no international obligations specific to GSP 1. MFish considers issues arising under the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for GSP 1 (s5 (a) & (b)).

75 Section 11(1)(b) provides that the Minister must take into account existing controls when setting or varying a sustainability measure such as a TAC. The GSP 1 fishery is mostly commercially fished using the trawl method. Apart from the existing TAC, TACC, and allowances the other important existing fisheries management control under the 1996 Act that affects GSP 1 is a minimum fishing net mesh size of 100 mm.

76 A fishery plan has not been developed or approved for GSP 1 (s 11(2A)(b)).

77 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 the proposal will affect existing or proposed fisheries services, nor any additional conservation service requirements (s 11(2A)(a & c)).

78 Before setting or varying any sustainability measure for GSP 1, the Minister must take into account any provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987.

79 Conservation strategies identify a number of issues of significance to GSP 1, including advocating for the sustainable use of marine fisheries and promoting the protection of significant marine ecosystems from the adverse effects of fishing practices.

80 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 that are relevant to the setting proposed TACC increase under this GSP 1 LKB (s 11(2)(b)).

81 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. Taiäpure or mätaitai reserves exist in the GSP 1 area but these areas are outside the range of the GSP 1 fishery.

82 No restrictions have been placed on fishing in any area within the QMA for recreational interests using the provisions in s 311 (s 21(1)(a &b), 4(i & ii), 5).

83 The information principles of the Act require that decisions be based on the best available information, take 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 (s 10).

84 MFish considers that the AMP proposal and plenary information used to evaluate the GSP 1 proposals is the best available. While it is recognised that the current status of the stock is uncertain, the research and monitoring criteria for the proposal will allow for improved information to be obtained. MFish does not believe that the uncertainty about the stock status is a reason to prevent the Minister from approving the LKB or AMP TACC proposal and associated TAC.

ANNEX TWO

Biological Characteristics

85 Pale ghost shark is a member of the family Chimaeridae. Pale ghost sharks occur throughout the Exclusive Economic Zone and are most abundant in water depths of 400-1000 m off the Chatham Rise and in Southland/Sub-Antarctic waters. Pale ghost shark are uncommon north of latitude 40 S.

86 Little is known regarding the life cycle, migratory habits, fecundity, or longevity of pale ghost shark. There is no published information on growth rate or age of pale ghost shark. Length-frequency histograms indicate that females are larger and are likely to have a faster growth rate than males.

87 Size at 50% sexual maturity for pale ghost shark caught off the Chatham Rise is approximately 60 cm for males and 70 cm for females. Population age structure data or estimates of longevity are not available to estimate natural mortality.

88 Stomach contents indicate that pale ghost sharks are predominately bottom feeders.

Catch Information

Commercial fisheries

89 Approximately 98 % of the annual catch of pale ghost sharks in GSP 1 is taken as bycatch of targeted bottom and midwater trawling and 1-3% is taken by bottom longline fishing.

90 The majority of GSP 1 is taken from the Chatham Rise with lesser amounts from Cook Strait. The catches are taken in the northern half of QMA 3 and the western end of QMA 4.

91 GSP 1 was introduced into the QMS in 1999 at which time the TACC was set at 509 tonnes. Since entry into the QMS, the TACC has been exceeded each fishing year. In 2002-03, the catch exceeded the TACC by 150%.

Table 3: **Reported landings (tonnes) and TACCs (tonnes) of pale ghost sharks from GSP 1 from 1989–90 to 2002-03.**

Year	Landings (tonnes)	TACC (tonnes)
1989–90	98	-
1990–91	219	
1991–92	316	
1992–93	329	
1993–94	218	
1994–95	310	
1995–96	326	
1996–97	434	
1997–98	355	
1998–99	448	
1999–00	577	509
2000–01	1 142	509
2001-02	1 033	509
2002-03	1 274	509

92 Further commercial catch information can be found in the *GSP 1 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 24 November 2003, produced by the South East Finfish Management Limited. This document can be viewed on the Ministry of Fisheries website at: <http://www.fish.govt.nz/sustainability/research/assessment/index.html>[2]. Under '2003 Working Group Documents', the required document is listed as 'GSP 1 AMP Proposal'.

Mäori customary fisheries

93 Quantitative information is not available on the level of customary Mäori catch, although is likely to be negligible.

Recreational fisheries

94 Recreational fishing surveys do not provide recreational harvest estimates for pale ghost shark. The recreational catch is considered to be negligible due to the offshore and deepwater habitat of this species.

Other sources of fishing-related mortality

95 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality of GSP 1. Since most of the catch is taken by bottom trawl gear, there will be some mortality associated with pale ghost sharks that escape through the net but are fatally injured. No minimum legal size applies to pale ghost sharks.

Existing controls

96 In addition to the TACC of 509 tonnes, fishers are required to use net mesh greater than 100mm.

97 There is no amateur daily bag limit for GSP 1.

[2] You will be asked for a username and a password. The username is: workinggroup; the password is: bluenose.

Social, cultural and economic factors

98 GSP 1 quota was being traded at $1 669 per tonne (as at 30 September 2003), with ACE traded at $51 per tonne. There were 74 quota owners in the fishery and 25 ACE holders, with ACE holdings ranging from 48 holders with less than 0.5 tonnes each to two holders with more than 100 tonnes each. The port price was $480 per tonne, so that the 498 tonne increase in the TACC is valued at $239 040 domestically, without taking any account of export value.

Research plan

99 There are no research projects that specifically relate to the GSP 1 fishery, apart from the annual Chatham Rise trawl survey.

Stock Assessment Information

100 The 2003 AMP plenary evaluated the stock assessment criteria, decision-rules, and monitoring programme of the SEFML's AMP proposal as part of the review required for proposed AMP fishstocks. The plenary report for GSP 1 follows.

Stock assessment criteria

101 The Plenary made the following conclusions regarding GSP 1:

a) The biomass is likely to be above the size that will support the MSY. The inclusion of this Fishstock in the AMP was justified under the following 'New AMP' criteria for 'Existing/Established' fisheries;

b) The stock size is uncertain, but the available information and analyses suggest that:

i) there is a reasonable probability that current biomass is greater than the size that will support the MSY;

ii) on balance, the new TACC and TAC level are likely to allow the stock to move towards a size that will support the MSY, or remain at or above the level that will support the MSY over the five year period of the programme; and

iii) stock abundance appears stable or increasing at current (actual) catch levels.

Monitoring criteria

102 The trawl survey of the Chatham Rise provides a good monitoring tool for the pale ghost shark and biological data will continue to be collected in these surveys. The survey covers the main areas where the fishery is concentrated and has low estimated CVs (6-12%). Length frequency and sex ratio information collected during the trawl survey show consistent patterns in the 12 years of data.

Decision rule criteria

103 The Plenary agreed to a decision rule to review all information in 2007 after a two year operation of the AMP.

Environmental considerations

104 The GSP 1 catches are generally taken as bycatch of the hoki target fishery. No increase in actual catch is likely and no associated impacts of fishing are known.

Future review

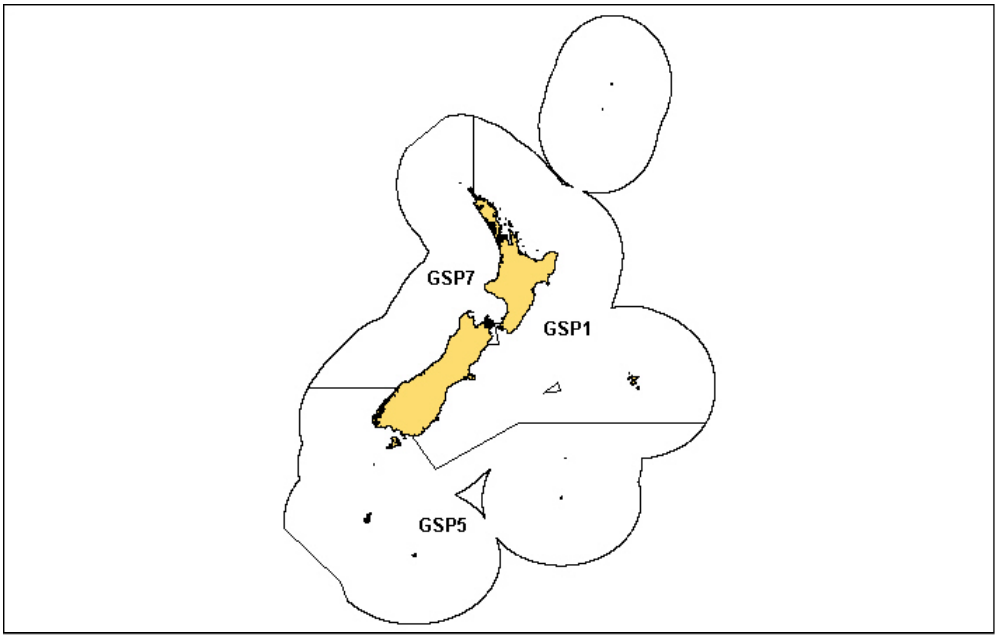
105 Review after two years in the AMP.

Conclusions

106 The Plenary agreed that GSP 1 could be considered for inclusion in the AMP. The trawl survey series suggests that previous catch levels have had no impact on the biomass of pale ghost shark, however, the actual level of catch is not known. The recorded catch history for this species is likely to underestimate actual catches. A revised catch history could be reconstructed based on assumptions concerning bycatch rates in the hoki fishery.

PALE GHOST SHARK (GSP 5) AMP PROPOSAL – INITIAL POSITION PAPER

Figure 1: Map showing boundaries of GSP 5



Key Issues to be Considered

1 The key issues to be considered for the proposed pale ghost shark (GSP 5) Adaptive Management Programme (AMP) are:

a) MFish has received a proposal from the South East Finfish Management Limited (SEFML) to increase the Total Allowance Commercial Catch (TACC) for GSP 5 by 240% from 118 tonnes to 401 tonnes for a five-year period under an AMP;

b) GSP 5 is entirely a commercial bycatch species, primarily of trawling for hoki, and to a lesser extent ling, scampi, and hake;

c) Biological characteristics (late maturity, slow growth and low fecundity) of pale ghost shark render it likely to be susceptible to overfishing;

d) The GSP 5 fishery was introduced into the QMS in 1999 with a Total Allowable Catch (TAC) and TACC of 118 tonnes. Allowances for customary and recreational fishing interests, and other sources of fishing-related mortality, were set at zero tonnes;

e) The TAC was based on estimated commercial catch levels derived from catch attributed to the general ghost shark code either from trawl survey information or, in more recent fishing years, apportionment of GSP 5 on the basis that it comprised 25% of the total ghost shark catch;

f) The TACC for GSP 5 has been exceeded in each of the four fishing years following the species' introduction into the QMS;

g) A stock assessment has not been completed for GSP 5 and no estimate of the yield is available. The GSP 5 fishery appears to be satisfactorily monitored using relative abundance indices derived from the annual sub-Antarctic trawl survey as well as biological information collected from these surveys;

h) Relative abundance indices since 1992 indicate no detectable change in abundance of pale ghost sharks. Recent surveys indicate good recruitment of small pale ghost sharks;

i) The December 2003 Plenary (Plenary) consider the biomass of GSP 5 is likely to be above the size that will support the maximum sustainable yield (MSY);

j) An opportunity exists to use the AMP and Low Knowledge Bycatch (LKB) frameworks to increase the GSP 5 TACC to reflect current stock levels; and

k) The costs and benefits of different monitoring programmes proposed under the AMP and LKB frameworks are assessed to determine the preferred option.

Management Options

2 The proposed management framework options for the TAC, TACC and allowances for GSP 5 are presented in Table 1.

Table 1: Proposed management framework options for TAC, TACC and allowances (tonnes) for GSP 5

Programme	TAC	Customary allowance	Recreational allowance	Other sources of fishing-related mortality	Proposed TACC	%TACC increase
Low-Knowledge Bycatch Stock						
(Option 1)	422	0	0	21	401	240
(Option 2)	477	0	0	23	454	285
Adaptive Management Programme (option 3)	422	0	0	21	401	240

3 Options 1 and 2 propose to set a TAC within the LKB framework. Under option 1, the TACC is set at the same level as the proposed AMP (ie, 401 tonnes). Under Option 2, the TACC is set at 454 tonnes, based on average reported landings in the past four fishing years (ie, 1999-00 to 2002-03). The TAC set under each option would be reviewed after three years (commencing 1 October 2004).

4 Option 3 proposes to set the TAC within a five-year AMP (commencing 1 October 2004) as follows:

a) Increase the TACC from 118 tonnes to 401 tonnes (240% increase);

b) SEFML will analyse contrast in GSP 5 biomass indices and biological information obtained from the summer sub-Antarctic trawl survey; and

c) SEFML will analyse contrast in MFish CPUE data to derive supplementary relative abundance indices for GSP 5 bycatch of the hoki target bottom trawl fishery.

5 Options 1 and 2 do not require commercial fishers to undertake supplementary monitoring, as proposed under Option 3.

6 Under all options, MFish proposes to include a new allowance for other sources of fishing-related mortality within the TAC. This allowance is based on 5% of the TACC.

Rationale for Proposed Management

TAC

7 For the purposes of varying a TACC for a quota management stock, the Fisheries Act 1996 (the Act) requires a TAC to be set under s 13 or s 14 of the Fisheries Act (the Act). MFish proposes to retain the GSP 5 fishery under s 13 because the biological characteristics of the stock allow a MSY to be estimated, the fishery is not part of any international agreement, and the fishery is not managed on a rotational or enhanced basis.

8 A TAC/TACC of 118 tonnes was set for the GSP 5 fishery to support the stock's introduction into the QMS in October 1999. The TAC has been significantly overcaught since introduction of the species into the QMS.

9 In the absence of an estimate of sustainable yield from a fishery, TACs at the time of introduction into the QMS are based on estimates of total removals from the fishery. The TAC for the GSP 5 fishery is based on average reported landings. Use of average landing data prior to QMS entry is problematical for pale ghost shark because:

- Pale and dark ghost shark catches were reported under a combined code. Catch under this combined code was apportioned to set the pale and dark ghost shark TACs; and

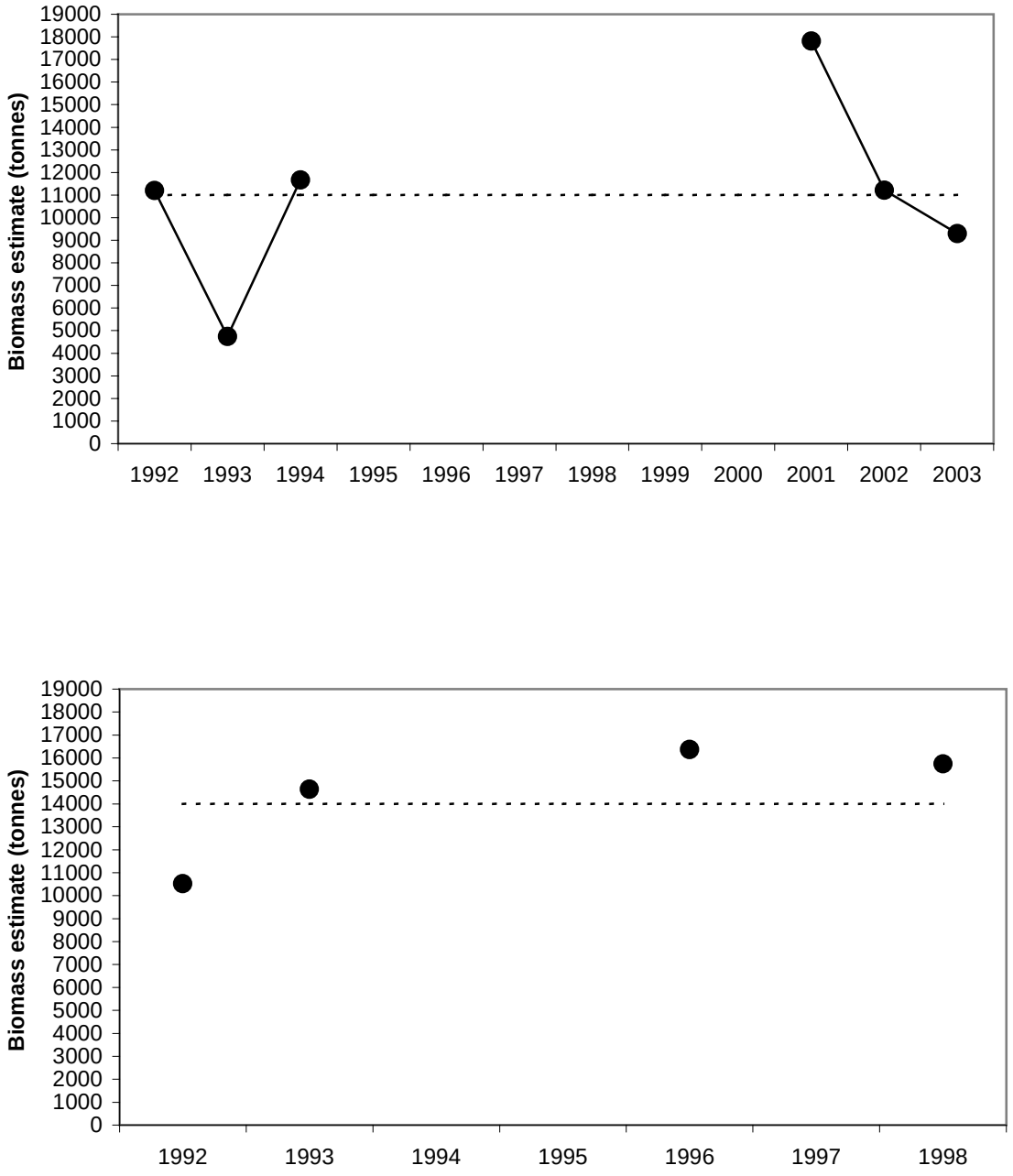
- Significant quantities of pale ghost shark were probably discarded and not reported.

10 Information on catches and abundance since the GSP 5 fishery was introduced into the QMS indicates the current TAC may be set at a level that is lower than historical catch levels prior to 1999. The TAC does not appropriately provide for efficient utilisation given the low level of risk to the stock.

11 Since 1992, fishery-independent information on relative abundance has been collected by two different trawl survey series (by *RV Tangaroa*). The annual summer and autumn sub-Antarctic surveys are considered to satisfactorily monitor the main pale ghost shark fishery (with low coefficients of variation ie, 6-12%), which is concentrated of the Auckland Islands, Campbell islands, and along the Stewart-Snares shelf. It is likely that only the summer survey will continue over the next few years.

12 The 2003 Plenary notes the stock size of GSP 5 is uncertain and there are no robust data available to estimate biomass. However, the sub-Antarctic trawl surveys show no change in relative abundance since 1992 (Figure 1), and recent surveys suggest good recruitment. The Plenary also notes that length frequency and sex ratio information collected during the trawl surveys show consistent patterns. The Plenary conclude that stock abundance appears stable or increasing at current catch levels.

Figure 2: **Biomass indices (tonnes) from the summer (above) and autumn (below) sub-Antarctic trawl surveys since 1992 (mean biomass index is plotted as dotted line)**



13 The summer sub-Antarctic trawl survey series suggests that previous catch levels have had no impact on the biomass of pale ghost shark and recorded catches are likely to underestimate actual catches. The Plenary agrees the estimated catches on which the original TACC of GSP 5 was based are likely to have been much lower than the actual catches.

14 The Plenary concludes the GSP 5 biomass is likely to be above the size that will support the MSY. The Plenary believes, on balance, the TAC and TACC at the levels proposed in the AMP are likely to allow the stock to move towards a size that will support the MSY or remain at, or above, the level that will support the MSY over the five year period.

15 The majority of pale ghost shark landings are primarily taken as a bycatch in the associated HOK 1 fishery. Given the possibility of reduced catch levels in the HOK 1 fishery (TAC/TACC for this fishery is to be reviewed as part of the review of sustainability measures and other management controls for the 2004-05 fishing year), it is likely that catches of pale ghost shark will not exceed current levels. Rather, it is possible that pale ghost shark catches may demonstrate a corresponding decrease from existing levels as effort in the HOK 1 fishery decreases.

16 The TAC does not incorporate allowances for non-commercial interests or other sources of fishing-related mortality. MFish is proposing to set a new TAC for the GSP 5 fishery that incorporates a higher TACC and a new allowance for other sources of fishing-related mortality. The proposed TAC retains zero allowances for customary and recreational interests. The proposed TAC and other management measures take into account statutory considerations.

Policy frameworks

17 MFish has considered increasing the TACC for GSP 5, to reflect recent catch levels, under the AMP and LKB frameworks. On balance, MFish considers there is sufficient justification to increase the TACC based on existing stock assessment information (including an existing fishery-independent indicator of abundance) without imposing the additional costs of an AMP on industry.

18 The fishery satisfies the following criteria for a TACC adjustment as a LKB species:

- The fishery is primarily a bycatch fishery of the target trawl fishery for hoki;
- There is no stock assessment information to determine an appropriate sustainable yield;
- There are no known sustainability concerns under current reported catch levels;
- Catch has exceeded the TACC in each of the four years following introduction of pale ghost sharks into the QMS;
- Catch has exceeded the TACC by at least 100% in the past three fishing years; and
- There has been no TACC increase for the past four fishing years.

19 In considering the preferred management framework, MFish note the following key characteristics of this fishery:

a) The Plenary assesses that current biomass is likely to be above the level that will support MSY;

b) The principal method to monitor the fishery is via the sub-Antarctic trawl survey information;

c) The fishery is almost solely taken (85-90%) as a bycatch of the HOK 1 fishery. Fishers will only take pale ghost shark as a consequence of their fishing activity for the target species. Because of the bycatch nature of the stock it is

not clear whether any supplementary monitoring of the fishery under the AMP is necessary; and

d) There are no sustainability concerns at current catch levels. Although an accurate assessment of biomass does not exist, the available information suggests that recent recruitment has been good and the stock is likely to be above the MSY.

20 Under the LKB options, the annual summer sub-Antarctic trawl survey would continue to monitor stock status. MFish anticipates that stock levels under these options would remain sustainable over the long-term and enable fishers to balance catches at current catch levels. Catch information for the fishery would be reviewed after three years (2008).

21 The main benefit of the proposed AMP is the collection of supplementary stock assessment information to assess stock status. While the SEFML has proposed a research programme to support a higher TACC, it is uncertain whether the programme would provide useful alternative fishery-dependent information with which to assess the stock.

22 MFish note that consideration could be given in the future to managing the stock under s 14A of the Act.

Recreational allowance

23 It is very unlikely that a recreational fishery exists for GSP 5. The fishery occurs well offshore, in water depths between 400 and 800 m, and there is no documented effort of recreational fishers targeting pale ghost sharks. A recreational harvest estimate for the GSP 5 fishery does not exist.

24 MFish considers it appropriate to retain a zero allowance for recreational interests.

25 While considering the allowance for recreational interests, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which regulations have been made pursuant to s 311 of the Act (s 21(5) of the Act). No such regulations have been made.

Customary Mäori allowance

26 Pale ghost shark does not appear to be a traditional Mäori fishery. There is no quantitative information available on the current level of Mäori customary harvest of GSP 5. MFish considers that it is unlikely that there is, or has been, any significant customary catch of GSP 5.

27 In considering the proposed allowance for customary non-commercial interests, the Minister is required to take into account any mätaitai reserve or s 186A closure in the relevant QMA (s 21(4) of the Act). No such management measures are in place within the GSP 5 fishery.

28 MFish considers it is appropriate to retain a zero allowance for customary interests.

Other sources of fishing-related mortality

29 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality associated with the GSP 5 fishery. It is highly likely that a proportion of pale ghost shark is misreported as dark ghost shark. Given the recent increase in reported catch levels, it is possible that some commercial fishers discard GSP 5 to avoid deemed value penalties. It is also likely that some indirect fishing-morality occurs through the escape of fish from nets.

30 MFish considers it appropriate to include a new allowance for other sources of fishing-related mortality when setting a TAC for GSP 5. MFish proposes that this allowance be 5% of the TACC.

TACC

31 As a bycatch fishery with no immediate sustainability concerns and fishery independent monitoring of abundance, a primary objective for management of the fishery should be to provide a framework that encourages reporting. To support this objective, the management framework should ensure that industry do not face unnecessary cost beyond that which needs to be imposed in order to manage risk in the fishery. In assessing an appropriate TACC, MFish considers current reported landings to be an accurate reflection of the total catch taken in the fishery.

Low knowledge bycatch framework

32 The GSP 5 fishery meets the requirements for inclusion under the LKB framework.

33 MFish considers there are two options to set a TACC under the LKB fishery that would best align the fishery with the management objectives given its current characteristics. Each option is outlined below.

Option 1

34 Under Option 1, the TACC would be increased to 401 tonnes. The proposed TACC provides the same level of TACC increase as the proposed AMP but does not require commercial fishers to undertake supplementary monitoring. MFish notes the proposed TACC is 201 tonnes less than the commercial catch in the last fishing year.

35 Under this option, it is likely that some fishers will continue to pay deemed values in years where catches exceed the TACC.

36 The 2003 Plenary consider that, on balance, the TACC and TAC, at the level proposed under Option 1, are likely to allow the stock to move towards a size that will support the MSY or remain at or above the level that will support the MSY over the five-year period.

Option 2

37 Under Option 2, the TACC would be increased to 454 tonnes. The proposed TACC is based on average reported commercial landings in the past four fishing years (ie, 1999-00 to 2002-03). Reported landings were relatively stable during these fishing years following the introduction of the stock into the QMS. (The increase in landings directly following QMS introduction most likely reflects more accurate identification

and reporting of pale ghost shark catches.) MFish notes the proposed TACC is 148 tonnes less than the commercial catch in the last fishing year (ie, 602 tonnes).

38 Under this option, it is likely that some fishers will continue to pay deemed values in years where catches exceed the TACC. The extent of this problem is likely to be less than under option 1 by virtue of a higher TACC level.

39 The 2003 Plenary did not consider the risks of the proposed TACC under Option 2 on the sustainability of the GSP 5 stock. However, catches have been taken at this proposed TACC level for at least the last four years with no apparent adverse effects on the stock.

Monitoring

40 Options 1 and 2 do not require fishers to collect supplementary stock assessment information to assess the performance of the fishery under a higher TACC, as proposed under the AMP. While the industry would be encouraged to implement the proposed research programme to improve the knowledge of this fishery, there would be no obligation for this programme to proceed under the LKB framework.

41 Under the LKB framework approach, the fishery would be reviewed after three years (ie, 2008). Monitoring of the fishery would continue using the summer sub-Antarctic trawl survey. MFish could review the GSP 5 TAC if the trawl survey indices are declining and the catch level is found to be markedly below the proposed TACC after this time. This approach will ensure that catch level remains sustainable in the long-term.

Adaptive management programme (option 3)

42 SEFML has proposed to increase the TACC for GSP 5 by 240% from 118 tonnes to 401 tonnes for a five-year period under an AMP. The proposed TACC is 12% less than the average commercial catch of the last four fishing years (ie, 454 tonnes) and 33% less than the most recent fishing year. On the basis of analysis of MFish catch and information data, SEFML contends that historical catches of GSP 5 prior to inclusion of pale ghost sharks into the QMS are more likely to have been on the order of 200-400 tonnes rather than earlier catch levels of 50-150 tonnes.

43 The primary objectives of the proposed AMP are to determine the size, geographical extent, and long-term sustainable yield of GSP 5. The extent of the SEFML's proposed TACC increase reflects current catch levels and is intended to provide contrast in the abundance indices to determine current biomass and long-term yields. In addition, the facilitation of collective agreements under an AMP framework is a useful precursor to development of fisheries plans.

44 The Plenary has evaluated the merits of the proposed AMP and considers it meets the requirements for inclusion under the AMP framework. The Plenary did not consider the merits of a higher TACC, equivalent to Option 2, under the AMP framework.

45 The Plenary consider that, on balance, the TACC and TAC at the level proposed in the AMP are likely to allow the stock to move towards a size that will support the MSY or remain at, or above, the level that will support the MSY over the five-year period.

46 A full review of the GSP 5 fishery under the AMP would take place in 2007, as prescribed by the Plenary decision rule. Fishery-independent information on relative abundance and biological information will be available from trawl surveys. Bycatch CPUE abundance indices will be provided by SEFML.

Analysis of options

47 The TACC is currently constraining the efficient utilisation of the GSP 5 stock as catches are exceeding the available ACE holdings. Consequently, the industry is unable to take advantage of current biomass levels of pale ghost shark as some commercial fishers are required to pay deemed value penalties for catches in excess of their respective ACE holdings. The TACC is also impacting on the efficient utilisation of the associated target fisheries as fishers attempt to modify their fishing activities to reduce or avoid catching GSP 5.

48 The Act requires the setting of a TAC for GSP 5 that ensures the stock is managed at a level at, or above, B_{MSY} in the long-term. The biomass of GSP 5 is likely to be above the size that will support the MSY and stock abundance appears stable, or increasing, at current catch levels. MFish anticipates the GSP 5 stock level under the proposed TACs and TACCs of either the AMP or LKB frameworks are likely to remain sustainable over the long-term.

49 Options 1 and 2 seek to address the problems that have been associated with mis-reporting in the fishing years prior to introduction to the QMS, using the LKB framework. The benefit of both options is to generate sufficient ACE to enable fishers to balance catches without the need to undertake the additional research programme. Option 1 increases the TACC to the same level as the proposed AMP proposal, while Option 2 provides a larger TACC increase to reflect average catch in the last four fishing years. Both options adjust the TACC to reflect a level of catch that likely existed prior to the introduction of pale ghost shark into the QMS, and is, thereby, unlikely to lead to an increase in overall exploitation rate nor increased sustainability risk to the stock.

50 Given the GSP 5 fishery is primarily a bycatch fishery, Option 2 would provide industry with greater flexibility to manage changes in abundance of the target and bycatch stock over time. For this reason, MFish does not anticipate that the TACC would be taken in every year. A reduction in fishing effort in the associated HOK 1 fishery may lead to a corresponding reduction in pale ghost shark catches.

51 The costs on industry under Options 2 and 3 would be less than the proposed AMP because there is no obligation for fishers to implement the proposed supporting research programme. The performance of the fishery appears to be satisfactorily assessed using the existing summer sub-Antarctic trawl survey series and monitoring of the fishery would continue using relative biomass and biological information from this annual trawl survey.

52 Although there is no obligation for the research programme to proceed under the LKB framework, industry would be encouraged to collect supplementary information to improve the knowledge of the fishery under a higher catch level.

53 Option 3 sets a TACC equivalent to Option 1, but using the AMP framework. The benefit of the proposed TACC is to generate sufficient ACE to enable fishers to

balance catches, while the supporting AMP programme will collect supplementary stock assessment information to better assess the performance of the fishery under a higher commercial catch level. The facilitation of collective agreements under an AMP framework is also a useful precursor to development of fisheries plans. The proposed AMP, however, will impose additional costs on the industry to implement and support the proposed research programme. Given the performance of the fishery appears to be satisfactorily monitored by the existing annual summer sub-Antarctic trawl survey series, the value of the proposed research programme is uncertain. Nevertheless, MFish considers the TACC increase under the proposed AMP meets the requirements for inclusion of the stock under the AMP framework.

54 MFish has considered the risk of fishing to the GSP 5 stock under both proposed TACC levels (ie, 401 tonnes and 454 tonnes). While the Plenary has only considered the lower TACC option (due to the receipt of the AMP proposal), MFish considers the higher TACC option, based on recent average catch levels, is unlikely to impose any additional risk to the fishery. Reporting is likely to have improved since introduction of GSP 5 to the QMS, and the proposed TACC probably reflects catch levels prior to QMS introduction. The sub-Antarctic trawl survey indices suggest that fishing at current levels has not had an adverse effect of the stock.

55 MFish supports Option 2 to set the TACC under the LKB framework. MFish considers that a TACC that reflects current catch levels will better enable fishers to balance catches without the need to pay deemed value penalties in most years. The potential adjustment to the TACC in the HOK 1 fishery may reduce catch of pale ghost shark. Increasing the TACC under Option 2 is appropriate as it meets the purpose of the Act to provide for the efficient utilisation of GSP 5 and its associated target fisheries. The approach will enable fishers to balance catches under current catch levels without imposing unnecessary costs on the industry to support the additional research under the AMP.

56 MFish considers the proposed TACC under Option 2 will have a negligible impact on non-commercial interests.

Future Management

57 Under Options 1 and 2, a review of the performance of the fishery under the LBK framework would be conducted in 2008. The proposed AMP under Option 3 would run for five years (beginning 1 October 2004) with a review of all fishery information in 2007. SEFML would monitor the fishery each year and report back to the plenary in 2007 and 2010. A summary of proposed management actions for GSP 5 under the proposed AMP and LKB frameworks is shown in Table 2.

Table 2: Proposed management actions under the AMP and Low-Knowledge Bycatch frameworks

	Initial assessment	Monitoring	Program review	Trigger points	Outcome
LKB		Existing Sub-Antarctic trawl GSP 5 indices and biological data. Catch information.	2008	Review all information	Review TAC, TACC and allowances
AMP	2007	Existing Sub-Antarctic trawl GSP 5 indices and biological data. Catch information. New bycatch CPUE indices of hoki target trawl fishery.	2010	Review all information	Review TAC, TACC and allowances

58 MFish will be undertaking further surveys to determine the levels of recreational catch (including GSP 5) over the next five years, and revised estimates of customary Mäori catch might also be available from reporting under the Fisheries (South Island Customary Fishing) Regulations 1999.

Conclusion

59 SEFML has proposed that the TACC for GSP 5 be increased from 118 tonnes to 401 tonnes under a five-year AMP.

60 Both SEFML and the Plenary note the estimated catches on which the original TACC of 118 tonnes was based are likely to have been much lower than actual catches due to mis-reporting of dark and pale ghost shark. The Plenary conclude, from the summer sub-Antarctic trawl survey indices and biological information, that stock abundance appears stable or increasing at current catch levels.

61 The Plenary has concluded that the GSP 5 biomass is likely to be above the size that will support the MSY. The Plenary also considers that, on balance, the TAC and TACC, at the levels proposed in the AMP, are likely to allow the stock to move towards a size that will support the MSY or remain at, or above, the level that will support the MSY over the next five years.

62 MFish considers the GSP 5 fishery meets the criteria for consideration under both the LKB and AMP frameworks. The IPP proposes three options to increase the TACC for the GSP 5 fishery. Option 1 proposes to set the TACC at 401 tonnes under the LKB framework to reflect the AMP proposal. Option 2 proposes to set the TACC at 454 tonnes under the LKB framework to reflect average catches in the past four fishing years. Option 3 proposes to set the TACC at 401 tonnes under the AMP framework. There is no obligation for fishers to implement and support the proposed research programme under Options 1 and 2.

63 The costs on industry under the LKB framework would be less because there is no obligation to analyse GSP 5 bycatch CPUE from the bottom trawl fishery for hoki. However, the ability to monitor the effect of a higher TAC and TACC on stock status would be less than under an AMP if this supplementary information was not gathered. Monitoring of the fishery would continue using relative biomass indices (and biological information) derived from the summer sub-Antarctic trawl survey.

This survey provides a satisfactory fishery-independent indicator of relative abundance to monitor stock performance under a higher catch level.

64 MFish has considered the risk of fishing to the GSP 5 stock under both proposed TACC levels (ie, 401 tonnes and 454 tonnes). MFish considers the higher TACC option, based on recent average catch levels, is unlikely to impose any additional risk to the fishery, as it probably reflects catch levels prior to QMS introduction. The sub-Antarctic trawl survey indices suggest that fishing at current levels has not had an adverse effect of the stock.

65 MFish supports Option 2 to increase the TACC to 454 tonnes under the LKB framework. This approach is appropriate as it meets the purpose of the Act to provide for the efficient utilisation of GSP 5, and its associated target fisheries, without imposing unnecessary costs on the industry to support the additional research under the AMP. The proposed TACC reflects current catch levels and will better enable fishers to balance catches without the need to pay deemed value penalties in most years.

66 No significant concerns have been identified regarding other statutory considerations that affect the setting of a TAC and TACC and allowances for GSP 5.

Preliminary Recommendations

67 MFish proposes to include GSP 5 under the Low Knowledge Bycatch framework that will:

a) set the TAC at 477 tonnes;

b) make an allowance of 23 tonnes for other sources of fishing-related mortality;

c) retain the allowance of zero tonnes for customary Mäori interests and zero tonnes for recreational interests;

d) increase the TACC from 118 tonnes to 454 tonnes; and

e) review the performance of the fishery under the proposed TAC in 2008.

ANNEX ONE

Statutory Considerations

68 In forming management options, the following statutory considerations have been taken into account.

TAC

69 The purpose of the Act (as provided in s 8) is to provide for utilisation of fisheries resources while ensuring sustainability. The proposed AMP and LKB options for GSP 5 seek to increase the TACC to enable fishers to balance catches at current catch levels. The current TACC of 118 tonnes is 285% less than the 454 tonne average annual catch of the past four fishing years. The TACC presently inhibits the efficient utilisation of the GSP 5 resource and the associated fisheries. A TACC increase under the AMP or LKB frameworks is consistent with the purpose of the Act to provide for better utilisation of the fishery, in light of increased biomass, while ensuring catch levels remain sustainable. As such, the proposed TAC, TACC, and allowances would enable people to provide better for their social, cultural and economic well-being.

70 The TAC set under s 13(2) of the Act should be set at a level that moves the stock towards a level that can produce the MSY. That level is currently unknown for GSP 5, although the Plenary agree that the biomass (although unknown) is likely to be above the level that will support the MSY. As such, it may be difficult to assess the fishery in relation to MSY at any one time. Nevertheless, the Plenary note historical catch was under-reported and the sub-Antarctic trawl surveys indicate the stock appears stable or increasing at reported current catch levels.

71 Both the AMP and LKB framework proposals for GSP 5 are intended to provide a structured and monitored way to determine if current catch levels are sustainable. The proposed TACC increase under the AMP framework is supported by a research programme to monitor stock status under a higher TACC by monitoring CPUE information from the target trawl fishery for hoki (including development of new stock abundance indices) and will provide a better stock assessment of the fishery. The increased TAC, TACC, and allowances would provide for the GSP 5 fishery to operate at current catch levels with a significantly reduced need to pay deemed value penalties.

Environmental

72 The proposed TAC options are also based on:

a) GSP 5 does not appear to be prone to significant fluctuations in biomass from year to year as stock abundance appears stable or increasing at current catch levels. MFish considers it is not necessary to take into account natural variability when setting or varying the TAC/TACC or other allowances (s 11 (1) c);

b) The Plenary note that catch of GSP 5 is taken as a bycatch of the hoki target fishery. MFish consider there would be no additional environmental impacts

associated with GSP 5 bycatch as no increase in actual catch is proposed under either the AMP or LKB frameworks; and

c) There are no known interactions between the existing GSP 5 fishery and non-harvested species that are of concern or specific to the fishery under current catch levels. GSP 5 is usually processed at sea to the dressed state. The fishery does not generate any significant amount of fish waste or offal at sea as it is usually processed into fishmeal on board the fishing vessel, so the potential for interactions with seabirds is not significant. The draft Seabird Interaction with Fisheries in the New Zealand Exclusive Economic Zone - A Review and National Plan of Action 2000 document does not list pale ghost shark as one of the fisheries with seabird interactions that are of concern.

73 The Act also requires (s 9(b)) that the biological diversity of the aquatic environment should be maintained. There are no known impacts on biodiversity that would be specific to the GSP 5 as a bycatch fishery at current catch levels.

74 Section 9(c) of the Act requires that habitats of particular significance to fisheries management should be protected. MFish notes the proposed TACC increase is largely intended to cover existing catch and, therefore, the proposal will have no further implications for any habitats of particular significance to fisheries.

Allocation

75 Increasing the GSP 5 TAC will have economic benefits in the short term, but longer-term benefits will be dependent on stock status. A higher TACC would enable fishers to balance catches against ACE and reduce the need to pay deemed value penalties. Increasing the TACC under the LKB framework provides potential for greater economic benefits. MFish does not anticipate that either option would create any anticipated social, economic or cultural issues for other sectors (s 13 (3)).

Other statutory considerations

76 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks, and the maintenance of biodiversity). There are no international obligations specific to GSP 5. MFish considers issues arising under the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for GSP 5 (s 5 (a) & (b)).

77 Section 11(1)(b) provides that the Minister must take into account existing controls when setting or varying a sustainability measure such as a TAC. The GSP 5 fishery is mostly commercially fished using the trawl method. Apart from the existing TAC, TACC, and allowances, the other important existing fisheries management control under the 1996 Act for GSP 5 is the minimum fishing net mesh size restriction.

78 A fishery plan has not been developed or approved for GSP 5 (s 11(2A)(b)).

79 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 the proposal will affect existing or proposed fisheries services, nor any additional conservation service requirements (s 11(2A)(a & c)).

80 Before setting or varying any sustainability measure for GSP 5, the Minister must take into account any provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991 or any management strategy or plan under the Conservation Act 1987.

81 Conservation strategies identify a number of issues of significance to GSP 5 including advocating for the sustainable use of marine fisheries and promoting the protection of significant marine ecosystems from the adverse effects of fishing practices.

82 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 that are relevant to the setting proposed TACC increase (s 11(2)(b).

83 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. Taiäpure or mätaitai reserves do not exist in the GSP 5 QMA.

84 No restrictions have been placed on fishing in any area within the QMA for recreational interests using the provisions in s 311 (s 21(1)(a &b), 4(i & ii), 5).

85 The information principles of the Act require that decisions be based on the best available information, take into account any uncertainty in that information, and are cautious 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 (s 10).

86 MFish considers that the AMP proposal and plenary information used to evaluate the GSP 5 proposals is the best available. While it is recognised that the current status of the stock is uncertain, the research and monitoring criteria for the proposal will allow for improved information to be obtained. MFish does not believe that the uncertainty about the stock status is a reason to prevent the Minister from approving the LKB or AMP TACC proposal and associated TAC.

ANNEX TWO

Biological Characteristics

87 Pale ghost sharks occur throughout the Exclusive Economic Zone and are most abundant in water depths of 400–1 000 m off the Chatham Rise and Southland/Sub-Antarctic waters. Pale ghost sharks are uncommon north of latitude 40 S.

88 Little is known regarding the life cycle, migratory habits, fecundity, or longevity of pale ghost shark. There is no published information on growth rate or age of pale ghost shark. Length-frequency histograms indicate that females are larger and are likely to have a faster growth rate than males.

89 Size at 50 % sexual maturity for pale ghost shark in GSP 5 is approximately 60 cm for males and 70 cm for females. Population age structure data or estimates of longevity are not available to estimate natural mortality.

90 Stomach contents indicate that pale ghost sharks are predominately bottom feeders.

Catch Information

Commercial fisheries

91 Approximately 90–95% of the annual catch of pale ghost sharks in GSP 5 is taken as bycatch of targeted bottom trawling, 1–2% by targeted midwater trawling, and 4–8% taken by bottom longline fishing.

92 The majority of pale ghost sharks in GSP 5 are taken from waters around the Auckland Islands, Campbell Island and south of Stewart Island.

93 The GSP 5 fishery was introduced into the QMS in 1999 at which time the quota was set at 118 tonnes. Since entry in QMS, the TACC has been exceeded each fishing year. In the most recent fishing year for which data are available (2002-03), the catch exceeded TACC by 410%.

Table 3: **Reported landings (tonnes) and TACCs (tonnes) of pale ghost sharks from GSP 5 from 1989-90 to 2002-03.**

Year	Landings (tonnes)	TACC (tonnes)
1989–90	46	-
1990–91	143	-
1991–92	118	-
1992–93	132	-
1993–94	68	-
1994–95	53	-
1995–96	59	-
1996–97	98	-
1997–98	88	-
1998–99	74	-
1999–00	216	118
2000–01	454	118
2001-02	545	118
2002-03	602	118

94 Further commercial catch information can be found in the *GSP 5 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 24 November 2003, produced by the South East Finfish Management Limited. This document can be viewed on the Ministry of Fisheries website at: <http://www.fish.govt.nz/sustainability/research/assessment/index.html>[3]. Under '2003 Working Group Documents', the required document is listed as 'GSP 5 AMP Proposal'.

Mäori customary fisheries

95 Quantitative information is not available on the level of customary Mäori catch, although it is likely to be negligible.

Recreational fisheries

96 Recreational fishing surveys do not provide recreational harvest estimates for pale ghost shark. The recreational catch is considered to be negligible due to the offshore and deepwater habitat of this species.

Other sources of fishing-related mortality

97 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality of GSP 5. Since most of the catch is taken by bottom trawl gear, there will be some mortality associated with pale ghost sharks that escape through the net, but are fatally injured. No minimum legal size applies to pale ghost sharks.

[3] You will be asked for a username and a password. The username is: workinggroup; the password is: bluenose.

Existing controls

98 In addition to the TACC of 118 tonnes, fishers are required to use nets with a mean mesh size of 100 mm except:

a) in the Southland FMA south of 48 S a trawl net with a mean mesh size of 60 mm may be used from 01 January to 31 May; and

b) in the sub-Antarctic FMA, a trawl net with a mean mesh size of 60 mm may be used at anytime.

99 There is no amateur daily bag limit for GSP 5.

Social, cultural and economic factors

100 GSP 5 quota was being traded at $480 per tonne (as at 30 September 2003), with ACE traded at $50 per tonne. There were 17 quota owners in the fishery and 25 ACE holders, with ACE holdings ranging from 12 holders with less than 0.5 tonnes each to four holders with 10–50 tonnes each. The port price was $480 per tonne, so that the 283 tonne increase in the TACC under the proposed AMP is valued at $135 840 domestically, without taking any account of export value.

Research plan

101 There are no research projects that specifically relate to the GSP 5 fishery, apart from the annual sub-Antarctic trawl survey.

Stock Assessment Information

102 The 2003 AMP plenary evaluated the stock assessment criteria, decision-rules, and monitoring programme of the SEFML's AMP proposal as part of the review required for proposed AMP fishstocks. The plenary report for GSP 5 follows:

Stock assessment criteria

103 The Plenary made the following conclusions regarding GSP 5:

a) The biomass is likely to be above the size that will support the MSY. The inclusion of this fishstock in the AMP was justified under the following 'New AMP' criteria for 'Existing/Established' fisheries:

b) The stock size is uncertain, but the available information and analyses suggest that:

i) there is a reasonable probability that current biomass is greater than the size that will support the MSY;

ii) on balance, the new TACC and TAC level are likely to allow the stock to move towards a size that will support the MSY, or remain at or above the level that will support the MSY over the five year period of the programme; and

iii) stock abundance appears stable or increasing at current (actual) catch levels.

Monitoring criteria

104 The sub-Antarctic trawl survey provides a good monitoring tool for the pale ghost shark and biological data will continue to be collected in these surveys. The survey covers the main areas where the fishery is concentrated. Length frequency and sex ratio information collected during the trawl survey show consistent patterns in the data.

Decision rule criteria

105 A decision rule to review all information in 2007 after two years operation of the AMP was agreed.

Environmental considerations

106 The catch is taken as bycatch of the hoki target fishery. No increase in actual catch is likely and no associated impacts of fishing are known.

Future review

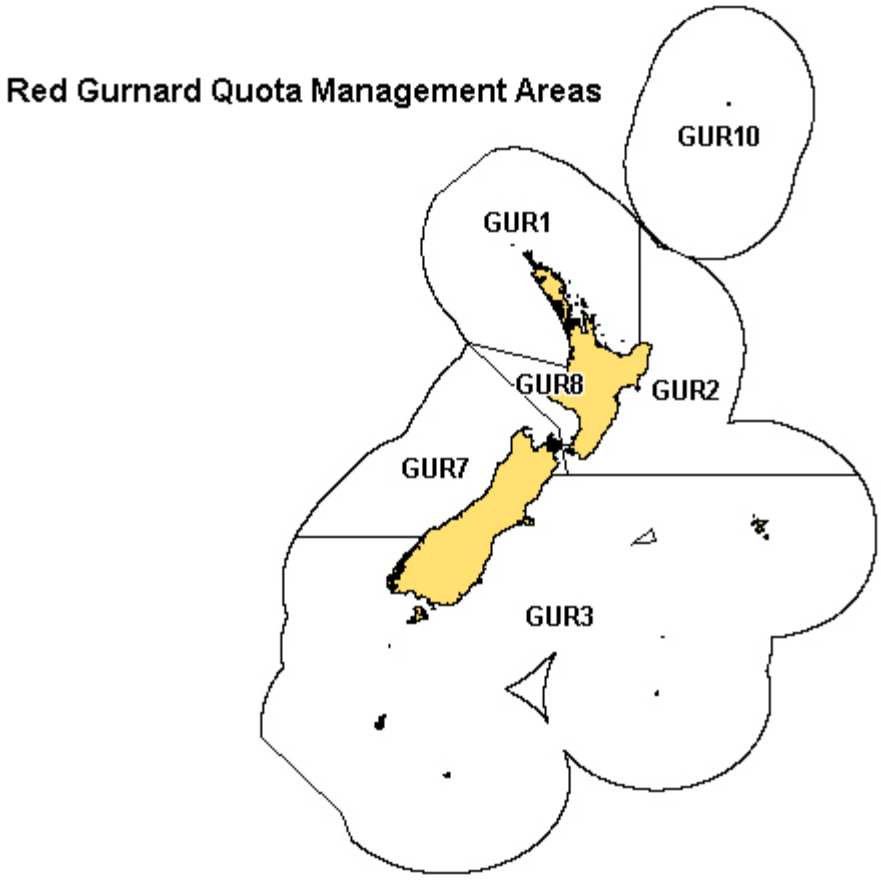
107 Review after two years in the AMP.

Conclusions

108 The Plenary agreed that GSP 5 could be considered for inclusion in the AMP. The trawl survey series suggests that previous catch levels have had no impact on the biomass of pale ghost shark, however the actual level of catch is not known. The recorded catch history for this species is likely to underestimate actual catches. A revised catch history could be reconstructed based on assumptions concerning bycatch rates in the hoki fishery.

RED GURNARD (GUR 7) AMP PROPOSAL – INITIAL POSITION PAPER

Figure 1: Map showing boundaries of GUR 7



Key Issues to be Considered

1 The key issues to be considered for the proposed red gurnard (GUR 7) Adaptive Management Programme (AMP) are:

a) MFish has received a proposal from the Challenger Finfisheries Management Company Limited (Challenger FMC) to increase the Total Allowable Commercial Catch (TACC) by 25% from 680.86 tonnes to 848 tonnes under a five-year AMP;

b) Red gurnard are primarily taken as a bycatch in the target barracouta and flatfish bottom trawl fisheries. Reported commercial catches have increased since 2000-01 and exceeded the TACC by 16% in the last fishing year (2002-03);

c) The recent overcatch of red gurnard has led to deemed value penalties for some fishers due to insufficient annual catch entitlement (ACE) to balance catches. This has caused some vessels to move away from productive grounds for the associated target fisheries to avoid catching red gurnard;

d) The proposed AMP seeks to address problems in balancing red gurnard catches by setting a TACC that reflects increasing catch levels;

e) Commercial catch rates have increased since 1997-98, particularly along the west coast. However, the west coast South Island trawl survey index suggests that relative abundance has significantly declined (60%) since 2000, particularly in Golden and Tasman Bays. In addition, the absence of juveniles in the 2003 survey raises concerns;

f) It is not known whether GUR 7 is at, above or below the $B_{MSY.}$ It is also not known whether the proposed TACC would allow the stock to move towards the B_{MSY}, or if stock abundance is stable or increasing under current catch levels. On this basis, a TACC adjustment for GUR 7 cannot be considered under the AMP framework; and

g) GUR 7 cannot be considered for a TACC adjustment under the Low Knowledge Bycatch framework, as commercial catches have not exceeded the TACC by 20% in past three fishing years.

Management Options

2 The proposed management programme, TAC, TACC, and allowances for GUR 7 are presented in Table 1.

Table 1: Proposed management framework, TAC, TACC and allowances (tonnes) for GUR 7

Programme	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC	%TACC increase
Retain TACC	724.86	10	20	14	680.86	0%
Adaptive Management Programme	895	10	20	17	848	25%

3 The Challenger FMC proposes to establish an AMP for GUR 7 for five years beginning 1 October 2004 that will:

a) Increase the TACC from 680.86 tonnes to 848 tonnes (25% increase); and

b) Implement a research programme to provide additional stock assessment information to monitor the performance of the fishery under a higher TACC level.

4 An alternative option is to retain the TACC at 860.86 tonnes.

AMP and Low Knowledge TAC and Allowance Options

TAC

5 A TAC of 758 tonnes and a TACC of 680.85 tonnes[4] has been set for GUR 7 under s 13 of the Fisheries Act 1996 (the Act). Within the TAC, the following allowances have been made:

[4] A TACC of 678 tonnes was set in 1997, and increased to 680.86 tonnes in October 2001 as a result of a

- 60 tonnes for customary Mäori interests; and
- 20 tonnes for recreational interests

6 Section 13 requires the stock to be maintained at, or moved towards, a level that can produce the maximum sustainable yield (MSY). MFish is proposing to retain the GUR 7 fishery under s 13 because the biological characteristics of red gurnard allow the MSY to be estimated, the fishery is not part of any international agreement, and is not managed on a rotational or enhanced basis. The stock does not meet the criteria for consideration under the alternative options for setting sustainability measures provided by s 14.

Characteristics of GUR 7 fishery

7 GUR 7 is a valuable commercial species and is primarily taken as bycatch in the inshore bottom trawl fishery when targeting flatfish (approx. 60% of total catch) and barracouta (approx. 18% of total catch). Although little targeting for red gurnard has occurred in the past, there has been an increase in target catches over the last two fishing years (approx. 12% of total catch). The majority of red gurnard are caught in Golden and Tasman Bays, and along the west coast.

8 The GUR 7 fishery was managed under an AMP with a TACC of 815 tonnes between 1991-92 and 1997-98. At the completion of the AMP, the stock was considered to have a satisfactory monitoring programme, but it was unknown whether the TACC was sustainable. At that time, there had been a substantial decline in the commercial CPUE indices, while the west coast South Island trawl survey abundance index remained stable. The stock was removed from the AMP and the TACC reduced to 678 tonnes (the amount of the AMP increase). The TACC was later increased to 860.86 tonnes in October 2001 as a result of a decision under s 362 of the Act.

9 Although commercial catches declined steadily between 1991-92 and 1999-00, there has been a marked increase in catches in the last three fishing years (refer to Table 2). Catches have exceeded the TACC for the first time by about 1% and 16% during the 2001-02 and 2002-03 fishing years, respectively.

decision under s 362 of the Fisheries Act 1996.

Table 2: GUR 7 landings (tonnes) and TACCs (tonnes) since the 1983-84 fishing year

Fishing Year	Landings	TACC	Fishing Year	Landings	TACC
1983-84*	468	–	1993-94†	469	815
1984-85*	332	–	1994-95†	455	815
1985-86*	239	–	1995-96†	382	815
1986-87†	421	610	1996-97†	378	815
1987-88†	806	629	1997-98†	309	678
1988-89†	479	669	1998-99†	323	678
1989-90†	511	678	1999-00†	331	678
1990-91†	442	678	2000-01†	571	678
1991-92†	704	815	2001-02†	686	680.86
1992-93†	761	815	2002-03†	787	680.86

* FSU data.
† QMS data.

10 The recent increase in commercial catch levels corresponds with an increase in unstandardised CPUE over the past five years. The mean estimated CPUE increased from 12 kg per tow in 1996-97 to 44 kg per tow in 2001-02. The increase in CPUE is particularly evident for catches along the west coast. An increase in catch rates is supported by anecdotal information from several commercial operators of increasing red gurnard abundance.

11 The reason for the recent trend of increasing catch rates is unclear. Increased catch rates may be explained by the increase in the proportion of red gurnard catches reported by large vessels (20-40 m) in the past four to five years. The increase in large vessel catch may be positively biasing the overall CPUE data, as these more powerful vessels are likely to be more efficient in catching red gurnard off the west coast. The extent of the increase in vessel length has not been examined, so it is unclear how significant this factor is. However, as the increase in CPUE is observed to a lesser extent across all vessel sizes, other factors may contribute to the trend of increasing catch rates, including increased red gurnard biomass. Further analysis using standardised CPUE data is required to determine the effect of recent changes in fleet composition to better explain the recent trend of increasing CPUE.

Rationale for TAC/TACC increase

12 The recent increase in catch levels has had a negative economic effect on the industry. This increase has resulted in some fishers paying deemed value[5] penalties for catches in excess of ACE holdings, and has caused fishers to move away from productive grounds for the associated target species in an attempt to avoid red gurnard bycatch. As such, the TACC presently constrains the ability for some fishers to efficiently harvest the associated target fisheries given the difficultly in balancing red gurnard catches with ACE. In addition, the TACC prevents fishers from taking advantage of an increase in red gurnard biomass, and thereby constraining efficient utilisation.

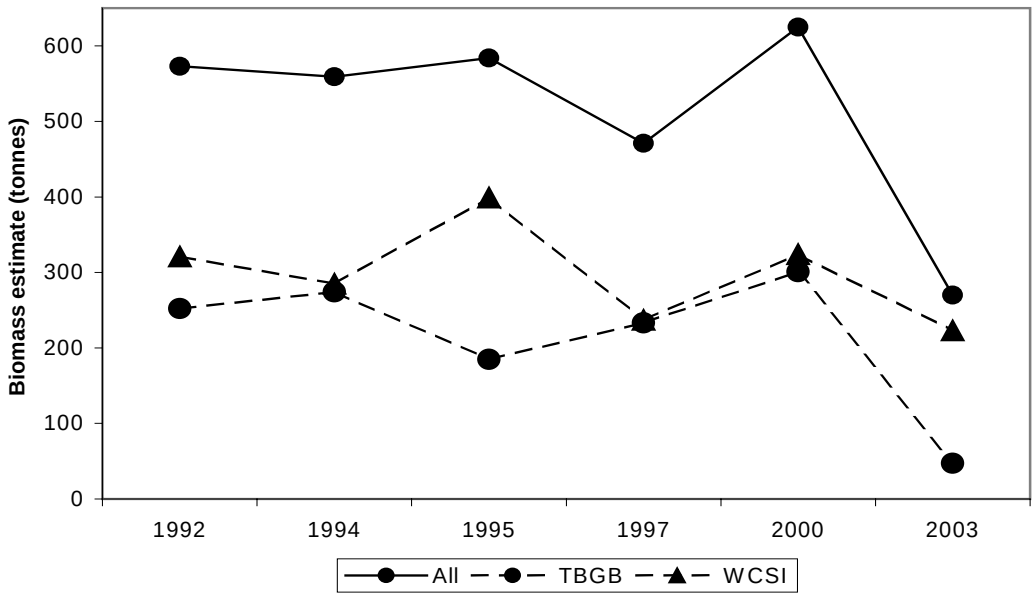
13 The performance of the GUR 7 fishery is largely monitored by the west coast South Island trawl survey programme (by the *RV Kaharoa*). There have been six surveys since 1992 to provide a time series of relative abundance indices. The index is considered to provide a satisfactory fisheries-independent method to monitor the relative abundance of red gurnard over time, and this is demonstrated by the relatively

[5] GUR 7 has an Interim Deemed Value of $0.43/kg and an Annual Deemed Value of $0.85/kg. The current port price for GUR 7 is $1.40/kg.

low coefficient of variation (c.v.) associated with each indice (ie, 12-20%). The next trawl survey is planned for early 2005.

14 The recent increase in unstandardised CPUE is not supported by the trawl survey index. Relative abundance in all survey areas was generally consistent between 1992 and 2000, but declined by 60% in 2003 (refer Figure 1). The decline in biomass comprised of an 85% reduction in Golden and Tasman Bays, and a 30% reduction along the west coast.

Figure 1: Overall biomass estimates (tonnes) for red gurnard from the west coast South Island trawl series (All = all survey strata, TBGB = Tasman and Golden Bays, WCSI – west coast South Island)



15 The decline in relative abundance in Golden and Tasman Bays in the 2003 survey corresponds with a large reduction in the proportion of small fish (<25 cm) compared with previous surveys. The reduction in juvenile fish is of concern for recruitment for the next few years, particularly as the commercial fishery is based only on few year classes. It is unclear why the decline in juvenile fish in the 2003 survey has occurred, but is inconsistent with commercial catch information.

16 The validity of the 2003 survey information to provide a reliable indicator of stock abundance is uncertain given the recent increase in both commercial catches and unstandardised CPUE data. Because the same vessel and trawl method is used for each survey, the results should be comparable between years. Certainly, the coefficient of variations for all surveys have remained low, and this should provide some level of confidence on the ability of the trawl survey index to monitor the status of the GUR 7 fishery.

17 Nevertheless, there is the possibility that the 2003 survey information under-estimates the current state of the fishery. One explanation could be a reduction in the efficiency of the trawl (sampling) gear that would reduce catch rates of bottom-dwelling species. Reduced trawl efficiency could be caused by the failure for the trawl gear to maintain contact with the seabed, however there is no direct evidence that gear performance was lower in the 2003 survey. Another explanation is a temporal disappearance of

red gurnard from the survey area. The report for the 2003 survey highlights that catches of all species from Golden and Tasman Bays, and biomass estimates for most benthic species were noticeably lower than previous years. The report notes that lower catches in 2003 may be attributed to higher sea surface and bottom temperatures within the survey area at the time of sampling.

18 The Challenger FMC has provided additional commercial catch and effort information to suggest the 2003 trawl survey does not reflect the state of the fishery. Both CPUE and the proportion of total catch from Golden and Tasman Bays was high at the time the trawl survey was undertaken. While the additional information has yet to be considered by the Inshore Stock Assessment Working Group, it does raise further concerns about the validity of the 2003 trawl survey.

19 The inconsistencies between the updated unstandardised CPUE and trawl survey data are similar to the differences between fishing and trawl survey information observed in 1997. At that time, CPUE had substantially declined while the trawl abundance index remained stable. In addition, age frequency data from the trawl survey showed strong age year classes and was considered inconsistent with a high level of exploitation to produce a decline in CPUE. Both MFish and the industry agreed catch levels and CPUE could be influenced by spatial and vessel changes in the associated target fisheries and did not reflect changes in abundance in the GUR 7 fishery. Consequently, the trawl survey index was considered to provide a satisfactory indicator of stock abundance.

Impact on interests of one or more fishing sectors

20 There is potential for increased commercial catches under a higher TACC to affect the size and availability of red gurnard for non-commercial interests. The nature and extent of any effect would depend on the (unknown) current status of the stock. However, MFish is not aware that current catch levels are having an undue effect on the non-commercial fishery, as recreational fishers have not raised concerns about their ability to catch red gurnard.

Recreational allowance

21 Red gurnard are an important species for recreational fishing interests, by virtue of its wide distribution in shallow coastal waters.

22 The TAC includes an allowance of 20 tonnes for recreational interests. This allowance is based on the 1992-93 National Marine Recreational Fishing Survey that estimated an annual recreational harvest for GUR 7 of 5-20 tonnes. The 1999-00 National Marine Recreational Fishing Survey provides a new estimate of annual recreational harvest of 8.5-13.5 tonnes (23% c.v.). MFish considers it appropriate to retain the current allowance of 20 tonnes despite a lower annual harvest estimate reported in the most recent survey. The current allowance reflects a general increase in recreational fishing effort within the top of the South Island, and the expected increase in harvest of common inshore fish species (including red gurnard) in response to recent restrictions in the local blue cod fishery.

23 While considering the allowance for recreational interests, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which

regulations have been made pursuant to s 311 of the Act (s 21(5)). No such regulations have been made.

Customary Mäori allowance

24 Red gurnard are considered to be of medium importance to Mäori and there is no known level of customary catch.

25 The current TAC for GUR 7 includes an allowance of 60 tonnes for customary interests and is based on 10% of the TACC. This allowance should be adjusted in line with the current guidelines to setting a customary allowance within a TAC. These guidelines set a customary allowance based on 50% of the proposed recreational allowance where a species is not considered to be of importance to Mäori. Accordingly, MFish proposes to adjust the allowance for customary interests to 10 tonnes. MFish does not anticipate the proposed allowance to have any undue affect on customary interests, as red gurnard are not an important kaimoana species for customary purposes.

26 In considering the proposed allowance for customary non-commercial interests, the Minister is required to take into account any mätaitai reserve or s 186A closure in the relevant QMA (s 21(4) of the Act). No such management measures are in place within the GUR 7 fishery.

Other sources of mortality

27 The TAC does not presently include an allowance for other sources of fishing-related mortality.

28 No quantitative information is available on the level of illegal catch or other sources of mortality. It is possible that some commercial fishers who do not hold sufficient ACE to cover any bycatch discard red gurnard to avoid deemed value penalties. It is also likely that some indirect fishing-mortality will occur through the escapement of fish from nets.

29 MFish considers it appropriate to include an allowance for other sources of fishing-related mortality for GUR 7 based on 2% of the TACC. Accordingly, MFish proposes to include an allowance of 14 tonnes for other sources of fishing-related mortality within the TAC.

TACC

AMP option:

30 The Challenger FMC has proposed to address the current problems within the GUR 7 fishery by increasing the TACC by 25% to 848 tonnes under the AMP framework. The effect of the proposed TACC is the generation of additional ACE to enable fishers to balance red gurnard catches.

31 The proposed AMP incorporates a supporting research programme to provide additional stock assessment information to monitor stock status under a higher commercial catch level. The main objectives of the AMP are to determine the size,

geographical extent, and long-term sustainable yield of the GUR 7 stock. Specifically, the research programme will include:

a) New CPUE indices from the BAR 7 and FLA 7 target fisheries. MFish catch and effort data will be supplemented by more detailed information collected through a voluntary logbook programme in the QMA bottom trawl fishery. The proposed logbook programme will be the same as the guidelines already specified by the Challenger FMC for current AMP fisheries; and

b) The continued use of biological data collected from the existing trawl survey and shed sampling programmes. Commercial fishers will randomly tag and release some fish to collect supplementary biological information.

32 The AMP framework contains guidelines (criteria) to assess a stock's suitability for a TACC adjustment. In respect to 'existing/established fisheries', the framework specifies the following three criteria:

a) There is a reasonable probability that the current biomass is greater than the size that will support B_{MSY};

b) On balance, the proposed increase in TACC is likely to allow the stock to move towards B_{MSY}; and

c) Stock abundance appears to be stable or increasing under current catch levels.

33 The 2003 Plenary has reviewed the GUR 7 stock and the AMP proposal against the above three criteria. The Plenary, after considering the updated analysis of the unstandardised CPUE and trawl survey index, was "*unable to conclude*" that the fishery satisfied these three criteria. This position was primarily made on the basis of conflicting information from the unstandardised CPUE and trawl survey information.

34 Given the Plenary's position, MFish considers the proposal from the Challenger FMC to increase the TACC under the AMP framework cannot be accepted at this time.

Low knowledge bycatch framework option:

35 An adjustment to the TACC for a stock under the Low Knowledge Bycatch framework can be considered provided it meets the following five criteria:

- The fishery is primarily a bycatch fishery;
- There is no stock assessment information to determine an appropriate sustainable yield;
- There are no known sustainability concerns under current catch levels;
- Catch exceed the TACC by 20% for at least the last three fishing years; and
- There has been no TACC increase for at least three years.

36 Commercial catches in the GUR 7 fishery have exceeded the TACC in the last two fishing years (ie, 1% in 2001-02 and 16% in 2002-03). However, these catches are less than the required 20% threshold. Accordingly, the stock does not meet all of the required five criteria.

37 The guidelines to assess the inclusion of stocks under the Low Knowledge Bycatch framework acknowledge that the overcatch criteria may prevent the inclusion of some stocks, particularly in light of the implementation of the ACE balancing regime in 2001. However, the guidelines note that if a shorter time period is adopted, there are increased sustainability risks to the stock due to possible environmental perturbations, and short-term changes in fishing effort or market conditions that would drive TACC adjustments under this framework. Adopting a shorter time period would also provide incentives for fishers to overcatch in the short-term to seek an increase to the TACC.

38 On the basis the GUR 7 fishery does not meet all five criteria (ie, overcatch threshold), the stock is unable to be considered for a TACC adjustment under the Low Knowledge Bycatch framework.

Analysis of options

39 MFish considers that the GUR 7 fishery does not qualify for inclusion under both the AMP and Low Knowledge Bycatch options at this time, as it does not meet key criteria for each framework. However, it is appropriate to retain the current TACC in light of the conflicting information about stock status. While the 2003 trawl survey suggests a decline in red gurnard abundance, catches appear to be sustainable in the short-term at current catch levels. Given the uncertainty on whether the 2003 trawl survey provides an accurate representation of current stock status, the dramatic decline in catch rates in the 2003 survey and the need for further CPUE analysis suggests a need for caution at this time. As such, there are insufficient grounds to increase the TACC, as the ability of the stock to remain sustainable under a higher commercial catch level is uncertain.

40 A further review of the GUR 7 fishery is warranted once the results from the proposed 2005 trawl survey are available. This survey will be important to validate the 2003 survey information and determine whether a decline in abundance is real. The review would also provide additional time to determine whether the recent increase in commercial catches will continue to be a problem or is a short-term event. Industry may wish to consider a new AMP proposal at this time, and this would be reviewed in light of the updated CPUE (including further CPUE analysis) and trawl survey information.

Future Management

41 If approved, the proposed AMP programme for GUR 7 would run for five years beginning 1 October 2004. The Challenger FMC would be responsible for monitoring the fishery each year and to report back to the Plenary in March 2007 and 2010. Depending on the information obtained, it might be possible to undertake a formal stock assessment of GUR 7 at that time. A summary of proposed management actions under the proposed AMP framework is shown in Table 3.

Table 3: Proposed management actions under the AMP framework

	Initial assessment	Monitoring	Program review	Trigger points	Outcome
AMP	March 2007	• Existing CPUE indices • New CPUE indices for the target BAR 7 and FLA 7 fisheries • Existing west coast South Island trawl index • New voluntary logbook programme • Random at-sea tagging programme	March 2010	No decision rule proposed	Stock assessment

42 As already noted, it appropriate to retain the TACC at 680.86 tonnes given the uncertainty about the current status of the GUR 7 stock. It is proposed to again repeat the trawl survey in early 2005 and this would provide new information to assess the state of the fishery. MFish would consider a revised AMP proposal from industry once the 2005 information is available.

43 MFish will be undertaking further surveys to determine the levels of recreational catch (including GUR 7), and estimates of customary Mäori catch may become available under the Fisheries (South Island Customary Fishing) Regulations 1998.

Conclusion

44 The Challenger FMC has proposed to increase the TACC for GUR 7 from 680.86 tonnes to 848 tonnes under a five-year AMP.

45 The 2003 Plenary is unable to conclude whether current biomass is greater than the size that will support the MSY, or whether the proposed increase in TACC is likely to allow the stock to move towards the MSY. Further, the Plenary is unable to agree that biomass appears to be stable or increasing under current catch levels.

46 The Plenary's views arise because of conflicting information between commercial catch information and the 2003 trawl survey. While commercial catches and unstandardised CPUE have increased in recent years, the 2003 trawl indice demonstrated a substantial decline in relative abundance, particularly in Golden and Tasman Bays. Also of concern is a significant reduction in juvenile fish from the survey area. The trawl survey index is considered to provide a satisfactory method to monitor stock status, and the dramatic decline in 2003 suggests a precautionary approach is warranted. Given the Plenary's position, MFish considers the proposal to increase the TACC under the AMP framework cannot be accepted at this time.

47 GUR 7 fishery cannot be considered for a TACC adjustment under the Low Knowledge Bycatch framework, as it does not satisfy key criteria. Catches have not exceeded the TACC by 20% in the last three fishing years.

48 MFish proposes to retain the TACC at 680.86 tonnes and adjust the TAC to 724.86 tonnes. The TAC adjustment is considered necessary to reduce the allowance for customary interests from 60 tonnes to 10 tonnes to reflect current guidelines for

setting a customary allowance, and to include an allowance of 14 tonnes for other sources of fishing-related mortality.

49 It is appropriate to review the GUR 7 fishery in 2005 when new trawl survey information should be available. MFish invites industry to consider a revised AMP as part of this review.

50 The relevant statutory considerations have been taken into account in determining the proposed management options for GUR 7 (refer to Annex 2).

Preliminary Recommendations

51 MFish proposes to:

a) Decrease the TAC from 758 tonnes to 724.86 tonnes;

b) Make allowances of 10 tonnes for customary Mäori interests and 14 tonnes for other sources of fishing-related mortality;

c) Retain the allowance of 20 tonnes for recreational interests; and

d) Retain the TACC at 680.86 tonnes

ANNEX ONE

Biological Characteristics

52 Red gurnard are a common inshore species found throughout New Zealand. The species occurs at depths of 20-180 m, but are most commonly found on sandy and muddy substrates in less than 60 m. Diet comprises of mainly crustaceans, especially small crabs and shrimps.

53 Red gurnard have a long spawning period that extends through spring and summer with a peak in early summer. Spawning grounds appear to be widespread. Egg and larval development takes place in surface waters, and there is a period of at least 8 days before feeding starts. Small juveniles are often caught in shallow harbours, but rarely in commercial trawls.

54 Sexual maturity is usually attained at two to three years of age, and at a size of about 23 cm. Growth rates vary with location, and females grow faster and are usually larger than males. Maximum age is about 16 years and maximum size is about 55+ cm.

Catch Information

Commercial fisheries

55 Red gurnard are a major bycatch of inshore trawl fisheries in most areas of New Zealand. They are also targeted in some areas. Red gurnard are also taken by longline and set net.

56 The GUR 7 fishery is primarily a bycatch fishery in the inshore barracoura (BAR 7) and flatfish (FLA 7) bottom trawl fisheries (about 98% of total catch). Most catches are taken in Golden and Tasman Bays, and along the west coast of the South Island.

57 GUR 7 landings steadily declined between 1991-92 and 1999-00, but have shown a marked increase in the past three fishing years (ie, 2000-01 to 2002-03). Catches are generally highest in autumn and early winter, and lowest during summer. In the target red gurnard fishery catches have also increased in the last two fishing years.

58 The GUR 7 fleet is comprised of predominately small inshore trawl vessels 10-20 m in overall length. Between 1990-91 and 2000-01, these vessels contributed to about 78% of the total red gurnard catch. Since 2000-01, catch rates have increased consistently across all vessels sizes, with a greater proportion of red gurnard being caught by 20-40 m vessels.

59 GUR 7 quota is traded at about $4 700 per tonne (as at 30 September 2003), with ACE traded at about $993 per tonne. There are presently 44 quota owners in the fishery, and 99 ACE holders, with ACE holdings ranging up to 140 tonnes.

Customary Mäori

60 Red gurnard are considered to be of medium importance to customary interests. It is likely that customary fishers take this species as a bycatch of other target species.

61 No quantitative information is available on the current level of Mäori customary take.

Recreational fisheries

62 Red gurnard are taken by recreational fishers by virtue of its wide distribution in shallow coastal waters. It is often caught in Golden and Tasman Bays as a bycatch in the snapper and tarakihi target fisheries. The main methods of catching red gurnard are handlining, long lining and surfcasting.

63 The 1992-93 National Marine Recreational Fishing Survey estimates an annual recreational harvest for GUR 7 of 5-20 tonnes. The 1999-00 National Marine Recreational Fishing Survey provides an updated estimate of annual recreational harvest of 8.5-13.5 tonnes (23% CV).

Other sources of fishing-related mortality

64 It is possible that some red gurnard is discarded by commercial fishers who do not hold sufficient ACE to cover any bycatch to avoid deemed value penalties. It is also likely that some indirect fishing-mortality will occur through the escapement of fish from nets.

65 No quantitative information is available on the level of illegal catch or other sources of mortality.

ANNEX TWO

Statutory Considerations

66 In forming the management options the following statutory considerations have been taken into account:

TAC

67 The purpose of the Act (as provided in s 8) is to provide for utilisation of fisheries resources while ensuring sustainability. The proposed AMP for GUR 7 seeks to address a management problem by increasing the TACC to reflect increasing catch levels. The proposed TACC is supported by a research programme to provide additional stock assessment information to assess the performance of the stock under a higher TACC (including development of new stock abundance indices). It is unknown whether the proposed TACC is consistent with the purpose of the Act to provide for sustainable utilisation because of the uncertainty about stock status in relation to MSY.

68 The TAC set under s 13(2) of the Act should be set at a level that moves the stock towards a level that can produce the MSY. The 2003 Plenary agreed that it was unable to conclude that there is a reasonable probability that current biomass is greater than a size that will support MSY, or whether the higher TACC under the proposed AMP is likely to allow the stock to move towards MSY.

Environmental

69 The proposed TAC options are also based on:

a) No specific environmental conditions affecting the stock have been identified (as required to be considered under s 13(2)(b)(ii)). Red gurnard are found in inshore coastal areas and may be vulnerable to the effects of fishing. Growth, morphometrics, and recruitment may vary within and between areas, and are likely to be influenced by environmental factors such as water temperature and food availability;

b) Biological characteristics of the stock have been considered in setting the proposed TAC (as required to be considered under s 13(2)(b)(ii)). The 2003 Plenary also considered these characteristics in reaching its conclusions about the status of the GUR 7 stock; and

c) A range of important inshore species is associated with red gurnard due to the use of bottom trawl nets for commercial harvesting. The two most significant commercial species associated with GUR 7 catches are barracouta and flatfish, both of which are managed under the QMS. There is no information to suggest that the interdependence of stocks should affect the level of the TAC set for GUR 7 at this time.

70 There is no information regarding the natural variability of the GUR 7 fishery. However, the fishery may exhibit some variability as stock levels may be influenced by environmental factors.

71 Section 9(a) requires the maintenance of associated or dependent species above a level that ensures their long-term viability. Red gurnard live in close proximity to a variety of other inshore coastal species. Other than as juveniles (when they will be prey to predatory fish), red gurnard probably have no direct relationship with other fish species. Seabirds may occasionally interact with the associated target fisheries. The Challenger FMC would monitor the status of seabird interactions within the barracouta and flatfish fisheries under the proposed AMP. Fur seals and Hector's dolphins are resident in Golden and Tasman Bays, and along the west coast. Measures are currently in place to minimise the interaction between these species and the trawl fisheries. This includes ensuring marine mammals are not around nets when hauling and not returning offal to the sea during these times.

72 Section 9(b) requires the maintenance of biological diversity to be taken into account. Red gurnard are primarily caught as a bycatch in the bottom trawl fisheries. This method can potentially impact on species diversity by indiscriminately catching a wide range of inshore species, including protected marine mammals. It is not expected the proposed TAC would have any additional impact on biological diversity.

73 Section 9(c) requires consideration of protection of habitats of particular significance to fisheries management. No habitats of particular significance to fisheries management are associated with the GUR 7 fishery. MFish is not aware of any significant environmental issues associated with this fishery.

Allocation

74 The nature of the fishery and interests of customary and recreational interests have been considered in setting the proposed TAC. No mātaitai exists in the GUR 7 QMA, nor has an area been closed or fishing method restricted for customary fishing purposes in the QMA. No restrictions have been placed on fishing in any area within the QMA for recreational interests.

75 Section 13(3) requires consideration of relevant social, cultural and economic factors when determining the way and rate in which a stock is moved towards or above MSY. Retaining the current TACC may have a negative economic impact on some commercial fishers if catch levels continue to increase. However, the precise nature of these effects cannot be readily quantified. The inability to balance catches may create incentives for some fishers to return fish back to the sea to avoid paying deemed value penalties. Retaining the TACC may also have a secondary effect on the associated target fisheries, as some fishers who hold insufficient GUR 7 ACE to cover bycatch may move into less productive fishing areas to avoid catching red gurnard. However, catches have only effectively exceeded the TACC in the last fishing year, so it is not known whether fishers will continue to have problems in balancing catches.

Miscellaneous

76 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks, and the maintenance of biodiversity). There are no international obligations specific to red gurnard. MFish considers issues arising under the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for red gurnard.

77 Section 11(1)(b) provides that the Minister must take into account existing controls when setting or varying a sustainability measure such as a TAC. While no minimum legal size applies to commercial and recreational sectors, a minimum net mesh size of 100 mm applies in both sectors. Red gurnard are also one of the species that is subject to the amateur combined finfish daily bag limit of 20 fish in the Challenger Fishery Management Area.

78 Section 11(2A)(b) requires the Minister to take into account any relevant fisheries plan before setting or varying any sustainability measure. The Challenger FMC is understood to be developing a GUR 7 fisheries plan to support the proposed AMP. MFish has yet to receive this plan.

79 MFish is not aware of any considerations in any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to setting a TAC for the GUR 7 at this time.

80 The best available information on the status of GUR 7 is derived from the report from the Fishery Assessment Plenary, May 2003: stock assessments and yield estimates, the minutes of the 2003 Adaptive Management Programme Plenary, and information from the Challenger FMC regarding the proposed GUR 7 AMP. The absence of information is not a reason for failing to provide for utilisation at levels considered to be sustainable. In accordance with s 10 of the Fisheries Act, the absence of, or uncertainty in, any information should not be used as a reason for postponing or failing to take any measure to achieve the purpose of the Act.

ANNEX THREE

Stock Assessment Information

81 The AMP Plenary in December 2003 evaluated the stock assessment criteria and monitoring programme of the proposed GUR 7 AMP as part of the review required for proposed AMP fishstocks. The Plenary 2003 made the following statements regarding the AMP stock assessment criteria for the GUR 7 fishery.

Stock assessment criteria

82 The Plenary was unable to conclude that, on balance:

- There is a reasonable probability that the current biomass is greater than the size that will support B_{MSY};
- The proposed increase in TACC is likely to allow the stock to move towards B_{MSY}; and
- Stock abundance appears to be stable or increasing under current catch levels.

Monitoring criteria

83 The Plenary agreed the following monitoring measures would be necessary under an AMP:

- The use of commercial CPUE and FMA 7 trawl surveys to estimate abundance of GUR 7;
- The implementation of a voluntary logbook programme to provide more detailed information on the QMA 7 trawl fishery; and
- Collection of biological information (e.g. length, sex, otoliths) both by the industry and during FMA 7 trawl surveys.

Decision rule criteria

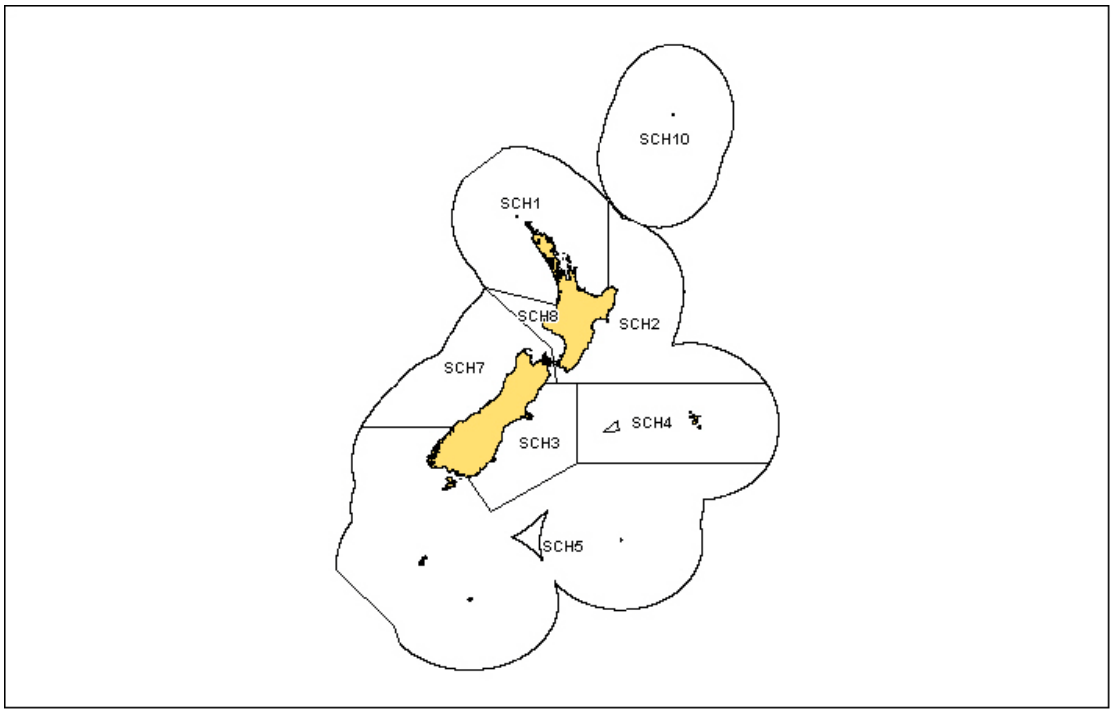
84 The Plenary regarded decision rules to be unnecessary on the grounds that a full analysis of all information every two to three years is a more effective way to review the performance of the stock. If successful this AMP would undergo a full review in March 2007, and again in 2010.

Environmental considerations

85 Given that over 90% of GUR 7 is taken as bycatch of the FMA 7 bottom trawl fishery, the proposed increase to the TACC is unlikely to have any additional impact on the environment.

SCHOOL SHARK (SCH 3) AMP REVIEW – INITIAL POSITION PAPER

Figure 1. Map showing the boundaries of SCH 3



Key Issues to be Considered

1 The key issues for school shark 3 (SCH 3) are:

a) Biological characteristics (late maturity, slow growth, and low fecundity) of school shark render it susceptible to overfishing;

b) SCH 3 is mainly a by-catch of the set net fishery for rig, trawl fishery for red cod, and line fishery for ling and häpuku/bass. There is a reasonable sized set net SCH 3 target fishery and a small target line fishery. The most important areas for taking SCH 3 vary by method. Set netting is important at Kaikoura, Pegasus Bay, Canterbury Bight and north Otago, trawling at Pegasus Bay and the Canterbury Bight, and the line fishery at Kaikoura and Pegasus Bay;

c) In most years between 1986 and 1998, the commercial catch was less than the TACC. In the last four fishing years, however, the average commercial catch of 355 tonnes has exceeded the TACC;

d) To date, the SCH 3 fishery has not been managed under, nor considered for, an adaptive management programme (AMP). Commencing in October 2004, South East Finfish Management Ltd (South East FML) seeks to increase the TACC by 20% from 322 tonnes to 387 tonnes under a five-year AMP;

e) The proposed TACC is about 7% greater than the average commercial catch of the last four fishing years but is 6% less than the 2002-03 fishing-year catch;

f) The December 2003 AMP plenary (Plenary) agree that school shark is one biological stock within New Zealand. No stock assessment of SCH 3 has been completed and no estimate of yield is available;

g) Plenary consider that, although the SCH 3 stock size may be uncertain, there is reasonable probability that the SCH 3 stock has increased to a level at, near, or above B_{MSY} and could be considered for an AMP; and

h) The SCH 3 AMP is being considered for a fishstock where there is a threatened population of Hector's dolphins. An increase in the TACC for SCH 3 may increase the risk of mortalities of marine mammals and sea birds.

Management Options

2 The proposed AMP management framework option for the TAC, TACC, and other allowances is presented in Table 1.

Table 1: Proposed management framework option for TAC/TACC increase for SCH 3

Programme	Proposed TAC (tonnes)	Customary Allowance (tonnes)	Recreational Allowance (tonnes)	Other sources of mortality (tonnes)	Proposed TACC (tonnes)	%TACC increase
Adaptive Management Program	502	48	48	19	387	20%

3 The proposal from South East FML is to establish a five year AMP for SCH 3, beginning 1 October 2004, that will increase the TACC from 322 tonnes to 387 tonnes. South East FML will:

a) analyse relative abundance indices using catch per unit of effort (CPUE) data from the main target and bycatch school shark fisheries operating in the SCH 3 area;

b) analyse trends in the bottom trawl fisheries in the SCH 3 area;

c) analyse SCH 3 biological information from the shark set net fishery;

d) maintain a voluntary code of practice to reduce the level of Hector's dolphin and seabird bycatch associated with SCH 3; and

e) analyse the recent trial of video observations of interaction of fishing with marine mammals and seabirds.

4 MFish also proposes that South East FML completes the video monitoring trials for detecting marine mammal and seabird interactions and, depending on results, implements an appropriate monitoring programme as soon as possible.

5 While reviewing the SCH 3 TACC, MFish proposes to set allowances for Mäori customary non-commercial interests, recreational interests, and other sources of fishing-related mortality. These allowances are in addition to the TACC increase proposed by South East FML.

Rationale for TAC and Allowances

Policy frameworks

6 When varying a total allowable commercial catch (TACC) for a quota management stock, the Fisheries Act 1996 (the Act) requires that a TAC be set under s 13 or s 14 and that, within the TAC, allowances are made for non-commercial fishing interests in that stock. MFish is proposing to set the TAC for SCH 3 under s 13 of the Act because the biological characteristics of school shark allow a MSY to be estimated, commercial catch limits of SCH 3 are not part of any international agreement, and the fishery is not managed on a rotational or enhanced basis.

7 When setting a TAC for SCH 3, a number of statutory obligations imposed by the Act must be taken into account before setting sustainability measures. The obligations are considered in detail in the "Statutory Obligations and Policy Guidelines" section (Annex 1).

8 The Plenary has agreed that SCH 3 could be considered for inclusion in the AMP because CPUE is stable in the SCH 3 set net fisheries. This may indicate increased abundance of school shark in this area and the TACC has been exceeded in recent fishing years whereas TACC was typically under caught in the early to late 1990s.

9 Only one option is proposed, a TAC increase under an AMP. MFish considers that an increase to the SCH 3 TAC is better addressed within an AMP than under the low knowledge bycatch (LKB) framework. SCH 3 does not meet the criteria for consideration of a TAC increase under the LKB framework as:

a) SCH 3 is not primarily a target fishery. Approximately 23% of the total SCH 3 commercial catch appears to be targeted. The main target fishing methods are, in order of take, set net, hook and line, and trawling;

b) Over the past 5 fishing years, the commercial catch of SCH 3 has averaged around 355 tonnes, which is only approximately 11% above the current TACC of 320 tonnes. In the last three fishing years, the commercial catch has exceeded the TACC by 13%, 6%, and 27%, respectively; and

c) A reasonable amount of stock assessment information is available for SCH 3 (biological and CPUE information).

10 Furthermore, an AMP framework has additional advantages:

a) School shark is vulnerable to overfishing due to its biological characteristics. Management of SCH 3 under an AMP reduces the risk of overfishing as the proposed AMP has appropriate monitoring and reporting arrangements to detect changes in abundance; and

b) The additional monitoring required under an AMP will provide information on set net and trawl interactions with marine mammals and seabirds.

TAC

11 South East FML has proposed a 20% increase in the TACC of SCH 3 from 322 tonnes to 387 tonnes to determine the sustainability of the fishery at around the level of recent catches. This increase in TACC for SCH 3 is the same percentage

increase as that proposed for the SCH 7 and SCH 8 AMPs, but more than that proposed for SCH 5 (South East FML is concerned that the SCH 5 fishery may have links with the seriously threatened Australian fishery).

12 No quantitative assessment of the status of the SCH 3 stock relative to the stock level that would produce the MSY is available. Plenary agree that school shark is one biological stock within New Zealand waters and that all four school shark stocks, SCH 3, 5, 7, and 8, could be considered for inclusion in the AMP. Plenary consider that, although the SCH 3 stock size is uncertain, there is reasonable probability that the SCH 3 stock has increased to a level at, near, or above $B_{MSY.}$ Plenary's conclusion was based on the large decrease in catch since SCH 3 was introduced to the QMS in 1986 and flat CPUE indices under recent catch levels above the TACC.

13 SCH 3 is mainly caught as a bycatch of trawl, set net, and line fisheries and the increased TACC is only 5% above the average annual catch of the last four fishing years, and less than last fishing years catch. In addition, the increased TACC is unlikely to lead to new areas being fished by the trawl industry. Therefore, MFish considers that, while the proposed increase to the SCH 3 TAC may increase the risk of adverse impacts on the threatened Hector's dolphin, this increased risk is likely to be low. South East FML has measures in place (voluntary code of practice) to mitigate and report on impacts on Hector's dolphins. South East FML is also developing an independent monitoring programme for marine mammals and seabirds based on video observations.

14 MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 3 fishery. South East FML is strongly encouraged to complete the video monitoring trials and, depending on results, to implement an appropriate monitoring programme as soon as possible. The SCH 3 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

15 In the absence of stock assessment information, proposed TACs for fisheries are usually based on known or estimated levels of recreational, Mäori customary, and commercial catch together with an estimate of all other sources of fishing-related mortality. In the absence of stock assessment information, this is the best information available on which to set a TAC that maintains the stock at or above the level that can produce the maximum sustainable yield. The allowances proposed, including that for other sources of fishing-related mortality, are in addition to the TACC increase proposed by South East FML. Accordingly, the proposed TAC for SCH 3 has been derived by summing the proposed TACC under the AMP, together with estimates of recreational, Mäori customary harvests, and other sources of fishing-related mortality.

Monitoring

16 South East FML's monitoring of the proposed TACC increase under the AMP is intended to provide information to enable the determination of the size, geographical extent and long-term yield of the SCH 3 stock. The TAC/TACC levels for SCH 3 can be reviewed if, on the balance of probabilities, it is determined that catch under the AMP is causing the stock to move below the level that will produce the maximum sustainable yield.

17 Given that independent information on relative abundance from trawl surveys is difficult to obtain for SCH 3, South-East FML proposes to monitor the fishery using relative abundance CPUE indices for SCH 3 derived from set net fishing events that target any shark species (spiny dogfish, elephant fish, and rig) or catch schoolshark. In addition, supplementary CPUE information and biological information (length and sex) will be obtained from logbooks placed on set net vessels targeting SCH 3.

18 Plenary agree that analysis of CPUE data from target set net fisheries recorded in MFish catch and effort logs can be used to monitor the SCH 3 stock and that the existing set net logbook programme for SCH 3 should be satisfactory to monitor the size frequency of the catch, provided an adequate level of coverage is maintained.

19 Plenary comment that the level of logbook coverage in the SCH 3 fishery has ranged from 10 to 25%. MFish considers that the minimum level of logbook coverage required is around 30% of fishing effort (trips/set/trawls). This level of participation should be readily achieved given the fact that South East FML represents over 90% of quota holders in SCH 3.

20 MFish considers that the monitoring (as agreed by the Plenary and with logbook coverage of 30% of fishing effort) of commercial CPUE, a logbook scheme, and ongoing collection of biological data should mitigate any risks to the sustainability of SCH 3 at the proposed TACC level. The proposed TACC increase, although 20% higher than the current TACC, is only 7% greater than the average yearly catch of the past four fishing years and is 6% less than the catch taken in the 2002-03 fishing year.

21 Given the importance of the AMP monitoring programme to mitigating risks to sustainability and possible impacts on marine mammals and seabirds, South-East FML will be required to provide annual updates of results to MFish. These updates must include information on the total catch, amount of coverage of fishing effort, logbook compliance, collection of biological data, monitoring of fishing-related mortality of marine mammals and seabirds, and development and implementation of an independent monitoring programme.

22 South East FML is also responsible for providing information, including CPUE and biological information, for a full review of the SCH 3 AMP in March 2007, and in 2010, at the conclusion of the 5-year AMP.

TACC

23 The AMP proposal by South East FML is to increase the TACC of SCH 3 by 20% from 322 tonnes to 387 tonnes.

24 The increase in the TACC for SCH 3 should have short-term economic benefits. The 65 tonnes proposed increase to the TACC has a gross value of $154 830, based the December 2000 port price of $2 382 per tonne, without taking account of export value. However, recent catch levels are only slightly less than the proposed TACC and most of the economic benefit to the industry will result from the reduced deemed value penalties.

25 There should also be economic benefits that extend from cost-effective gathering of information from the fishery under the AMP. The information could result in

improved assessment of the SCH 3 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery. The proposed TACC increase has some economic costs because of the required monitoring.

26 Longer-term benefits to the SCH 3 fishery will be dependent on future stock status. Earnings from the fishery are likely to increase with greater catches and there is a likelihood of additional positive downstream implications.

27 MFish considers the higher TACC is unlikely to result in increased adverse effects on other stocks within multistock fisheries as the proposed TACC increase for SCH 3 is around commercial catch levels of recent years.

Recreational and customary

28 The 1991-92 (1992) estimate of recreational harvest of SCH 3 is between 15 and 35 tonnes. The 1999-2000 (2000) survey of recreational catch of SCH 3 provides an estimate of between 26 and 70 tonnes and a point estimate of 48 tonnes. MFish considers that the best available estimate of the recreational catch of SCH 3 is around 50 tonnes. As discussed in Annex 2, it is likely that the 2000 estimate of 48 tonnes better represents the total annual landed recreational catch of school shark in SCH 3, at approximately 13% of the commercial catch.

29 MFish proposes that the Minister set an allowance for recreational fishers as outlined in the Statutory Obligations and Policy Guidelines section. The allowances proposed for recreational use of the school shark fishery reflect the likely level of fishing activity.

30 School shark (makohuarau) is a traditional Ngäi Tahu resource. It is widely distributed in the inshore zone, readily caught by traditional fishing methods, and highly prized as a food source. School shark is known to be of considerable importance to customary fishers on the east coast South Island. MFish proposes that the Minister set an allowance for customary fishers, as outlined in the Statutory Obligations and Policy Guidelines section, at a catch level similar to the estimated recreational catch.

31 The Ministry considers that the proposed increase to the SCH 3 TACC is unlikely to affect the size and availability of school shark for non-commercial fishers as commercial fishers generally catch school shark further offshore outside the areas fished by non-commercial fishers. In addition, a number of inshore areas where SCH 3 is easily available are closed to commercial fishing. Mätaitai reserves at Rapaki and Koukourarata, on Banks Peninsula, exclude commercial fishing. There are prohibitions on trawling and set netting near river mouths and harbour areas within the SCH 3 area. The commercial fishing industry also voluntarily refrains from trawling and set netting close inshore in the Canterbury Bight.

32 MFish proposes that allowances for recreational and customary harvest be set at 48 tonnes each.

Other sources of fishing-related mortality

33 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality. Most of the SCH 3 catch is taken by target set net and hook & line fisheries, and as a bycatch of trawl fisheries. MFish considers that an allowance should be made for incidental mortality of injured fish escaping from trawl and set nets and from the capture and release of undersize fish, as discussed in Annex 2. MFish proposes that the allowance for other sources of mortality caused by fishing be set at 5% of the TACC proposed under the AMP programme, that is, 19 tonnes. The allowance proposed for other sources of fishing-related mortality are in addition to the TACC increase proposed by South East FML.

Future Management

34 The AMP for SCH 5 is to run for 5 years. The AMP will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two fishing years and again at the end of the five fishing years of the programme to determine if the higher TACC is sustainable.

35 MFish will be undertaking further surveys to determine the levels of recreational catch (including SCH 3) over the next five years, and reporting of customary Mäori catch will continue under the reporting requirements of the Fisheries (South Island Customary Fishing) Regulations 1999. A research project[6] is underway to review the indices of relative abundance for school shark from existing commercial bycatch and target data; previous studies had concentrated on target fisheries only.

36 Depending on the outcome of the programme and revised estimates of non-commercial catches, MFish may propose the review of sustainability and utilisation measures for SCH 3 in 2007 and 2010.

37 A key consideration at the completion of the five-year period will be whether or not the TACC should revert back to the current level. The AMP is primarily intended as an information gathering mechanism to assess whether or not a stock is capable of providing a greater yield. The alternative to the AMP is that conventional stock assessment techniques are employed to assess the fisheries yield – these techniques do not necessarily involve an increase in the TAC and TACC.

Conclusion

38 The South East FML has proposed, under a new AMP, a 20% increase to the TACC for SCH 3 from 322 tonnes to 387 tonnes.

39 Plenary consider that, although the SCH 3 stock size may be uncertain, there is reasonable probability that the SCH 3 stock has increased to a level at, near, or above B_{msy}. Plenary's conclusion is based on the large decrease in catch since SCH 3 was introduced to the QMS in 1986 and flat CPUE indices under recent catch levels above the TACC. Plenary has agreed that SCH 3 could be considered for inclusion in the AMP because CPUE is stable in the target set net fishery and this may indicate increased abundance of school shark.

[6] Research Project HPB2002/01 Catch per unit effort analyses for school shark from bycatch and target fisheries in New Zealand, 1989-90 to 2001-02

40 The main objective of the proposal is to ascertain whether the SCH 3 stock is capable of sustaining higher catches consistent with the assumption that the stock is above the B_{MSY}.

41 MFish considers it has taken into account the statutory obligations required by the 1996 Act in evaluating this management proposal, as detailed in Annex 1.

42 The proposed increase to the SCH 3 TACC is unlikely to affect the size and availability of school shark for non-commercial fishers as commercial fishers generally catch school shark further offshore outside the areas fished by non-commercial fishers and there are significant voluntary and regulatory measures that exclude commercial fishing inshore.

43 While the proposed increase to the SCH 3 TAC may increase the risk of adverse impacts on the threatened Hector's dolphin, this increased risk is likely to be low. However, MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 3 fishery. South East FML is strongly encouraged to complete the video monitoring trials and to implement an appropriate monitoring programme as soon as possible. The SCH 3 AMP will be reviewed in 2007z and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

Preliminary Recommendations

44 MFish proposes, under the Adaptive Management Programme, to include a new five-year programme for school shark in SCH 3 that will:

a) set the TAC at 502 tonnes;

b) make allowances of 48 tonnes for Mäori customary use and 48 tonnes for recreational harvest;

c) make an allowance of 19 tonnes for other sources of fishing-related mortality;

d) increase the TACC by 20% from 322 tonnes to 387 tonnes;

e) require South East FML to implement a logbook programme and biological sampling in the SCH 3 fishery with the aim of covering at least 30% of fishing effort (trips/sets/trawls);

f) require South East FML to provide annual updates to MFish on the compliance with keeping of logbooks, collection of biological information, and monitoring of fishing-related mortality of marine mammals and seabirds;

g) require South East FML to provide full reports to the AMP Working Group and Plenary in 2007 and 2010 on standardised CPUE analysis for the SCH 3 fishery, biological information, and monitoring of fishing-related mortality of marine mammals and seabirds; and

h) require South East FML to continue to implement measures to mitigate potential impacts of fishing on Hector's dolphins and seabirds. In particular, require South East FML to implement an appropriate monitoring programme as soon as possible.

ANNEX ONE

Statutory Considerations

TAC

45 The purpose of the Act (s 8) is to provide for utilisation of fisheries resources while ensuring sustainability. Utilisation is defined in the Act as including development of fisheries resources. The AMP for SCH 3 is intended to provide a structured and monitored way to explore the developmental opportunities of the fishery, while ensuring sustainability. The increased TAC, allowances and TACC will provide for development of the fishery and create the potential for people to better provide for their social, cultural, and economic well-being.

46 The TAC, under s 13, should be set to maintain the stock at, or move the stock towards or above the level that can produce the MSY, having regard to the interdependence of stocks. Plenary consider that, although the SCH 3 stock size may be uncertain, there is reasonable probability that the SCH 3 stock has increased to a level at, near, or above B_{MSY}.

47 A range of species is likely to be caught in the trawl, set net and line fisheries that take school shark as a bycatch in SCH 3. The most significant commercial species taken in the SCH 3 fishery are barracouta, flatfish häpuku/bass, ling, red cod and rig, 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 SCH 7 at this time (s 13(2)(c)).

48 There should be economic benefits from the cost-effective gathering of information under the AMP. This information could result in improved assessment of the SCH 3 stock relative to the level that would produce the MSY. Improved assessment of the SCH 3 stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

49 While increasing the SCH 3 TACC, as proposed, will have economic benefits in the short term, longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

50 SCH 3 is taken as a bycatch of other target trawl and bottom longline fisheries. A higher TACC for SCH 3 may make it easier for fishers to obtain ACE to cover their bycatch of school shark as the increased TACC will generate more ACE.

51 MFish notes that this developmental opportunity creates potential for some economic benefits without creating any anticipated social, economic or cultural issues for other sectors (13 (3)).

52 SCH 3 does not appear to be subject to any significant fluctuation in biomass from year to year as catches have steadily risen in recent years. MFish is of the view that it is not necessary to take into account natural variability of when setting or varying the TAC/TACC or other allowances (11 (1)(c)).

Environmental

53 The Act includes statutory obligations to avoid, remedy, or mitigate any adverse effects of fishing on the aquatic environment when setting or reviewing a TAC.

54 Under the provisions of the Marine Mammals Act 1978, Hector's dolphin has been declared a threatened species. There is a set net fishing-related mortality limit of 3 for the Pegasus Bay-Canterbury Bight part of the SCH 3 area and the South East FML operates a voluntary code of practice in the set net industry to mitigate the effects of fishing on Hector's dolphins. South-East FML's voluntary set net code of practice includes a number of measures to reduce the possibility of dolphin bycatch, including the use of acoustic pingers on set nets to deter dolphins and no-fishing areas.

55 South-East FML is also trialing video monitoring of small vessels in QMA 3 as a potential monitoring tool for detecting the interaction of marine mammals and seabirds with fishing. Plenary note that, under the proposed TACC, it is unlikely that the trawl fishery will expand into new areas.

56 Given the Plenary conclusions and that the increased TACC is around the level of recent commercial catches (approximately 7.5% above the average annual catch of the last four fishing years yet less than the most recent last fishing year catch), MFish considers that the risk of the proposed increase to the SCH 3 TAC and TACC significantly increasing the adverse impacts on Hector's dolphins is low.

57 The Act, in s 9(a), requires that associated or dependent species (non-harvested species) should be maintained above a level that ensures their long-term viability is taken into account.

58 The SCH 3 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 AMP proposal notes that offal is typically discarded in the set net fishery after nets have been retrieved, as there are insufficient people on these vessels to retrieve the net and process the fish simultaneously. Thus, the potential for interactions with seabirds is reduced. The draft Seabird Interaction with Fisheries in the New Zealand Exclusive Zone - A Review and National Plan of Action 2000 document does not list school shark as one of the fisheries with seabird interactions that are of concern.

59 These factors, taken together, suggest that the proposed increase to the SCH 3 TAC/TACC is unlikely to increase the risk of mortalities of marine mammals and seabirds, particularly when the increase to the TACC is around current catch levels. Reporting of bycatch and protected species will allow for information to be collected to increase our knowledge of any impacts.

60 However, MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 3 fishery. South East FML is strongly encouraged to complete the video monitoring trials and, depending on results, to implement an appropriate monitoring programme as soon as possible. The SCH 3 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

61 The Act, in s 9(b) and (c) respectively, requires that biological diversity of the aquatic environment should be maintained, and that habitats of particular significance to

fisheries management should be protected. There are no other known impacts on biodiversity that would be specific to the SCH 3 fishery.

62 MFish notes that there is little information on habitats of particular significance to the management of SCH 3. However, MFish notes that industry has voluntarily closed an area off Otago Peninsula to trawling as a measure to avoid the adverse effects of fishing on the unique bryozoan biodiversity located there. A number of habitats of particular significance to fisheries management are closed seasonally or all year by regulation, or by voluntary agreement, including most of the inshore areas of Pegasus Bay, Banks Peninsula, and the Canterbury Bight to protect inshore breeding and nursery areas of small sharks.

Other statutory considerations

63 MFish considers that there are no issues arising under international obligations or the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 that are not adequately addressed in the management options proposed for SCH 3 (s 5(a)&(b)).

64 Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls under the Act which are required to be taken into account by s 11(1)(b) for SCH 3 include the following:

- A minimum net mesh size of 100 mm[7] for recreational and commercial fishers.
- A daily bag limit of 5[8] school shark for recreational fishers within a combined daily bag limit of 30 finfish.
- Trawling is prohibited in Pegasus Bay, from Waimakariri River to Godley Head, Le Bons Bay and Akaroa Harbour[9].
- Trawling, and set nets greater than 1000 m, are prohibited in the main harbours in SCH 3. Set netting and trawling is prohibited over summer months near major river mouths[10].

65 While a fisheries plan may provide another mechanism through which to explore the potential of the SCH 3 fishery, no fisheries plan has been developed or approved to date (s 11 (2A)(b)).

66 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 this proposal for SCH 3. No decision has been made not to require a service in this fishery (s 11 (2A)(a&b)).

67 Before setting or varying any sustainability measure for SCH 3, the Minister must take into account any provisions of any regional policy statement, regional plan, or

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[7] Regulation 31(6) of the Fisheries (Commercial fishing) Regulations2001
[8] Regulation 3A(1) of the Fisheries (South-East Area Amateur Fishing) Amendment Regulations 1999
[9] Regulation 4 of the Fisheries (South-East Area Commercial Fishing) Regulations 1986
[10] Regulation 3D & 5 of the Fisheries (South-East Area Commercial Fishing) Regulations 1986

proposed regional plan under the Resource Management Act 1991 and any management strategy or plan under the Conservation Act 1987.

68 Within SCH 3, there are four Department of Conservation conservancies, Nelson/Marlborough, Canterbury, Otago and Southland. These conservancies have produced conservation management strategies under the Conservation Act 1987 which identify a number of issues. The ones of significance to the SCH 3 fishery advocate the sustainable use of marine fisheries and promoting the protection of significant marine ecosystems from the adverse effects of fishing practices.

69 The proposed TAC/TACC increase under this AMP, and the subsequent monitoring, is designed to ensure that sustainable use of this resource is achieved while carefully monitoring for any additional impacts on marine ecosystems or marine mammals. In the absence of a completed population management plan for Hector's dolphins, the use of acoustic pingers and the voluntary code of practice have been adopted by industry to reduce the possibility of dolphin mortalities associated with the commercial fishery (s 11(2)(a)). MFish and South East FML are also developing an appropriate programme to monitor the effects of fishing on marine mammals and seabirds in the SCH 3 fishery.

70 There are three Regional Councils within SCH 3, Environment Canterbury, Otago Regional Council, and Environment Southland. The Otago Regional Council has a fully operational regional coastal plan under the Resource Management Act 1991. Environment Canterbury and Environment Southland have partially operational regional plans (parts of these plans are subject to appeals to the Environment Court). These plans have been examined but there are no provisions applicable to the proposed TACC increase under this SCH 3 AMP.

71 The interests of the recreational, Mäori customary non-commercial fishing sectors, and all other fishing-related mortality to the SCH 3 stock caused by fishing have been considered in setting the TACC. Two mätaitai reserves exist in SCH 3, at Rapaki and Koukourarata (Port Levy) on Banks Peninsula. A small area has been temporarily closed at Kaikoura under the customary fishing provisions of the Act. No restrictions have been placed on fishing in any area within SCH 3 for recreational interests(s 21(1)(a) & (b), 4(i) & (ii), 21(5)).

72 The information principles of the Act require that decisions be based on the best available information, take into account any uncertainty of this information, and apply 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.

73 MFish considers that the information used to evaluate the SCH 3 proposal is the best available. The stock information has been reviewed by the AMP Working Group and by Plenary. While it is recognised that the current status of the stock is uncertain, the monitoring criteria for the proposal will allow for improved information to be obtained. There is little information on marine mammal and seabird interactions with the SCH 3 fishery, and that information is uncertain. MFish does not believe that the uncertainty about the stock status is a reason to prevent the Minister from approving this AMP.

ANNEX TWO

Biological Characteristics

74 School sharks are distributed across the shelf, generally being inshore in summer and offshore in winter. They extend in decreasing numbers further offshore to at least 600 m depth. Capture of school sharks by tuna longliners shows their distribution extends well offshore, up to 180 nm off the South Island, and 400 nm off northern New Zealand towards the Kermadec Islands.

75 Breeding is not annual; it has generally been assumed to be biennial, but recent work on a Brazilian stock suggests that females have a three year cycle. Fecundity (pup numbers) increases from five to 10 in small females to over 40 in the largest. Mating is believed to occur in deep water, probably in winter. Release of pups occurs during spring and early summer (November-January), apparently earlier in the north of the country than in the south. Nursery grounds include harbours, shallow bays, and sheltered coasts. The pups remain in the shallow nursery grounds during their first one or two years and subsequently disperse across the shelf. The geographic location of the most important pupping and nursery grounds in New Zealand is not known.

76 Growth rates have not been estimated for New Zealand fish but in Australia and South America school sharks are slow growing and long-lived. They are difficult to age by conventional methods, but up to 45 vertebral rings can be counted. Growth is fastest for the first few years, slows appreciably between five and 15 years, and is negligible after 20 years.

77 Sexual maturity is estimated to occur at 12-17 years for males and 13-15 years for females. The size range of commercially-caught maturing and adult school shark is 90-170 total length (TL), with a broad mode at 110-130 cm TL, which varies with area, season, and depth.

78 The combination of late maturity, slow growth, and low fecundity gives low overall productivity. In Australia, natural mortality has been estimated at 0.10. Results from an Australian long-term tag recovery suggest a maximum age of at least 50 years.

79 New Zealand tagging studies have shown that school shark may move considerable distances, including trans-Tasman Ocean migrations. But the majority of recaptures are in the same QMA. These tagging studies suggest that there is a single biological stock.

Catch Information

Commercial fisheries

80 The total commercial catch of school shark throughout the 1970s averaged about 550 tonnes due to modest demand for fillets by the Australian market. Development of the New Zealand and Australian markets, and the use of more efficient set nets, resulted in the catch rising rapidly to a national peak of nearly 4 000 tonnes in 1983.

81 Commercial catches in SCH 3 rose rapidly to a peak at 630 tonnes in 1983-84. Commercial catch declined rapidly over the next two fishing years. A total allowable catch for SCH 3 of around half the commercial catch of the 1983-84 fishing year (270 tonnes) was set when school shark was introduced to the quota management system in 1986 because of the declining catch rates and concerns about the low productivity of this stock.

82 Since 1986, SCH 3 catch and total allowable commercial catch have steadily increased, the latter by 20% as a result of quota appeals. Commercial catch of SCH 3 has averaged around 350 tonnes over the last five fishing years and has exceeded the TACC each fishing year during this period.

83 Bycatch of set net, trawl and line fisheries accounts for about 80% of the SCH 3 commercial catch. The main fishing method for SCH 3 is set netting, which accounts for around 58% of SCH 3 commercial catch. Sixty two per cent of the set net catch is bycatch of the rig target fishery with the remainder targeted. Bycatch of the bottom trawl fisheries accounts for almost 37% of the commercial catch with red cod the main target fishery. Long lining accounts for 5% of the commercial catch but only 16% is targeted with the rest taken as bycatch of the ling and häpuku/bass target fisheries.

84 The most important areas for taking SCH 3 vary by method; set netting is important in Areas 018 (Kaikoura), 020 (Pegasus Bay), 022 (Canterbury Bight), and 024 (north Otago), trawling is important in Areas 022 (Canterbury Bight) and 020 (Pegasus Bay), and hook & line is important in Areas 018 (Kaikoura), and 020 (Pegasus Bay).

Table 2: Reported landings (tonnes) and TACCs (tonnes) of school shark from SCH 3 from 1986–87 to 2001-02.

Year	Landings(tonnes)	TACC(tonnes)
1986–87	283	270
1987–88	320	285
1988–89	220	294
1989–90	272	305
1990–91	227	318
1991–92	260	318
1992–93	220	322
1993–94	202	322
1994–95	237	322
1995–96	293	322
1996–97	289	322
1997–98	271	322
1998–99	335	322
1999–00	343	322
2000–01	364	322
2001–02	324	322
2002–03	410	322

85 Further commercial catch information can be found in the SCH 3 *Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 4 September 2003, produced by the South East Finfish Management Limited. This document can be viewed on the Ministry of Fisheries website at http://www.fish.govt.nz/sustainability/research/assessment/index.html. You will be asked for a username and a password. The username is: working group;

the password is: bluenose. Under '2003 Working Group Documents' the required document is listed as 'SCH 3 AMP Proposal'.

Recreational fisheries

86 Recreational fishing surveys have been undertaken in 1991-92, 1996, 1999-00, and 2000-01 to provide recreational harvest estimates. The 1991-92 (1992) estimate of recreational harvest of SCH 3 is between 15 and 35 tonnes.

87 The Ministry Recreational Fisheries Working Group, which met in October 2003, was satisfied with the general methodology of the 1999-00 survey, and that the results from the 1999-00 survey, and the 2000-01 follow-up survey, were acceptable. It was noted that caution needs to be exercised with the interpretation of some figures, particularly for QMA 2 fishstocks, and where the coefficient-of-variation is high. The Working Group meeting concluded that the1999-00 survey and the 2000-01 follow-up survey generally should be used in preference to the earlier surveys.

Table 3: Estimated harvest of SCH 3 by recreational fishers from recreational fishing diary surveys

Survey	Fishstock	Point estimate (tonnes)	Range (tonnes)
1991-92	SCH 3	NA	15 - 35
1996	SCH 3	NA	-
1999-00	SCH 3	48	26 - 70
2000-01	SCH 3	NA	NA

88 From inspection of the 1999-00 and 2000-01 harvest estimates, it appears that most QMA 3 finfish harvest estimates were lower in 2000-01 compared with 1999-00. It appears that some factor(s), such as adverse weather, has affected QMA 3 catches in 2000-01. It is likely that the 1999-00 estimate of SCH 3 better represents the total annual landed recreational catch.

89 The 1999-2000 (2000) survey of recreational catch of SCH 3 provides an estimate of between 26 and 70 tonnes and a point estimate of 48 tonnes. Information on SCH 3 recreational catch from the 2000-01 survey is not available. It is likely that the 1999-00 estimate of 48 tonnes represents the total annual landed recreational catch of school shark in SCH 3, at approximately 13 % of the commercial catch.

Customary fisheries

90 Tangata tiaki have been appointed under the Fisheries (South Island Customary Fishing) Regulations 1999 for much of the SCH 3 area. No catch of SCH 3 has been reported by tangata tiaki. School shark, however, is known to be of considerable importance to customary fishers on the east coast South Island.

Other sources of fishing-related mortality

91 No quantitative information is available on the level of illegal catch or other sources of fishing- related mortality. SCH 3 is mainly caught by trawl and set nets.

92 There is likely to be an element of mortality associated with the trawl and set net fisheries as some school shark that escape through the net will be fatally injured.

Existing controls

93 A minimum net mesh size of 100 mm for both commercial and recreational fishers.

94 The amateur daily bag limit in SCH 3 is five school shark within a combined daily bag limit of 30 finfish.

95 There are a number of controls on fishing gear used by amateurs to catch SCH 3, including only being able to use one small set net (less than 60m) and longlines must have less than 25 hooks.

96 Commercial fishers must service their nets within 18 hours and may only use nets less than 1000m in length and, generally, are not able to set more than 3000m of net each day.

97 Trawling is prohibited in Pegasus Bay, from Waimakariri River to Godley Head[11]. Trawling, purse seining, teichi netting, and set nets greater than 1000 m are prohibited in harbours; Akaroa Harbour, Timaru Harbour, Oamaru Harbour, Otago Harbour, Le Bons Bay[12]. Set netting and trawling is prohibited from January to April each year near major river mouths; Waiau, Hurunui, Waimakariri, Rakaia, Ashburton, Rangitata, Orari, Opihi, Waitaki[13]. Trawling by vessels over 46 metres length is prohibited within New Zealand Territorial Waters[14].

98 Commercial fishing is prohibited in mätaitai reserves at Rapaki and Koukourarata (Port Levy) on Banks Peninsula.

99 Recreational set netting is prohibited from October to March each year in coastal waters to four nautical miles seaward of the coast from the Waiau River to the Waitaki River.

100 The commercial fishing industry also voluntarily refrains from fishing close inshore in the Canterbury Bight (out to four nautical miles in summer months).

101 The Banks Peninsula Marine Mammal Sanctuary, under the Marine Mammals Protection Act 1978, prohibits all set netting from October to March from Sumner Head to the Rakaia River extending seaward to four nautical miles.

Social, cultural and economic factors

102 School shark (makohuarau) is a traditional Ngai Tahu resource. It is widely distributed in the inshore zone, readily caught by traditional fishing methods, and highly prized as a food source.

103 School shark in SCH 3 is an important recreational fishery and is mainly caught by shore fishers in the Canterbury Bight and boat fishers in Otago waters. Boat fishers also catch SCH 3 using set nets and hand lines.

104 SCH 3 quota is currently (December 2003) being traded at $12 178 per tonne, with ACE traded at $694 per tonne. There are 58 quota owners in the fishery, and 96 ACE

[11] Regulation 4 (a), Fisheries (South-East Commercial Fishing) Regulations 1986.
[12] Regulation 3D of the above regulations.
[13] Regulation 5 of the above regulations.
[14] Regulation 47A, Fisheries (Commercial Fishing) Regulations 1986

holders with ACE holdings ranging from 47 holders with less than 0.5 tonnes each to 12 holders with between 10 and 50 tonnes. The port price was $2 227 per tonne (December 2003), so that the 65 tonne increase in the TACC is valued at $ 144 755 domestically, without taking any account of export value.

Stock Assessment

105 The AMP Plenary in December 2003 agreed the following regarding the fit to the AMP stock assessment criteria for all school shark stocks.

Stock assessment criteria

106 The stock size may be uncertain, but based on a large decrease in catches upon introduction of this species to the QMS in 1986, and stable or possibly increasing CPUE indices under recent catch levels above the TACC, there is reasonable probability that these Fishstocks have increased to levels at, near or above B_{MSY}.

107

Monitoring criteria

108 The existing monitoring programme in SCH 3 and 5 from set net logbooks may be satisfactory to monitor the size frequency of the catch, provided adequate level of coverage is maintained. In SCH 7 and 8, the existing logbook programme needs to be expanded to cover school shark.

Decision rule criteria

109 A decision rule to review all information in 2007 after two years operation of the AMP was agreed.

Environmental considerations

110 Hector's dolphin populations are found throughout all the SCH fisheries proposed for the AMP increase. The use of pingers in some areas and adherence to voluntary codes of practice are designed to reduce the possibility of mortalities associated with the commercial set net fishery. Video monitoring of the small vessel fishing fleet in QMAs 3 and 5 is being trialed as a potential monitoring methodology. There are not considered to be any likely increased impacts of fishing from the trawl fishery in these stocks.

Future review

111 The AMPs will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two years and at the end of the five years of the programme.

Conclusions

112 The AMP Plenary agreed that all 4 SCH stocks could be considered for inclusion in the adaptive management programme. The stable or increasing CPUE in the target set net fisheries in SCH 3, 5, 7 and 8 may indicate increased abundance of school shark in

these areas. The combined TACC for these stocks has been exceeded in three of the last four years whereas the TACCs were always under caught in the early 1990s.

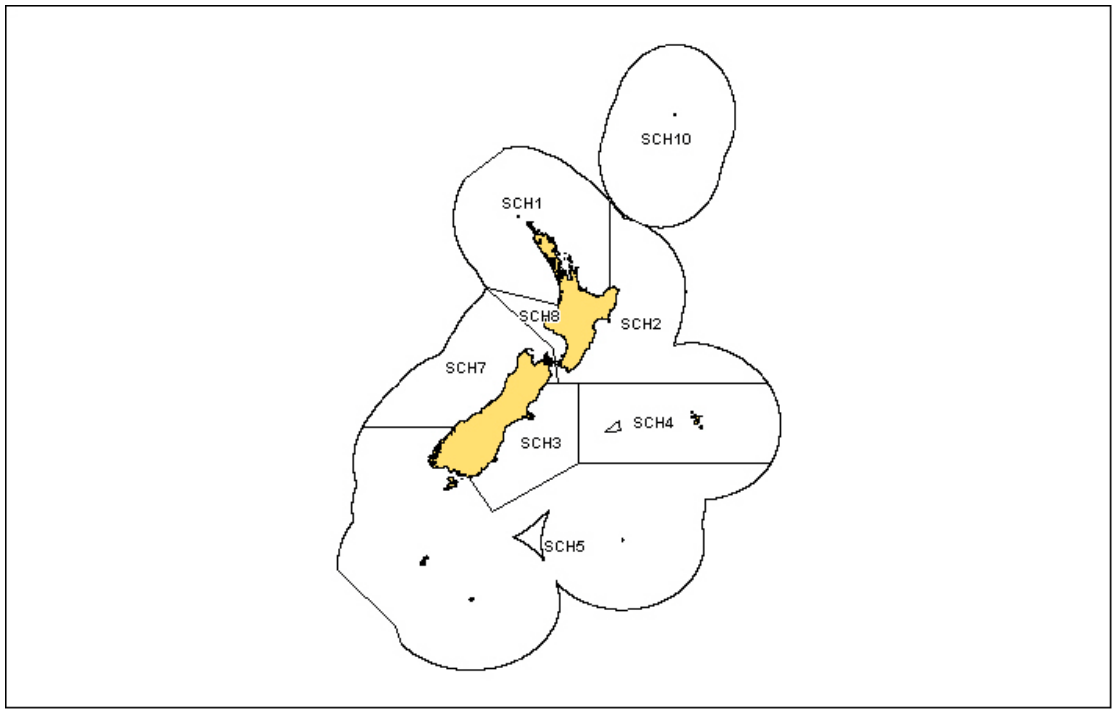
Research plan

113 There are a number of recent research projects that specifically relate to the SCH 3 fishery. These are:

- Carry out a stock assessment of school shark. 1. Estimate biomass and sustainable yields. *(SCH1999/01)*;
- Determine areas of habitat of importance to fisheries management within the NZ EEZ. 1a. Determine areas of important juvenile fish habitat. 1c. Determine areas of importance for shark populations for pupping or egg laying. *(ENV1999/03)*;
- Investigation of areas of habitat of particular significance for fisheries management within the New Zealand EEZ. 1. To map bryozoan-dominated epibenthic assemblages in Golden and Tasman Bay and the outer Marlborough Sounds. 2. To review the role and influence of frame-building bryozoans and associated seabed structure on epibenthic biodiversity and the life history of commercially valuable species and make research recommendations on how to formally assess this role *(ENV2001/13)*; and
- Estimating relative abundance from bycatch and target school shark fisheries. *(*HPB2002*/01).*

SCHOOL SHARK (SCH 5) AMP REVIEW – INITIAL POSITION PAPER

Figure 1. **Map showing the boundaries of SCH 5.**



Key Issues to be Considered

1 The key issues to be considered for SCH 5 are:

a) Biological characteristics (late maturity, slow growth and low fecundity) of school shark make it likely to be susceptible to overfishing;

b) The SCH 5 fishery is mainly a target set net fishery with small bycatch fisheries associated with the set net fishery for rig, trawl fishery for stargazer, and the longline fishery for ling and häpuku/bass. Most of the SCH 5 is caught off south-east Stewart Island and in western Foveaux Strait;

c) SCH 5 was introduced into the quota management system (QMS) in 1986 with a commercial catch limit of 610 tonnes (based on yield estimates derived from trawl surveys) to address declining catch rates and low productivity concerns;

d) Since 1986, commercial catch and commercial catch limits of SCH 5 have steadily increased, the latter by 14% as a result of quota appeals. Commercial catch of SCH 5 has averaged around 715 tonnes or 3% above the total allowable commercial catch (TACC) of 694 tonnes over the last five fishing years;

e) The SCH 5 fishery has not been managed under an adaptive management programme (AMP) in the past, nor has an AMP been considered for the fishery. South East Finfish Management Ltd (South East FML) seeks to

increase the total allowable commercial catch (TACC) for SCH 5 by 5% from 708 tonnes to 743 tonnes for a five-year period under an AMP;

f) The proposed AMP TACC increase for SCH 5 is about 3% above the average commercial catch of the last four fishing years and 3% less than the 2002-03 fishing year catch;

g) The December 2003 AMP Plenary (Plenary) agree that school shark is one biological stock within New Zealand. No stock assessment of SCH 5 has been completed and no estimate of the yield of SCH 5 is available; and

h) Plenary consider that although the SCH 5 stock size may be uncertain there is reasonable probability that the SCH 5 stock has increased to a level at, near or above B_{msy} and could be considered for inclusion in the AMP.

i) The SCH 5 AMP is being considered for a fishstock where there is a threatened population of Hector's dolphins.

Management Options

2 The proposed management option for the TAC, TACC and allowances for SCH 5 is under the AMP framework and is presented in Table 1.

Table 1: Proposed management option for TAC/TACC increase for SCH 5.

Programme	Proposed TAC (tonnes)	Customary Allowance (tonnes)	Recreational Allowance (tonnes)	Other sources of mortality (tonnes)	Proposed TACC (tonnes)	%TACC increase
Adaptive Management Program	794	7	7	37	743	5

3 The proposal from South East FML is to establish a five year AMP for SCH 5, beginning 1 October 2004 that will increase the TACC from 708 tonnes to 743 tonnes. South East FML will:

a) analyse relative abundance indices using catch per unit of effort (CPUE) data from the main target and bycatch school shark fisheries operating in the SCH 5 area;

b) analyse SCH 5 biological information from the target shark set net fishery;

c) maintain a voluntary code of practice to reduce the level of Hector's dolphin and seabird bycatch associated with SCH 5; and

d) analyse the recent trial of video observations of interaction of fishing with marine mammals and seabirds.

4 MFish also proposes that South East FML completes the video monitoring trials for detecting marine mammal and seabird interactions and implements an appropriate monitoring programme as soon as possible.

5 While reviewing the SCH 5 TACC, MFish proposes to set allowances for Mäori customary non-commercial interests, recreational interests, and other sources of fishing-related mortality. These allowances are in addition to the TACC increase proposed by South East FML.

Rationale for TAC and Allowances

Policy frameworks

6 When varying a total allowable commercial catch (TACC) for a quota management stock, the Fisheries Act 1996 (the Act) requires that a TAC be set under s 13 or s 14 and that, within the TAC, allowances are made for non-commercial fishing interests in that stock. MFish is proposing to set the TAC for SCH 5 under s 13 of the Act because the biological characteristics of school shark allow an MSY to be estimated, commercial catch limits of SCH 5 are not part of any international agreement, and the fishery is not managed on a rotational or enhanced basis.

7 When setting a TAC for SCH 5, a number of statutory obligations imposed by the Act have to be taken into account. These obligations are considered in detail in the Statutory Obligations and Policy Guidelines section (Annex 1).

8 The Plenary has agreed that SCH 5 could be considered for inclusion in the AMP because CPUE is stable in the target set net fisheries in SCH 5. This may indicate increased abundance of school shark in this area and the TACC has been exceeded in recent fishing years whereas the TACC was always under caught in the early 1990s.

9 Only one option is proposed, a TAC increase under an AMP. MFish considers that an increase to the SCH 5 TAC is better addressed within an AMP than under the low knowledge bycatch (LKB) framework. SCH 5 does not meet the criteria for consideration of a TAC increase under the LKB framework as:

a) A significant component (90%) of the total SCH 5 commercial catch is targeted. The main target fishing method for SCH 5 is setnetting which catches 88% of the total SCH 5 catch. Bycatch of the bottom trawl fisheries accounts for 7% of the total catch with stargazer the main target fishery. Longlining accounts for 4% of the total catch which is mainly bycatch of the ling and häpuku/bass target fisheries;

b) Commercial catch of SCH 5 has averaged around 715 tonnes (only 3% above the TACC of 694 tonnes) over the last five fishing years. Catch exceeded the TACC four times in the past five fishing-years; and

c) A reasonable amount of stock assessment information is available for SCH 5 (biological, and CPUE information).

10 Furthermore, an AMP framework has additional advantages:

a) School shark is vulnerable to overfishing due to its biological characteristics. Management of SCH 5 under an AMP reduces the risk of overfishing as the proposed AMP has appropriate monitoring and reporting arrangements to detect changes in abundance; and

b) While the proposed TAC increase is unlikely to increase the risk of mortalities of marine mammals and seabirds, the additional monitoring required under an AMP will provide information on set net and trawl interactions with marine mammals and seabirds.

TAC

11 South East FML has proposed a 5% increase in the TACC of SCH 5 from 708 tonnes to 743 tonnes to determine the sustainability of the fishery at the increased catch level. This increase in TACC in SCH 5 is more precautionary than the 20% TACC increase proposals for SCH 3, 7 and 8 because South East FML is concerned that the fishery may have links with the seriously threatened Australian fishery.

12 Commercial catch of SCH 5 has averaged around 715 tonnes or slightly above (3%) the TACC over the last five fishing years. No quantitative assessment of the status of the SCH 5 stock relative to the stock level that would produce the MSY is available. Plenary agree that school shark is one biological stock within New Zealand waters and that all four school shark stocks, SCH 3, 5, 7, and 8, could be considered for inclusion in the AMP. Plenary consider that, although the SCH 5 stock size may be uncertain, there is reasonable probability that the SCH 5 stock has increased to a level at, near, or above $B_{msy.}$ Plenary's conclusion was based on the large decrease in catch since SCH 5 was introduced to the QMS in 1986 and flat CPUE indices, apart from a drop in the most recent fishing year, under recent catch levels above the TACC.

13 MFish considers that, while the proposed increase to the SCH 5 TAC may increase the risk of adverse impacts on the threatened Hector's dolphin, this increased risk is likely to be low. The SCH 5 fishery occurs offshore of the main habitat area of the dolphin (Te Wae Wae Bay) and, where fishing occurs, South East FML has measures (voluntary code of practice) to mitigate and report on impacts on Hector's dolphins. South East FML is also developing an independent monitoring programme based on video observations.

14 MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 5 fishery. South East FML is strongly encouraged to complete the video monitoring trials and to implement an appropriate monitoring programme as soon as possible. The SCH 5 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

15 In the absence of stock assessment information, proposed TACs for fisheries are usually based on known or estimated levels of recreational, Mäori customary, and commercial catch together with an estimate of all other sources of fishing-related mortality. In the absence of stock assessment information this is the best information available on which to set a TAC that maintains the stock at or above the level that can produce the maximum sustainable yield. The allowances proposed, including that for other sources of fishing-related mortality, are in addition to the TACC increase proposed by South East FML. Accordingly, the proposed TAC for SCH 5 has been derived by summing the proposed TACC under the AMP, together with estimates of recreational, Mäori customary harvests, and other sources of fishing-related mortality.

Monitoring

16 South East FML's monitoring of the proposed TACC increase under the AMP is intended to provide information to enable determination of the size, geographical extent and long-term sustainable yield of the SCH 5 stock. The TAC/TACC levels for SCH 5 can be reviewed if, on the balance of probabilities, it is determined that catch

under the AMP is causing the stock size to move below the level that will produce the MSY.

17 Given that independent information on relative abundance from trawl surveys is difficult to obtain for SCH 5, South East FML proposes to monitor the SCH 5 fishery using relative abundance CPUE indices for SCH 5 derived from set net fishing events that target any shark species (spiny dogfish, elephant fish and rig) or catch school shark. In addition, supplementary CPUE information and biological information (length and sex) will be obtained from logbooks placed on a representative selection of set net vessels targeting SCH 5.

18 Plenary agree that analysis of CPUE data from target set net fisheries recorded in MFish catch and effort logs could be used to monitor the SCH 5 stock and that the existing set net logbook programme for SCH 5 should be satisfactory to monitor the size frequency of the catch, provided an adequate level of coverage is maintained.

19 Plenary comment that the level of logbook coverage in the SCH 5 fishery has ranged from 9 to 54%, but only one vessel provided data in the most recent fishing year. MFish considers that the minimum level of logbook coverage required is around 30% of fishing effort (trips/sets/trawls). This level of coverage should be able to be achieved by South East FML as it represents over 90% of quota holders in SCH 5.

20 MFish considers that the monitoring (as agreed by the Plenary and with coverage of 30% of fishing effort) of commercial CPUE, a logbook scheme and collection of biological data should mitigate any risks to the sustainability of SCH 5 at the modestly (5%) increased TACC level which is about 3% above the average commercial catch of the last four fishing years but less than the 2002-03 fishing year catch.

21 Given the importance of the AMP monitoring to mitigating risks to sustainability of SCH 5 and possible impacts on marine mammals and seabirds, South East FML will be required to provide annual updates on their SCH 5 monitoring programme to MFish. These updates must include information on the amount of coverage of fishing effort in the fishery, logbook compliance, collection of biological information, and monitoring of fishing-related mortality (including development and implementation of an independent monitoring programme).

22 South East FML is also responsible for providing information, including CPUE and biological information, for a full review of the SCH 5 AMP at the AMP working group meetings in March 2007, when two years of data will be available, and in 2010 at the end of the 5 year programme.

TACC

23 The AMP proposal by South East FML is to increase the TACC of SCH 5 by 5% from 708 tonnes to 743 tonnes.

24 The increase to the SCH 5 TACC should have economic benefits in the short term. The port price was $1870 per tonne as at 30 September 2003, so that the 35 tonne increase in the TACC has a gross value of $65 450 domestically, without taking any account of export value. The actual economic benefit to industry will result from the

reduced deemed values penalties paid as a result of the increased TACC as recent catch levels have been around the level of the proposed TACC.

25 There should also be economic benefits that extend from cost-effective gathering of information from the fishery under the AMP. The information could result in improved assessment of the SCH 5 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery. However, the required monitoring will also increase costs above those present.

26 Longer-term benefits to the SCH 5 fishery will be dependent on future stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

27 As the SCH 5 TACC increase is to around commercial catch levels of the past four fishing years, there are unlikely to be increased adverse effects on other stocks within multistock fisheries.

Recreational and customary

28 The 1999-2000 (2000) survey of recreational catch of SCH 5 provides an estimate of between 2 and 11 tonnes and a point estimate of 7 tonnes. MFish considers that the best available estimate of the recreational catch of SCH 5 is probably around 7 tonnes. As discussed in Annex 2, it is likely that the 2000 estimate of 7 tonnes better represents the total annual landed recreational catch of school shark in SCH 5, at approximately 2 % of the commercial catch.

29 MFish proposes that the Minister set allowances for recreational fishers as outlined in the Statutory Obligations and Policy Guidelines section. The allowances proposed for recreational use of the school shark fishery reflect the likely level of fishing activity.

30 School shark (makohuarau) is a traditional Ngäi Tahu resource. It is widely distributed in the inshore zone, readily caught by traditional fishing methods, and highly prized as a food source. School shark is known to be of considerable importance to customary fishers in the South Island. MFish proposes that the Minister set an allowance for customary fishers, as outlined in the Statutory Obligations and Policy Guidelines section, at a catch level similar to the estimated recreational catch.

31 MFish considers that the proposed increase to the SCH 5 TACC is unlikely to affect the size and availability of school shark for non-commercial fishers as commercial fishers generally catch school shark further offshore outside the areas fished by non-commercial fishers.

32 MFish proposes that the allowances for recreational and customary harvest be set at 7 tonnes each.

Other sources of fishing-related mortality

33 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality. Most of the SCH 5 commercial catch is taken by set netting which usually has low levels of mortality and wastage.

34 MFish considers that an allowance should be made for incidental mortality of injured fish escaping from set nets and from the capture and release of undersize fish, as discussed in Annex 2. MFish proposes that the allowance for other sources of mortality caused by fishing be set at 5 % of the TACC proposed under the AMP programme, that is, 37 tonnes. The allowance proposed for other sources of fishing-related mortality is in addition to the TACC increase proposed by South East FML.

Future Management

35 The AMP for SCH 5 is to run for 5 years. The AMP will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two fishing years and again at the end of the five fishing years of the programme to determine if the AMP TACC is sustainable.

36 MFish will be undertaking further surveys to determine the levels of recreational catch (including SCH 5) over the next five years, and reporting of customary Mäori catch will continue under the reporting requirements of the Fisheries (South Island Customary Fishing) Regulations 1999. A research project[15] is underway to review the indices of relative abundance for school shark from existing commercial bycatch and target data, previous studies had concentrated on target fisheries only.

37 Depending on the outcome of the programme and revised estimates of non-commercial catches, MFish may propose the reconsideration of sustainability and utilisation measures for SCH 5 in 2007 and 2010.

38 A key consideration at the completion of the five-year period will be whether or not the TACC should revert back to the current level. The AMP is primarily intended as an information gathering mechanism to assess whether or not a stock is capable of providing a greater yield. The alternative to the AMP is that conventional stock assessment techniques are employed to assess the fisheries yield – these techniques do not necessarily involve an increase in the TAC and TACC.

Conclusion

39 The South East FML has proposed, under a new AMP, a 5% increase to the TACC for SCH 5 from 708 tonnes to 743 tonnes.

40 Plenary consider that, although the SCH 5 stock size may be uncertain, there is reasonable probability that the SCH 5 stock has increased to a level at, near, or above B_{msy}. Plenary's conclusion is based on the large decrease in catch since SCH 5 was introduced to the QMS in 1986 and flat CPUE indices, apart from a drop in the most recent fishing year, under recent catch levels above the TACC. Plenary has agreed that SCH 5 could be considered for inclusion in the AMP because CPUE is stable in the target set net fishery in SCH 5 and this may indicate increased abundance of school shark.

[15] Research Project HPB2002/01 Catch per unit effort analyses for school shark from bycatch and target fisheries in New Zealand, 1989-90 to 2001-02

41 The main objective of the proposal is to ascertain whether the SCH 5 stock is capable of sustaining higher catches consistent with the assumption that the stock is above the B_{MSY}.

42 MFish considers it has taken into account the statutory obligations required by the 1996 Act in evaluating this management proposal, as detailed in Annex 1.

43 MFish considers that the proposed increased SCH 5 TACC is unlikely to affect the size and availability of school shark for non-commercial fishers (customary Mäori and recreational) as school shark is mainly caught commercially offshore.

44 MFish considers that it is unlikely that the proposed increase to the SCH 5 TAC will significantly increase adverse impacts on the threatened Hector's dolphin as the fishery occurs offshore of the main habitat area of the dolphin (Te Wae Wae Bay) and, where fishing occurs, South East FML has measures (voluntary code of practice) to mitigate and report on impacts on Hector's dolphins. South East FML is also developing an independent monitoring programme based on video observations.

45 MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 5 fishery. South East FML is strongly encouraged to complete the video monitoring trials and to implement an appropriate monitoring programme as soon as possible. The SCH 5 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

Preliminary Recommendations

46 MFish proposes, under the Adaptive Management Programme, to include a new five-year programme for school shark in SCH 5 that will:

a) set the TAC at 794 tonnes;

b) make allowances of 7 tonnes for Mäori customary and recreational interests of 7 tonnes each;

c) make an allowance of 37 tonnes for other sources of fishing-related mortality;

d) increase the TACC by 5% from 708 tonnes to 743 tonnes;

e) require South East FML to implement a logbook programme and biological sampling in the SCH 5 fishery with the aim of covering at least 30% of fishing effort (trips/sets/trawls);

f) require South East FML to provide annual updates to MFish on the compliance with keeping of logbooks, collection of biological information, and monitoring of fishing-related mortality of marine mammals and seabirds;

g) require South East FML to provide full reports to the AMP Working Group and Plenary in 2007 and 2010, on standardised CPUE analysis for the SCH 5 fishery, biological information, and monitoring of fishing-related mortality; and

h) require South East FML to continue to implement measures to mitigate potential impacts of fishing on Hector's dolphins and seabirds. In particular,

require South East FML to implement an appropriate monitoring programme as soon as possible.

ANNEX ONE

Statutory Considerations

TAC

47 The purpose of the Act (s 8) is to provide for utilisation of fisheries resources while ensuring sustainability. Utilisation is defined in the Act as including development of fisheries resources. The AMP for SCH 5 is intended to provide a structured and monitored way to explore the developmental opportunities of the fishery, while ensuring sustainability. The increased TAC, allowances and TACC will provide for development of the fishery, and create the potential for people to better provide for their social, cultural, and economic well-being.

48 The TAC, under s 13, should be set to maintain the stock at, or move the stock towards or above, the level that can produce the MSY having regard to the interdependence of stocks. Plenary consider that, although the SCH 5 stock size may be uncertain, there is reasonable probability that the SCH 5 stock has increased to a level at, near, or above B_{msy}. Plenary's conclusion was based on the large decrease in catches upon introduction of this species to the QMS in 1986 and a flat CPUE trend under recent catch levels above the TACC, apart from a drop in the most recent fishing year.

49 A range of species is likely to be caught in the target set net fishery for SCH 5. The most significant commercial bycatch species in the SCH 5 target fisheries are rig, ling and häpuku/bass, 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 SCH 5 at this time (s 13 (2)(c)).

50 There should be economic benefits from the cost-effective gathering of information under the AMP. This information could result in improved assessment of the SCH 5 stock relative to the level that would produce the MSY. Improved assessment of the SCH 5 stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

51 Increasing the SCH 5 TACC, as proposed, will have economic benefits in the short term, but longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

52 SCH 5 is also taken as a bycatch in other target trawl and bottom longline fisheries. A higher TACC for SCH 5 may make it easier for fishers to obtain ACE to cover their bycatch of school shark as the increased TACC will generate more ACE.

53 MFish notes that this developmental opportunity creates potential for some economic benefits without creating any anticipated social, economic or cultural issues for other sectors (s 13 (3)).

54 SCH 5 does not appear to be subject to any significant fluctuation in biomass from year to year as catches have steadily risen in recent years. MFish is of the view that it is not necessary to take into account natural variability of when setting or varying the TAC/TACC or other allowances (s 11 (1)(c)).

Environmental

55 The Act includes statutory obligations to avoid, remedy, or mitigate any adverse effects of fishing on the aquatic environment when setting or reviewing a TAC.

56 Plenary note that 90% of the SCH 5 catch is taken by the target set net fishery. The remainder of SCH 5 is caught as a bycatch of trawl and line fisheries for other species.

57 Under the provisions of the Marine Mammals Act 1978, Hector's dolphin has been declared a threatened species. Plenary note that a small population of Hector's dolphins exists in the Te Wae Wae Bay area of SCH 5 and could be vulnerable to increased fishing activity. However, Plenary note that current catch levels of SCH 5 are at or near the proposed increase and the SCH 5 fishery occurs offshore rather than in Te Wae Wae Bay. In addition, Plenary note that South East FML's voluntary set net code of practice includes a number of measures to reduce the possibility of dolphin bycatch.

58 Given the Plenary conclusions and that the increased TACC is only 5% above the average annual catch of the last four fishing years, and less than last fishing years catch, MFish considers that it is unlikely that the proposed increase to the SCH 5 TAC and TACC will significantly increase adverse impacts on Hector's dolphins.

59 The Act, in s 9(a), requires that associated or dependent species (non-harvested species) should be maintained above a level that ensures their long-term viability is taken into account.

60 The SCH 5 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 AMP proposal notes that offal is typically discarded in this fishery after nets have been retrieved, as there are insufficient people on these vessels to retrieve the net and process the fish simultaneously. Thus, the potential for interactions with seabirds is reduced. The draft Seabird Interaction with Fisheries in the New Zealand Exclusive Zone - A Review and National Plan of Action 2000 document does not list school shark as one of the fisheries with seabird interactions that are of concern.

61 However, MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 5 fishery. South East FML is strongly encouraged to complete the video monitoring trials and to implement an appropriate monitoring programme as soon as possible. The SCH 5 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

62 The Act, in ss 9(b) and (c) respectively, requires that biological diversity of the aquatic environment should be maintained, and that habitats of particular significance to fisheries management should be protected. There are no other known impacts on biodiversity that would be specific to the SCH 5 fishery. MFish notes that there is no information on habitats of particular significance to the management of SCH 5.

Other statutory considerations

63 MFish considers that there are no issues arising under international obligations or the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 that are not adequately addressed in the management options proposed for SCH 5 (s 5(a)&(b)).

64 Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls under the Act which are required to be taken into account by s 11(1)(b) for SCH 5 include the following:

- A minimum net mesh size of 100 mm[1]; and
- A daily bag limit of 5[2] school shark for recreational fishers within a combined daily bag limit of 30 finfish.

65 While a fisheries plan may provide another mechanism through which to explore the potential of the SCH 5 fishery, no fisheries plan has been developed or approved to date (s 11 (2A)(b)).

66 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 this proposal for SCH 5. No decision has been made not to require a service in this fishery (s 11 (2A)(a&b)).

67 Before setting or varying any sustainability measure for SCH 5, the Minister must take into account any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991 and any management strategy or plan under the Conservation Act 1987.

68 Within SCH 5, there is only one Department of Conservation conservancy, Southland. This conservancy has produced a conservation management strategy under the Conservation Act which identifies a number of issues. The issues of significance to the SCH 5 fishery are: advocating for the sustainable use of marine fisheries, and promoting the protection of significant marine ecosystems from the adverse effects of fishing practices.

69 The proposed TAC/TACC increase under this AMP and the subsequent monitoring is designed to ensure that sustainable use of this resource is achieved, while carefully monitoring for any additional impacts on marine ecosystems or marine mammals. In the absence of a completed population management plan for Hector's dolphins, the use of acoustic pingers and the voluntary code of practice have been adopted by industry to reduce the possibility of dolphin mortalities associated with the commercial fishery (s 11(2)(a)). MFish and South East FML are also developing an appropriate programme to monitor the effects of fishing on marine mammals and seabirds in the SCH 5 fishery.

70 There is one Regional Council within SCH 5. Environment Southland which has a partially operational regional plan, as parts of their plan are subject to appeals to the

[1] Regulation 31(6) of the Fisheries(commercial fishing) Regulations2001
[2] Regulation 4(1) of the Fisheries (Southland and Sub-Antarctic Areas Amateur Fishing) Regulations 1999

Environment Court. The plan has been examined but there are no provisions applicable to the proposed TACC increase under this SCH 5 AMP (s 11(2)(b)).

71 The nature of the SCH 5 fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. No mätaitai reserves exist in SCH 5. No restrictions have been placed on fishing in any area within SCH 5 for recreational interests (s 21(1) (a & b), 4(i & ii), 5).

72 The information principles of the Act require that decisions be based on the best available information, take into account any uncertainty of this information, and apply 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.

73 MFish considers that the information used to evaluate the SCH 5 proposal is the best available. The stock information has been reviewed by the AMP Working Group and by Plenary. While it is recognised that the current status of the stock is uncertain, the monitoring criteria for the proposal will allow for improved information to be obtained. There is little information on marine mammal and seabird interactions with the SCH 5 fishery, and that information is uncertain. MFish does not believe that the uncertainty about the stock status is a reason to prevent the Minister from approving this AMP.

ANNEX TWO

Biological Characteristics

74 School sharks are distributed across the shelf, generally being inshore in summer and offshore in winter. They extend in decreasing numbers further offshore to at least 600 m depth. Capture of school sharks by tuna longliners shows their distribution extends well offshore, up to 180 nm off the South Island, and 400 nm off northern New Zealand towards the Kermadec Islands.

75 Breeding is not annual; it has generally been assumed to be biennial, but recent work on a Brazilian stock suggests that females have a three year cycle. Fecundity (pup numbers) increases from 5-10 in small females to over 40 in the largest. Mating is believed to occur in deep water, probably in winter. Release of pups occurs during spring and early summer (November-January), apparently earlier in the north of the country than in the south. Nursery grounds include harbours, shallow bays, and sheltered coasts. The pups remain in the shallow nursery grounds during their first one or two years and subsequently disperse across the shelf. The geographic location of the most important pupping and nursery grounds in New Zealand is not known.

76 Growth rates have not been estimated for New Zealand fish but in Australia and South America school sharks are slow growing and long-lived. They are difficult to age by conventional methods, but up to 45 vertebral rings can be counted. Growth is fastest for the first few years, slows appreciably between five and 15 years, and is negligible after 20 years.

77 Sexual maturity is estimated to occur at 12-17 years for males and 13-15 years for females. The size range of commercially-caught maturing and adult school shark is 90-170 total length (TL), with a broad mode at 110-130 cm TL, which varies with area, season, and depth.

78 The combination of late maturity, slow growth, and low fecundity gives low overall productivity. In Australia, natural mortality has been estimated at 0.10. Results from an Australian long-term tag recovery suggest a maximum age of at least 50 years.

79 New Zealand tagging studies have shown that school shark may move considerable distances, including trans-Tasman Ocean migrations. One school shark tagged in Australia has been recaptured in the SCH 5 area. But the majority of recaptures are in the same QMA. These tagging studies suggest that there is a single biological stock.

Catch Information

Commercial fisheries

80 The total commercial catch of school shark throughout the 1970s averaged about 550 tonnes due to modest demand for fillets by the Australian market. Development of the New Zealand and Australian markets, and the use of more efficient set nets, resulted in the catch rising rapidly to a national peak of nearly 4 000 tonnes in 1983.

81 Annual commercial catch of SCH 5 became significant only about 1980, rising rapidly to a peak around 1 000 tonnes in 1984-85 due to demand from New Zealand and Australian markets and the use of efficient set nets. The next fishing year, commercial catch declined to around 650 tonnes.

82 SCH 5 was introduced into the QMS in 1986 with a TACC of 610 tonnes (based on yield estimates derived from trawl surveys) to address declining catch rates and low productivity concerns.

83 Since 1986, commercial catch and total allowable commercial catch of SCH 5 have steadily increased, the latter by 14% as a result of quota appeals. Commercial catch of SCH 5 has averaged around 315 tonnes or slightly above (3%) the TACC over the last five fishing years.

84 The main target fishing method for SCH 5 is setnetting which catches 88% of the average SCH 5 catch. Almost all of the set net catch of SCH 5 is targeted with the remainder bycatch of the rig target fishery. Bycatch of the bottom trawl fisheries accounts for 7% of the average catch with stargazer the main target fishery. Longlining accounts for 4% of the catch which is mainly bycatch of the ling and häpuku/bass target fisheries.

85 The most important areas for taking SCH 5 vary by method; set netting is important in Areas 027 (south-east Stewart Island) and 030 (western Foveaux Strait), trawling is important in Area 030 (western Foveaux Strait), and hook & line is important in Areas 027 (south-east Stewart Island) and 030 (western Foveaux Strait).

Table 2: Reported landings (tonnes) and TACCs (tonnes) of school shark from SCH 5 from 1986–87 to 2001-02

Fishing Year	Landings (tonnes)	TACC (tonnes)
1986–87	382	610
1987–88	529	613
1988–89	494	615
1989–90	450	635
1990–91	480	649
1991–92	612	686
1992–93	593	686
1993–94	624	686
1994–95	656	694
1995–96	690	694
1996–97	662	694
1997–98	623	694
1998–99	714	694
1999–00	706	694
2000–01	724	694
2001–02	671	708
2002–03	764	708

86 Further commercial catch information can be found in the SCH 5 *Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 4 September 2003, produced by the South East Finfish Management Limited. This document can be viewed on the Ministry of Fisheries website at <<http://www.fish.govt.nz/sustainability/research/assessment/index.html>>. You will be asked for a username and a password. The username is: workinggroup; the password is: bluenose. Under '2003 Working Group Documents' the required document is listed as 'SCH 5 AMP Proposal'.

Recreational fisheries

87 Recreational fishing surveys have been undertaken in 1991-92, 1996, 1999-00, and 2000-01 to provide recreational harvest estimates. The MFish Recreational Fisheries Working Group, which met in October 2003, was satisfied with the general methodology of the 1999-00 survey and that the results from the 1999-00 survey, and the 2000-01 follow-up survey, were acceptable. It was noted that caution needs to be exercised with the interpretation of some figures, particularly for QMA 2 fishstocks, and where the coefficient-of-variation is high. The Working Group meeting concluded that the1999-00 survey and the 2000-01 follow-up survey generally should be used in preference to the earlier surveys.

Table 3: Estimated harvest of SCH 5 by recreational fishers from recreational fishing diary surveys

Survey	Fishstock	Point estimate (tonnes)	Range (tonnes)
1991-92	SCH 5		0-10
1996	SCH 5		-
1999-00	SCH 5	7	2-11
2000-01	TAR 3	NA	NA

88 The 1999-2000 (2000) survey of recreational catch of SCH 5 provides an estimate of between 2 and 11 tonnes and a point estimate of 7 tonnes. Information on SCH 5 recreational catch from the 2000-01 survey is not available at present. The 1991-92 survey result is similar to the 2000 survey. Therefore, it is likely that the 2000 survey point estimate of seven tonnes is representative of the total annual landed recreational catch of school shark in SCH 5, at approximately 1 % of the commercial catch.

Customary fisheries

89 Tangata tiaki have been appointed under the Fisheries (South Island Customary Fishing) Regulations 1999 for the SCH 5 area. No catch of SCH 5 has been reported by tangata tiaki. School shark, however, is known to be of considerable importance to customary fishers in the South Island.

Other sources of fishing-related mortality

90 No quantitative information is available on the level of illegal catch or other sources of fishing- related mortality. SCH 5 is mainly caught by set nets with small amounts caught as bycatch of trawl and long line fisheries.

91 There is likely to be an element of mortality associated with the set net and trawl fisheries that catch SCH 5 as a bycatch as some school shark that escape through the net will be fatally injured.

Existing controls

92 A minimum net mesh size of 100 mm for both commercial and recreational fishers.

93 The amateur daily bag limit in SCH 5 is five school shark for recreational fishing within a combined daily bag limit of 30 finfish.

94 There are a number of controls on fishing gear used by amateurs to catch SCH 5. The main controls on amateur fishers include only being able to use one small set net (less than 60m) and longlines must have less than 25 hooks.

95 Commercial fishers must service their nets within 18 hours and are only allowed to use nets less than 1 000 m in length and, generally, are not able to set more than 3 000 m of net each day.

Social, cultural and economic factors

96 School shark (makohuarau) is a traditional Ngai Tahu resource. It is widely distributed in the inshore zone, readily caught by traditional fishing methods, and highly prized as a food source.

97 School shark in SCH 5 is an important recreational fishery and is mainly caught by boat fishers in Southland waters.

98 SCH 5 quota is currently (Decemberr 2003) being traded at $6 832 per tonne, with ACE currently traded at $590 per tonne. There are 41 quota owners in the SCH 5 fishery, and 73 ACE holders with holdings ranging from 0.5 – >100 tonnes. There were 41 quota owners in the fishery, and 73 ACE holders, with ACE holdings ranging from 29 holders with less than 0.5 tonnes each to three holders with over 100 tonnes each. The port price was $1 870 per tonne, so that the 35 tonne increase in the TACC is valued at $ 65 450 domestically, without taking any account of export value.

Stock Assessment

99 The AMP Plenary in December 2003 agreed the following regarding the fit to the AMP stock assessment criteria for all school shark stocks.

Stock assessment criteria

100 The stock size may be uncertain, but based on a large decrease in catches upon introduction of this species to the QMS in 1986, and stable or possibly increasing CPUE indices under recent catch levels above the TACC, there is reasonable probability that these Fishstocks have increased to levels at, near or above B_{MSY}.

Monitoring criteria

101 The existing monitoring programme in SCH 3 and 5 from set net logbooks may be satisfactory to monitor the size frequency of the catch, provided adequate level of coverage is maintained. In SCH 7 and 8, the existing logbook programme needs to be expanded to cover school shark.

Decision rule criteria

102 A decision rule to review all information in 2007 after two years operation of the AMP was agreed.

Environmental considerations

103 Hector's dolphin populations are found throughout all the SCH fisheries proposed for the AMP increase. The use of pingers in some areas and adherence to voluntary codes

of practice are designed to reduce the possibility of mortalities associated with the commercial set net fishery. Video monitoring of the small vessel fishing fleet in QMAs 3 and 5 is being trialed as a potential monitoring methodology. There are not considered to be any likely increased impacts of fishing from the trawl fishery in these stocks.

Future Review

104 The AMPs will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two years and at the end of the five years of the programme.

Conclusions

105 The AMP Plenary agreed that all four SCH stocks could be considered for inclusion in the adaptive management programme. The stable or increasing CPUE in the target set net fisheries in SCH 3, 5, 7 and 8 may indicate increased abundance of school shark in these areas. The combined TACC for these stocks has been exceeded in three of the last four years whereas the TACCs were always under caught in the early 1990s.

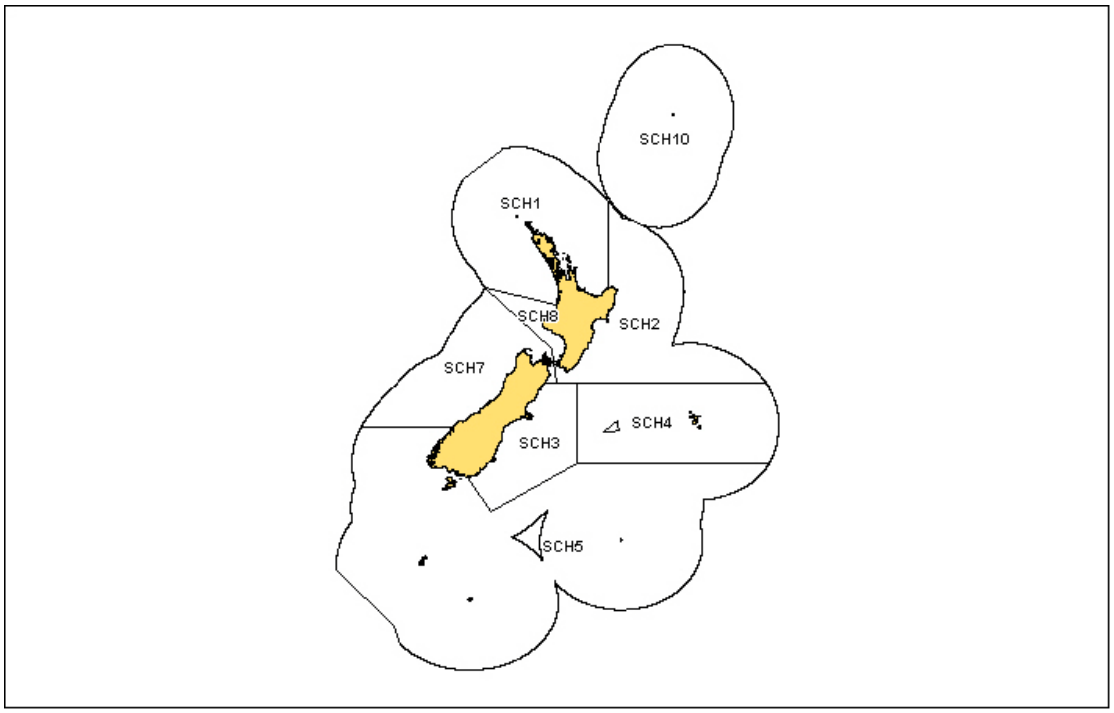
Research plan

106 There are a number of recent research projects that specifically relate to the SCH 5 fishery. These are:

- Carry out a stock assessment of school shark. 1. Estimate biomass and sustainable yields. *(SCH1999/01)*;
- Determine areas of habitat of importance to fisheries management within the NZ EEZ. 1a. Determine areas of important juvenile fish habitat. 1c. Determine areas of importance for shark populations for pupping or egg laying. *(ENV1999/03)*;
- Investigation of areas of habitat of particular significance for fisheries management within the New Zealand EEZ. 1. To map bryozoan-dominated epibenthic assemblages in Golden and Tasman Bay and the outer Marlborough Sounds. 2. To review the role and influence of frame-building bryozoans and associated seabed structure on epibenthic biodiversity and the life history of commercially valuable species and make research recommendations on how to formally assess this role *(ENV2001/13)*; and
- Estimating relative abundance from bycatch and target school shark fisheries. *(HPB2002/01).*

SCHOOL SHARK (SCH 7) AMP PROPOSAL – INITIAL POSITION PAPER

Figure 1. Map showing the boundaries of school shark quota management areas, including SCH 7.



Key Issues to be Considered

1 Key issues to be considered for the school shark (SCH 7) proposal are:

a) The Ministry of Fisheries (MFish) has received a proposal from the Challenger Finfisheries Management Company Limited (Challenger FMC) to increase the total allowable commercial catch (TACC) for SCH 7 by 20% from 534 tonnes to 641 tonnes for a five-year period from October 2004 under the adaptive management programme (AMP). The proposed increase to the SCH 7 TACC is based on increased abundance of school shark;

b) Commercial catch of SCH 7 has averaged around 539 tonnes or 1% above the TACC of 534 tonnes, over the last three fishing years. Over the past five fishing years, catches have averaged 588 tones or 10% above the TACC;

c) A significant part of the SCH 7 catch is taken by target set net and hook and line fisheries, while the bottom trawl catch of SCH 7 is primarily a bycatch of targeting barracouta;

d) The biological characteristics (late maturity, slow growth and low fecundity) of school shark make it likely to be susceptible to overfishing;

e) The December 2003 AMP Plenary (Plenary) agreed that school shark is one biological stock within New Zealand and that all four school shark stocks (SCH 3, 5, 7, and 8) could be considered for inclusion in the AMP;

f) The Plenary considers that although the school shark stock sizes may be uncertain there is reasonable probability that these New Zealand school shark stocks, including SCH 7, have increased to a level at, near, or above B_{MSY};

g) The SCH 7 fishery has not been managed under an AMP in the past, nor has an AMP been previously considered for the fishery; and

h) The SCH 7 AMP is being considered for a fishstock where there is a threatened population of Hector's dolphins. An increase in the TACC for SCH 7 may increase the risk of mortalities of marine mammals and sea birds.

Rationale for Management Options

Policy frameworks

2 When setting a TAC for SCH 7, a number of statutory obligations imposed by the Fisheries Act 1996 (the Act) have to be taken into account. These factors, which are considered before setting sustainability measures for SCH 7, are considered in detail in the Statutory Obligations and Policy Guidelines (Introductory Papers) and Annex 1.

3 The Plenary has agreed that SCH 7 should be considered for inclusion in the AMP. Only one option is proposed, a TACC increase under an AMP. MFish considers that an increase to the SCH 7 TACC is better addressed within an AMP than under the low knowledge bycatch fishery framework. SCH 7 does not meet the criteria for consideration of a TACC increase under the low knowledge bycatch fishery framework as:

a) A significant component (47%) of the total SCH 7 commercial catch is targeted. Most of the set net (72%) and hook & line (75%) catch of school shark is taken in target fishing for this species;

b) Commercial catches have only exceeded the TACC by 1% for the past three fishing years, and by 10% over the past five years; and

c) A reasonable amount of information is available for SCH 7 (biological, and CPUE) for stock assessment purposes compared, for example, to moonfish or ghost shark.

4 Furthermore, an AMP framework has additional advantages:

a) School shark is vulnerable to overfishing due to its biological characteristics. Management of SCH 7 under an AMP reduces the risk of overfishing as the proposed AMP has appropriate monitoring and reporting arrangements to detect changes in abundance; and

b) The proposed TACC increase may increase the risk of mortalities of marine mammals and seabirds. The additional monitoring required under the AMP will provide information on commercial fishing interactions with marine mammals and seabirds.

TAC

5 When varying a TACC for a quota management stock, the Act requires that a TAC be set under s 13 or s 14 and that, within the TAC, allowances are made for non-commercial fishing interests in that stock. MFish is proposing to set the TAC for SCH 7 under s 13 of the Act because the biological characteristics of school shark

allow an MSY to be estimated, commercial catch limits of SCH 7 are not part of any international agreement, and the fishery is not managed on a rotational or enhanced basis.

6 Challenger FMC proposed a 20% increase in the TACC for SCH 7 from 534 to 641 tonnes on the grounds that the stock appears to be stable or increasing under current catch levels.

7 SCH 7 was introduced into the QMS in 1986 with a TACC of 470 tonnes (less than half the peak commercial catch of 1 039 tonnes in the 1983-84 fishing year) to address declining catch rates and low productivity concerns. Since 1986, the TACC and commercial catch of SCH 7 have steadily increased, the former by some 13%, to 534 tonnes, as a result of quota appeals. The commercial catch of SCH 7 has averaged 539 tonnes, or 1% above the TACC, over the last three fishing years to 2002-03. It has averaged 588 tonnes, or 10% above the TACC, over the last five fishing years (as the catch exceeded the TACC by 20% or more for two of these years; 1998-99, 1999-00).

8 No quantitative assessment of the status of the SCH 7 stock relative to the stock level that would produce the MSY is available. The Plenary agreed that school shark is one biological stock within New Zealand and that all four school shark stocks (SCH 3, 5, 7, and 8) could be considered for inclusion in the AMP. The Plenary concluded that, although these school shark stock sizes, including the SCH 7 stock, may be uncertain, there is reasonable probability that these stocks have increased to a level at, near, or above B_{MSY}. The Plenary's conclusion was based on the large decrease in catches upon introduction of this stock to the QMS in 1986, and stable or possibly increasing CPUE indices under recent catch levels above the TACC.

9 The extent of the proposed TACC increase is primarily intended to ascertain whether the SCH 7 stock is capable of sustaining higher catches consistent with the assumption that the stock is above the B_{MSY}. The increase in TACC in SCH 7 is consistent with the proposed increases in other school shark stocks. The TAC/TACC levels for SCH 7 can be reviewed if, on the balance of probabilities, it is detected that the catches under the AMP are causing the stock size to move below the level that will produce the MSY.

10 The SCH 7 AMP is being considered for a fishstock where there is a population of Hector's dolphins that is listed as a threatened species under the Marine Mammals Act 1978 (see Annex 1). The proposed 20% increase in the TACC from 534 to 641 tonnes does represent a genuine increase in fishing effort and in catch, as the average catch has only been 539 tonnes over the past three fishing years, and therefore poses an increased risk to Hector's dolphin. It is not possible to quantify this increased risk.

11 Despite the increased risk from the additional fishing effort that will occur with the increased TACC, MFish considers the risk to Hector's dolphin and seabirds is probably low as:

- Challenger FMC has introduced the voluntary use of pingers and a code of practice for commercial set netters in 2001-02[3]. The code of practice includes a range of measures to reduce the possibility of Hector's dolphin mortalities;
- Set net fishing targeting school shark under the AMP will tend to be in offshore waters, beyond the main distribution of Hector's dolphins within our nautical miles of the Westland coast (see Annex 1);
- Offal is not disposed of during net retrieval, as there are insufficient people on these vessels to retrieve the net and process the fish simultaneously (see Annex 1); and
- The trawl fishery also has prohibited fishing zones close inshore that will assist in mitigating the risk of further entanglements of Hector's dolphin (see Annex 1).

12 MFish also notes that 30% of the SCH 7 catch is taken in a hook and line fishery, where there may be increased risk of entangling seabirds.

13 In the absence of stock assessment information, proposed TACs for fisheries are usually based on known or estimated levels of recreational, Mäori customary, and commercial catch together with an estimate of all other sources of fishing-related mortality. In the absence of stock assessment information, this is the best information available on which to set a TAC that maintains the stock at or above the level that can produce the maximum sustainable yield. The allowances proposed, including that for other sources of fishing-related mortality, are in addition to the TACC increase proposed by Challenger FMC. Accordingly, the proposed TAC of 789 tonnes for SCH 7 has been derived by collating the proposed TACC, under the AMP, with estimates of recreational, Mäori customary harvests, and other sources of fishing-related mortality.

Monitoring - stock issues

14 Given that stock abundance indices from independent trawl surveys are difficult to obtain for SCH 7, Challenger FMC proposes to derive SCH 7 relative abundance CPUE indices from set net fishing events that target any shark species (spiny dogfish, elephant fish and rig) or catch school shark. In addition, supplementary CPUE information and biological information (length and sex) will be obtained from logbooks placed on a representative selection of set net vessels in SCH 7.

15 The Plenary agreed that the analysis of CPUE data from the shark set net fisheries recorded in MFish catch and effort logs could be used to monitor the SCH 7 stock, and that the existing set net logbook programme needs to be expanded to cover school shark. The Plenary agreed that the programme should be satisfactory to monitor the size frequency of the catch provided an adequate level of coverage with logbooks is maintained.

[3] Further information on the impacts of fishing and code of practice are to be found in the *SCH 7 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 13 November 2003, produced by the Challenger Finfish Management Company Limited. This document can be accessed on the Ministry of Fisheries website, as detailed in Annex 2.

16 MFish notes that the set net fishery takes 33%, the hook & line fishery 30%, and the trawl bycatch fishery 37% of the total SCH 7 catch. MFish considers that monitoring CPUE of both the set net target fishery and the substantial trawl bycatch fishery is necessary. This is needed to reduce the risk to the sustainability of SCH 7 at the increased TACC level as it is possible for a target fishery to maintain catch rates while abundance is declining.

17 School shark is vulnerable to overfishing, and, to provide a representative picture of the SCH 7 fishery, MFish considers that the logbook scheme for SCH 7 should monitor at least 30% of both sets and trawls. Monitoring 30% of both the target set netting and the non-target trawling, rather than the 25% of catch as proposed by Challenger FMC, should provide good information on where target fishing is occurring and size composition of catches for both target and non-target components of the fishery.

18 Challenger FMC claim to represent quota holders totalling 256 tonnes or 66% of the total SCH 7 quota. This is a lower representation than South East Finfish Management Ltd, for example, who represent over 90% of quota holders in both SCH 3 and SCH 5, two other school shark stocks under consideration for AMPs. There is an existing set net logbook scheme in FMA 7. With the reasonable representation Challenger FMC has of quota owners, and as there is an existing logbook scheme, it should be possible to monitor at least 30% of both sets and trawls.

19 MFish considers that the monitoring (as agreed by the Plenary and with coverage of 30% of both set net and trawl fishing effort) of commercial CPUE, a logbook scheme and collection of biological data should detect any risks to the sustainability of SCH 7 at the increased TACC level.

Monitoring – Hector's dolphins/seabirds

20 Challenger FMC reports that there appears to be little interaction between the fishery and seabirds. Challenger FMC has monitored sightings of Hector's dolphin in the set net and trawl fisheries with a 'Multi Species Log Book' since 1 October 2000. MFish considers that Challenger FMC should expand this programme to report sightings of Hector's dolphin in the line fishery and to report any seabird capture in all SCH 7 fisheries.

21 MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 7 fishery. Challenger FMC is strongly encouraged to take account of the video monitoring trials in QMA 3 (being undertaken by South East Finfish Management Company Ltd) and, depending on results, consider implementing an appropriate monitoring programme.

22 Given the importance of the AMP monitoring to detecting risks to sustainability of SCH 7 and possible impacts on marine mammals and seabirds, Challenger FMC will be required to provide annual updates on their SCH 7 monitoring programme to MFish. These updates must include information on the amount of coverage of fishing effort in the fishery, logbook compliance, collection of biological information, and monitoring of fishing-related mortality.

23 Challenger FMC is also responsible for providing information, including CPUE and biological information, for a full review of the SCH 7 AMP at the AMP working

group meetings in March 2007, when two years of data will be available, and in 2010, at the end of the five year programme.

Monitoring – proposed requirements

24 MFish proposes the following requirements for monitoring of the AMP; that Challenger FMC will:

a) implement a logbook programme to monitor at least 30% of both sets and trawls to provide high spatial resolution for SCH 7 catch and effort;

b) implement collection of SCH 7 biological information (length, sex) from at least 30% of both sets and trawls monitored by the logbook programme;

c) maintain a existing voluntary code of practice to reduce the risk of Hector's dolphin or seabird bycatch and to continue to implement measures to mitigate potential impacts for marine mammals and seabirds in the SCH 7 fishery;

d) maintain the existing 'Multi Species Log Book' in the set net and trawl fisheries that accommodate the reporting of sightings of Hector's dolphins in the SCH 7 fishery. MFish proposes that this programme should be expanded to include the line fishery, and also reports of any seabird capture;

e) analyse standardised CPUE on the MFish commercial fisheries catch & effort database for shark set net fisheries and non-target trawl fisheries taking school shark in SCH 7;

f) provide annual updates to MFish on the amount of coverage of fishing effort in the fishery, logbook compliance, collection of biological information, and monitoring of fishing-related mortality; and

g) provide full reports to the AMP Working Group and Plenary, in 2007 and 2010, on standardised CPUE analysis for the SCH 7 fishery, biological information, and monitoring of fishing-related mortality.

TACC

25 The AMP proposal by Challenger FMC is to increase the TACC of SCH 7 by 20% from 534 tonnes to 641 tonnes.

26 There should be economic benefits that extend from this cost-effective gathering of information from the fishery. The information could result in improved assessment of the SCH 7 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

27 Increasing the SCH 7 TACC, as proposed, has economic costs because of the required monitoring. The increase also has economic benefits in the short term. The port price was $1 732.30 per tonne (as at 30 September 2003), so that the 107 tonne increase in the TACC has a gross value of $185 000, domestically, without taking any account of export value. In addition, there will be economic benefits to industry from the lower total cost of deemed values paid.

28 But, longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

29 MFish considers that the proposed increase to the SCH 7 TACC is unlikely to affect the size and availability of school shark for non-commercial fishers as there are significant areas of inshore coastline, where SCH 7 is available to non-commercial fishers, that are either closed or restricted to certain types of commercial fishing that are targeting school shark (for example, significant areas of the Marlborough Sounds, and Golden and Tasman Bays).

Customary and recreational

30 The estimated recreational harvest for SCH 7 was 58 tonnes in the 1999-00 recreational fishing survey, with a range of 26 – 91 tonnes (see Annex 2).

31 MFish proposes that the Minister set allowances for recreational fishers, as outlined in the Statutory Obligations and Policy Guidelines section. The allowances proposed for recreational use of the school shark fishery reflect the likely level of fishing activity.

32 School shark (makohuarau) is a traditional Ngai Tahu resource. It is readily caught by traditional fishing methods in the inshore zone, and highly prized as a food source.

33 Tangata tiaki have only recently been appointed under the Fisheries (South Island Customary Fishing) Regulations 1999 for most of the SCH 7 area. No catch of SCH 7 has been reported by tangata tiaki. As school shark is known to be of importance to Mäori, MFish proposes that the Minister set an allowance for customary fishers, as outlined in the Statutory Obligations and Policy Guidelines section, at a catch level similar to the known recreational catch.

34 MFish proposes that the allowances for recreational and customary harvest be set at 58 tonnes each.

Other sources of fishing-related mortality

35 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality.

36 Most of the SCH 7 catch is taken by target set net and hook & line fisheries, and as a bycatch of trawl fisheries for other species. MFish considers that an allowance should be made for incidental mortality of injured fish escaping from trawl and set nets. In addition, there is an unknown amount of unreported offshore trawl and pelagic longline catch of school shark, and there is also an unknown discarded bycatch of juvenile, mainly first-year, school shark taken in harbour and bay set nets, as discussed in Annex 2.

37 MFish proposes that the allowances for other sources of mortality caused by fishing be set at 5% of the TACC proposed under the AMP, that is, 32 tonnes. The allowance proposed for other sources of fishing-related mortality is in addition to the TACC increase proposed by Challenger FMC.

Future Management

38 The AMP programme for SCH 7 is proposed to run for five years. The SCH 7 AMP will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two years and at the end of the programme.

39 MFish will be undertaking further surveys to determine the levels of recreational catch (including SCH 7) over the next five years, and estimates of customary Mäori catch may also be available from reporting required under the customary fishing regulations. A research project[4] is underway to review the indices of relative abundance for school shark from existing commercial bycatch and target data, previous studies had concentrated on target fisheries only.

40 Depending on the outcome of the programme, stock assessment, and revised estimates of non-commercial catches, MFish may propose the reconsideration of sustainability and utilisation measures for SCH 7.

41 A key consideration at the completion of the five-year period will be whether or not the TACC should revert back to the current level. The AMP is primarily intended as an information gathering mechanism to assess whether or not a stock is capable of providing a greater yield. The alternative to the AMP is that conventional stock assessment techniques are employed to assess the fisheries yield. These techniques do not necessarily involve an increase in the TAC and TACC.

Conclusion

42 The Challenger FMC has proposed a 20% increase in the TACC for SCH 7 from 534 tonnes to 641 tonnes under a new AMP.

43 The Plenary consider that, although the school shark stock sizes may be uncertain, there is reasonable probability that the New Zealand school shark stocks, including SCH 7, have increased to a level at, near, or above B_{MSY}. The Plenary concluded that SCH 7 should be considered for inclusion in an AMP as the stable or increasing CPUE in the target set net fisheries in SCH 7 may indicate increased abundance of school shark.

44 The main objective of the proposal is to ascertain whether the SCH 7 stock is capable of sustaining higher catches consistent with the assumption that the stock is above the B_{msy}.

45 MFish considers it has taken into account the statutory obligations required by the 1996 Act in evaluating this management proposal, as detailed in Annex 1.

46 MFish considers that the proposed increase to the SCH 7 TACC is unlikely to affect the size and availability of school shark for non-commercial fishers as there are significant areas of inshore coastline, where SCH 7 is available to non-commercial fishers, that are either closed or restricted to certain types of commercial fishing that are targeting school shark (for example, significant areas of the Marlborough Sounds, Golden and Tasman Bays).

47 Irrespective of catch levels, the previous Minister has encouraged set net fishers in SCH 7 to develop and implement set net codes of practice. Challenger FMC's adoption of a set net code of practice, and use of pingers, is likely to mitigate their fishing impacts on Hector's dolphin, other marine mammals, and seabirds. MFish is of the view that the proposed increase in the TACC does increase the risk of further mortalities of marine mammals and seabirds. However, taking into account the

[4] Research Project HPB2002/01: Catch per unit effort analyses for school shark from bycatch and target fisheries in New Zealand, 1989-90 to 2001-02

mitigation measures and the probable separation of target school shark fishing and Hector's dolphins, this increased risk is likely to be low.

48 MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 7 fishery. Challenger FMC is strongly encouraged to take account of the video monitoring trials in QMA 3 and, depending on results, to consider implementing an appropriate monitoring programme.

Preliminary Recommendations

49 MFish proposes, under the AMP, to include a new five-year programme for school shark in SCH 7 that will:

a) set the TAC for SCH 7 at 789 tonnes;

b) provide a 58 tonne allowance for customary fishing;

c) provide a 58 tonne allowance for recreational fishing;

d) set the allowance for other sources of fishing-related mortality at 32 tonnes;

e) increase the TACC from 534 tonnes to 641 tonnes;

f) require Challenger FMC to implement an logbook programme and biological sampling (length, sex) in the SCH fishery, with at least 30% of both sets and trawls being monitored;

g) require Challenger FMC to maintain an existing voluntary code of practice and to continue to implement measures to reduce the risk of Hector's dolphin or seabird bycatch;

h) require Challenger FMC to maintain an existing 'Multi Species Log Book' of set net and trawl fisheries that accommodates the reporting of sightings of Hector's dolphins, but is expanded to include the line fishery, and any capture of seabirds in the SCH 7 fishery;

i) require Challenger FMC to analyse standardised CPUE on the MFish commercial fisheries catch & effort database for shark set net fisheries and non-target trawl fisheries taking school shark in SCH 7;

j) require Challenger FMC to provide annual updates to MFish on the compliance with keeping of logbooks, collection of biological information, and monitoring of fishing-related mortality; and

k) require Challenger FMC to provide full reports to the AMP Working Group and Plenary in 2007 and 2010, on standardised CPUE analysis for the SCH 7 fishery, biological information, and monitoring of fishing-related mortality.

ANNEX ONE

Statutory Considerations

TAC

50 The purpose of the Act, set out in s 8, is to provide for utilisation of fisheries resources while ensuring sustainability. Utilisation is defined in the Act as including development of fisheries resources. The AMP for SCH 7 is intended to provide a structured and monitored way to explore the developmental opportunities of the fishery, while ensuring sustainability. The increased TACC, and setting of allowances, will provide for development of the fishery and create the potential for people to better provide for their social, cultural, and economic well-being.

51 The TAC should be set, under s 13, to move the stock towards or above the level that can produce MSY. The Plenary agreed that school shark is one biological stock within New Zealand and that although the stock sizes in all four school shark stocks (SCH 3, 5, 7, and 8) may be uncertain there is reasonable probability that these stocks have increased to a level at, near, or above B_{msy}. The Plenary's conclusion was based on the large decrease in catches upon introduction of this stock to the QMS in 1986, and stable or possibly increasing CPUE indices under recent catch levels above the TACC. The Plenary also concluded that annual monitoring and review under the AMP would mitigate the risks to sustainability under the proposed increased catch levels.

52 A range of species is likely to be caught in the trawl fishery that takes school shark as a bycatch in SCH 7. The most significant commercial species taken in the SCH 7 fishery are barracouta, hoki, flatfish, and tarakihi, 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 SCH 7 at this time (s 13(2)(b)(1)).

53 There should be economic benefits that extend from the cost-effective gathering of information from the fishery. This information could result in improved assessment of the SCH 7 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

54 Increasing the SCH 7 TAC, as proposed, will have economic benefits in the short term, but longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

55 School shark are also taken as a bycatch in other target trawl and set net fisheries. A higher TACC for SCH 7 might make it easier for fishers to obtain the ACE to cover their bycatch of school shark.

56 MFish notes that this developmental opportunity creates potential for greater economic benefits without creating any anticipated social, economic or cultural issues for other sectors (s 13(3)).

57 SCH 7 does not appear to be prone to significant fluctuations in biomass from year to year. MFish is of the view that there is no natural variability to take into account when setting or varying the TAC/TACC or other allowances (s 11(1)(c)).

Effects of fishing/environmental considerations

58 The adverse effects on the aquatic environment of the management measures must be taken into account when considering the proposed TAC and TACC.

59 The Plenary noted that most of the SCH 7 catch is taken by the target set net and line fishery, and as a bycatch of trawl fisheries for other species.

60 Under the provisions of the Marine Mammals Act 1978, Hector's dolphin is listed as a threatened species. The Plenary considered interactions between Hector's dolphin and the SCH 7 fishery. The west coast of the South Island has the largest resident population of Hector's dolphin (approximately 5 400 individuals), which overlaps with the SCH 7 set net fishery. The Plenary noted that Challenger FMC had introduced the voluntary use of pingers and a code of practice for commercial set netters in 2001-02[5]. The code of practice includes a range of measures to reduce the possibility of Hector's dolphin mortalities, such as nets not being deployed when dolphins are around the vessels, nets to be recovered as rapidly as possible, nets to be set as tight as possible to avoid loose mesh and enveloping patterns.

61 MFish notes that only 5 tonnes (5%) of the proposed 107 tonne increase in the TACC (from 534 to 641 tonnes) has been taken on average in the three most recent fishing years. Therefore, the proposed TACC increase will represent a genuine increase in fishing effort and in catch. There have been 5 mortalities of Hector's dolphins[6] attributed to set netting over the past few years (commencing the 2000-01 fishing year) on the west coast of the South Island, particularly near Hokitika, Greymouth, and Westport.

62 The most important area for commercial set netting for school shark occurs in Areas 034-035 (Kahurangi Point – Abut Head (just south of Hokitika)). Fishers targeting school shark, by set netting, fish further offshore than they do for rig or elephantfish. Though there is a school shark bycatch in the inshore rig fishery, increased targeting of school shark under the AMP will tend to be in offshore waters, beyond the main distribution of Hector's dolphins within 4 nautical miles of the Westland coast. This should assist in reducing the risk of further entanglements of Hector's dolphins.

63 The Plenary considered that it was unlikely that an increased SCH 7 TACC would result in any new areas being fished. In addition, the plenary noted that video monitoring of the small vessel fishing fleet in QMA 3 is being trialed as a potential monitoring methodology for fishing-related mortalities.

64 MFish also notes that 30% of the SCH 7 catch is taken in a target hook and line fishery (mainly in Area 017, eastern Cook Strait), where there may be increased impacts on seabirds.

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[5] Further information on the impacts of fishing and the code of practice are to be found in the *SCH 7 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 13 November 2003, produced by the Challenger Finfish Management Company Limited. This document can be accessed on the Ministry of Fisheries website, as detailed in Annex 2.

[6] A total of 25 Hector's dolphin carcases have been recovered in this period, 12 carcases were too decomposed to allow the cause of death to be determined

65 The SCH fishery does not dispose of any significant amount of fish waste or offal at sea. The AMP proposal also notes that offal is typically discarded in this fishery after nets have been retrieved as there are insufficient people on these vessels to retrieve the net and process the fish simultaneously. Thus, the potential for interactions with seabirds is reduced. The draft Seabird Interaction with Fisheries in the New Zealand Exclusive Zone - A Review and National Plan of Action 2000 does not list school shark as one of the fisheries that are of concern with seabird interactions.

66 Challenger FMC reports that there appears to be little interaction between the SCH 7 school shark line fishery and seabirds. MFish notes that voluntary code of practice in SCH 7 requires the reporting of any dolphin captures, and MFish considers that this should be expanded to include any seabird captures.

67 Trawling is prohibited in many inshore areas and harbours in Marlborough Sounds, Tasman and Golden Bays, and in Whanganui Inlet. These measures will assist in mitigating the risk of entanglements in those areas. Moreover, the Plenary considered that the increased TACC would not result in additional areas being trawled.

68 These factors, taken together, suggest that the proposed increase in the TACC does increase the risk of mortalities of marine mammals and seabirds. The extent of this increased risk is unknown. Given that SCH 7 set netting is offshore and offal is not disposed of during net retrieval, it is probable that the increased risk is low. Reporting of bycatch and protected species will allow for information to be collected to advance our knowledge of the impacts.

69 However, MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 7 fishery. Challenger FMC is strongly encouraged to take account of the video monitoring trials in QMA 3 and, depending on the results, to consider implementing an appropriate monitoring programme.

70 The Act requires a decision maker to consider the principles that biological diversity of the aquatic environment should be maintained and that habitats of particular significance to fisheries management should be protected (s 9).

71 MFish notes that Separation Point, in Tasman Bay, is closed to trawling as a measure to avoid the adverse effects of fishing on the unique bryozoan biodiversity there. A number of habitats of particular significance to fisheries management are closed by regulation, including most of the close inshore bay and harbour areas in Marlborough Sounds, Tasman Bay, Whanganui Inlet. This will protect inshore breeding and nursery areas of small sharks.

Other statutory considerations

72 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers that all issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for SCH 7 (s 5(a) & (b)).

73 Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls under the 1996 Act for SCH 7 include the following:

- A minimum net mesh size of 150 mm for both commercial and recreational fishers[7];
- School shark is one of the species that is included within a combined daily bag limit of 20 finfish for recreational fishing in SCH 7[8];
- There are a number of controls on fishing gear used by amateurs to catch SCH 7. The main controls on amateur fishers include only being able to use one small set net (less than 60m)[9] and longlines must have less than 25 hooks[10];
- Trawling is prohibited in many inshore areas and harbours in the Marlborough Sounds, Tasman and Golden Bays, and Whanganui Inlet:
    - Trawling is prohibited in part of Golden Bay from 1 November to 30 April[11];
    - Trawling is prohibited in Greville Harbour, Nelson Harbour, Waimea Inlet, Whanganui Inlet[12];
    - Trawling is prohibited in Queen Charlotte Sound, and trawling is prohibited in parts of Pelorus Sound from 1 September to 31 March[13];
    - Trawling is prohibited for vessels greater than 20 metres length in Port Underwood[14]; and
    - Trawling is prohibited on Separation Point[15].
- Trawling by vessels over 46 metres length is prohibited within the Territorial Waters[16];
- Commercial finfishing is prohibited in Croisilles Harbour[17];
- There are prohibitions in some areas, and restrictions placed on types of set netting that can be undertaken, in many inshore areas and harbours in the Marlborough Sounds, Tasman and Golden Bays, and Whanganui Inlet:
    - No recreational set nets (apart from flounder nets) from 1 October to 31 March in inner Queen Charlotte Sound, parts of Pelorus Sound, Croisilles Harbour[18];
    - No commercial set nets greater than 1000 m length, in Port Underwood, Queen Charlotte Sound, parts of Pelorus Sound, Admiralty Bay, Catherine Cove, Port Hardy, Greville Harbour, Manawhakapakapa Harbour, Croisilles Harbour, Nelson Harbour, Waimea Estuary, Wainui Bay, Whanganui Harbour[19]; and

[7] Regulation 3B, Fisheries (Challenger Area Amateur Fishing) Regulations 1986; Regulation 2A, Fisheries (Challenger Area Commercial Fishing) Regulations 1986
[8] Regulation 2B, Fisheries (Challenger Area Amateur Fishing) Regulations 1986
[9] Regulation 12, Fisheries (Amateur Fishing) Regulations 1986
[10] Regulation 15, Fisheries (Amateur Fishing) Regulations 1986
[11] Regulation 5, Fisheries (Challenger Area Commercial Fishing) Regulations 1986
[12] Regulation 6A, Fisheries (Challenger Area Commercial Fishing) Regulations 1986
[13] Regulation 7, Fisheries (Challenger Area Commercial Fishing) Regulations 1986
[14] Regulation 8A, Fisheries (Challenger Area Commercial Fishing) Regulations 1986
[15] Regulation 10, Fisheries (Challenger Area Commercial Fishing) Regulations 1986
[16] Regulation 47A, Fisheries (Commercial Fishing) Regulations 1986
[17] Regulation 2D, Fisheries (Challenger Area Commercial Fishing) Regulations 1986
[18] Regulation 4A, Fisheries (Challenger Area Recreational Fishing) Regulations 1986
[19] Regulation 2B, Fisheries (Challenger Area Commercial Fishing) Regulations 1986

- Commercial fishers must service their nets within 24 hours[20] (s 11(1)(b)).

74 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, and any relevant fisheries plan approved under Part III of the Act. MFish does not consider that existing or proposed services materially affect this proposal for SCH 7. There is no decision to not require a service in this fishery.

75 A fishery plan could provide another mechanism through which to explore the potential of the SCH 7 fishery, however, a fishery plan has not been developed or approved to date (s 11(2A)(a), (b), & (c)).

76 Before setting or varying any sustainability measure for SCH 7, the Minister must take into account any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987.

77 Within SCH 7, there are two Department of Conservation conservancies (Nelson/Marlborough, and Westland) that have produced conservation management strategies under the Conservation Act 1987. These strategies identify a number of issues of significance to the SCH 7 fishery such as advocating for the sustainable use of marine fisheries and promoting the protection of significant marine ecosystems from the adverse effects of fishing practices.

78 The proposed TACC increase under this AMP and the subsequent monitoring is designed to ensure that sustainable use of the SCH 7 resource is achieved without creating additional impacts on marine ecosystems or marine mammals. In the absence of a completed population management plan, the use of pingers, and the voluntary code of practice have been adopted by industry to reduce the possibility of dolphin mortalities associated with the commercial fishery (s 11(2)(a)).

79 There are no provisions known to exist in any policy statement or plan under the Resource Management Act 1991 that are relevant to setting the proposed TACC increase under this SCH 7 AMP (s 11(2)(b)).

80 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. A taiapure, Whakapuaka (Delaware Bay) Taiapure, exists in the QMA. No restrictions have been placed on fishing in any area within the QMA for recreational interests using the provisions in s 311 (s 21(1)(a) & (b), 4(i) & (ii), (5)).

81 The information principles of the Act require that decisions be based on the best available information, take into account any uncertainty of this information, and apply 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.

82 MFish considers that the information used to support the SCH 7 proposal is the best available. The stock information has been reviewed by the AMP Working Group and by Plenary. While it is recognised that the current status of the stock is uncertain, the

[20] Regulation 2BB, Fisheries (Challenger Area Commercial Fishing) Regulations 1986

monitoring criteria for the proposal will allow for improved information to be obtained, and for caution to be applied when using new information (s 10). There is little information on marine mammal and seabird interactions with the SCH 7 fishery, and that information is uncertain. MFish does not believe that the uncertainty about the stock status is a reason to prevent the Minister from approving this AMP.

ANNEX TWO

Biological Characteristics

83 School sharks are distributed across the shelf, generally being inshore in summer and offshore in winter. They extend in smaller numbers near the seafloor, down the upper continental shelf, to at least 600 m depth. Capture of school sharks by tuna longliners shows their distribution extends well offshore, up to 180 nm off the South Island, and 400 nm off northern New Zealand towards the Kermadec Islands.

84 Breeding is not annual; it has generally been assumed to be biennial, but recent work on a Brazilian stock suggests that females have a three year cycle. Fecundity (pup numbers) increases from 5-10 in small females to over 40 in the largest. Mating is believed to occur in deep water, probably in winter. Release of pups occurs during spring and early summer (November-January), apparently earlier in the north of the country than in the south. Nursery grounds include harbours, shallow bays, and sheltered coasts. The pups remain in the shallow nursery grounds during their first one or two years and subsequently disperse across the shelf. The geographic location of the most important pupping and nursery grounds in New Zealand is not known.

85 Growth rates have not been estimated for New Zealand fish but in Australia and South America school sharks are slow-growing and long-lived. They are difficult to age by conventional methods but up to 45 vertebral rings can be counted. Growth is fastest for the first few years, slows appreciably between five and 15 years, and is negligible after 20 years.

86 Sexual maturity is estimated to occur at 12-17 years for males and 13-15 years for females. The size range of commercially caught maturing and adult school shark is 90-170 total length (TL), with a broad mode at 110-130 cm TL, which varies with area, season, and depth.

87 The combination of late maturity, slow growth, and low fecundity gives low overall productivity. In Australia, natural mortality (M) has been estimated at 0.10. Results from an Australian long-term tag recovery suggest a maximum age of at least 50 years.

88 New Zealand tagging studies have shown that school shark may move considerable distances, including trans-Tasman Ocean migrations. But the majority of recaptures are in the same QMA. These tagging studies suggest that there is a single biological stock.

Catch Information

Commercial fisheries

89 The total commercial catch of school shark throughout the 1970s averaged about 550 tonnes due to modest demand for fillets by the Australian market. Development of the New Zealand and Australian markets, and the use of more efficient set nets, resulted in the catch rising rapidly to a national peak of over 4 000 tonnes in 1983.

90 Following a peak of 1 039 tonnes in SCH 7 (in 1983-84), the commercial catch in this quota management area declined rapidly over the next three fishing years to 454 tonnes. SCH 7 was introduced into the QMS in 1986 with a total allowable commercial catch (TACC) of 470 tonnes (less than half the commercial catch of the 1983-84 fishing year) to address declining catch rates and low productivity concerns.

91 Since 1986, the TACC and commercial catch of SCH 7 have steadily increased, the former by some 13% to 534 tonnes as a result of quota appeals. The commercial catch of SCH 7 has averaged 539 tonnes, or 1% above the TACC, over the last three fishing years to 2002-03. It has averaged 588 tonnes, or 10% above the TACC, over the last five fishing years (as the catch exceeded the TACC by 20% or more for two of these years; 1998-99, 1999-00).

92 In SCH 7, three methods feature in the total SCH 7 landings; trawling (37% of the school shark landings), set netting (33%), and hook & line (30%). School shark are taken as a bycatch of the major west coast South Island trawl fisheries, targeting particularly barracouta (45% of the trawl catch of school shark), but also hoki, flatfish, and red cod. The set net fisheries are almost exclusively targeting shark species; school shark (72% of the set net catch), rig, and spiny dogfish. The hook & line fishery is mainly targeting school shark (75% of the hook & line catch).

Table 2: Reported landings (tonnes) and TACCs (tonnes) of tarakihi from SCH 7 from 1986–87 to 2001-02

Year	Landings (tonnes)	TACC (tonnes)
1986–87	454	470
1987–88	516	500
1988–89	540	522
1989–90	516	524
1990–91	420	531
1991–92	431	531
1992–93	482	531
1993–94	473	531
1994–95	370	534
1995–96	638	534
1996–97	545	534
1997–98	468	534
1998–99	682	534
1999–00	639	534
2000–01	576	534
2001-02	500	534
2002-03	541	534

93 The most important areas for taking school shark vary by method; trawling is important in Areas 017 (eastern Cook Strait) and 034 (Greymouth coastline), set netting is important in Areas 034-035 (Greymouth - Westport coastlines), and hook & line is important in Area 017 (eastern Cook Strait).

94 Further commercial catch information can be found in the *SCH 7 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 13 November 2003, produced by the Challenger Finfish Management Company Limited. This document can be viewed on the Ministry of Fisheries website at <<http://www.fish.govt.nz/sustainability/research/assessment/index.html>>. You will be asked for a username and a password. The username is: workinggroup; the password

is: bluenose. Under '2003 Working Group Documents' the required document is listed as 'SCH 7 AMP Proposal'.

Customary Mäori fisheries

95 Mäori fishers made extensive use of school shark (makohuarau) in pre-European times for food, oil, and skin.

96 School shark is a traditional customary fisheries resource as it is readily caught by traditional fishing methods in the inshore zone, and highly prized as a food source. Tangata tiaki have only recently been appointed under the Fisheries (South Island Customary Fishing) Regulations 1999 for most of the SCH 7 area. No catch of SCH 7 has been reported by tangata tiaki.

Recreational fisheries

97 Recreational fishing surveys have been undertaken in 1991-92, 1996, 1999-00, and 2000-01 to provide recreational harvest estimates. The MFish Recreational Fisheries Working Group meeting in October 2003 was satisfied with the general methodology of the 1999-00 survey and that the results from the 1999-00 survey, and the 2000-01 follow-up survey, were acceptable. It was noted that caution needs to be exercised with the interpretation of some figures, particularly for QMA 2 fishstocks, and where the coefficient-of-variation is high. The Working Group meeting concluded that the1999-00 survey and the 2000-01 follow-up survey generally should be used in preference to the earlier surveys.

Table 3: Estimated harvest of school shark in SCH 7 by recreational fishers from recreational fishing diary surveys (NA = not available)

Survey	Fishstock	Point estimate (tonnes)	Range (tonnes)
1992-93	SCH 7		15 - 50
1996	SCH 7	16	5 - 25
1999-00	SCH 7	58	26 - 91
2000-01	SCH 7	NA	NA

98 The estimates for the 1992-93 and 1996 surveys were lower than the 1999-00 survey. The estimate for SCH 7 in the 1999-00 survey was 58 tonnes, with a range of 26 – 91 tonnes (Table 3). No estimate for SCH 7 is currently available from the 2000-01 survey. The 1996 estimate of 58 tonnes is the best available estimate of recreational harvest in SCH 7.

99 Based on the above recreational fishing surveys, boat fishers mainly catch school shark using set nets and handlines.

Other sources of fishing-related mortality

100 No quantitative information is available on the level of illegal catch. There is an unknown amount of unreported offshore trawl and pelagic longline catch of school shark, either landed (under another name, or in "mixed") or discarded. There is an unknown discarded bycatch of juvenile, mainly first-year, school shark taken in harbour and bay set nets.

101 Most of the SCH 7 catch is taken by the target set net and hook & line fisheries and as a bycatch of trawl fisheries for other species. There will be an element of mortality associated with school shark that might escape through trawl and set nets, but be fatally injured. Quantitative information is not available on these sources of mortality.

Social, cultural and economic factors

102 School shark is a valued kaimoana species for tangata whenua on the north and west coasts of the South Island. No school sharks have been recorded as being taken under authorisations for customary food gathering.

103 School shark is a significant target species for recreational fishers in SCH 7.

104 SCH 7 quota was being traded at $13 921.68 per tonne (as at 30 September 2003), with ACE traded at $1 127.50 per tonne. There were 77 quota owners in the fishery and 138 ACE holders, with ACE holdings ranging from 66 holders with less than 0.5 tonnes each to one holder with more than 50 tonnes. The port price was $1732.30 per tonne, so that the 107 tonne increase in the TACC is valued at $185 000 domestically, without taking any account of export value.

Stock Assessment Information

105 The Plenary, in December 2003, evaluated the stock assessment criteria, decision-rules, and monitoring programme of the SCH 7 AMP proposal (dated 13 November 2003) as part of the review required for proposed AMP fishstocks. The Plenary report for SCH 7 follows:

106 The AMP Plenary reviewed a proposal from the Challenger FMC to increase the TACC for SCH 7 by 20% from 534 tonnes to 641 tonnes. In this stock, catches are taken as bycatch of the bottom trawl fishery as well as in set net and line fisheries. The TACC was exceeded in 3 of the last 4 years. The CPUE indices for set net on all shark species in QMA 7 were evaluated. Successful sets showed an increase in catch rate. A decreasing proportion of zero sets over the period made the binomial and combined indices increase sharply, beginning from 1995-96.

SCH 7 monitoring

107 The analysis of CPUE data from the target shark set net fisheries recorded in MFish catch and effort logs will be used to monitor this Fishstock. A sampling programme using voluntary logbooks will be added to the current programme existing in the inshore QMA 7 set net and bottom longline fisheries.

Effects of fishing

108 Most of the catch is taken by the target shark set net fishery and as bycatch of the trawl and line fisheries for other species. An increased TACC would not result in any new areas being fished by the trawl fishery. The west coast South Island has a resident population of Hector's dolphin, which overlaps with the SCH 7 set net fishery. In 2001-02, CFMC introduced the voluntary code of practice for commercial set net fishers. This includes a range of measures to reduce the possibility of dolphin bycatch.

Review of new AMP proposals for SCH fishstocks

109 The AMP Plenary in December 2003 agreed with the following regarding the fit to the AMP stock assessment criteria for all school shark fishstocks:

Stock assessment criteria

110 The stock size may be uncertain, but based on:

a) a large decrease in catches upon introduction of this species to the QMS in 1986 and

b) stable or possibly increasing CPUE indices under recent catch levels above the TACC;

111 There is a reasonable probability that these fishstocks have increased to levels at, near or above B_{MSY}.

Monitoring criteria

112 The existing monitoring programme in SCH 3 and 5 from set net logbooks may be satisfactory to monitor the size frequency of the catch, provided adequate level of coverage is maintained. In SCH 7 and 8, the existing logbook programme needs to be expanded to cover school shark.

Decision-rule criteria

113 A decision-rule to review all information in 2007 after two years operation of the AMP was agreed.

Environmental considerations

114 Hector's dolphin populations are found throughout all the school shark fisheries proposed for the AMP increase. The use of pingers in some areas and adherence to voluntary codes of practice are designed to reduce the possibility of mortalities associated with the commercial set net fishery. Video monitoring of the small vessel fishing fleet in QMAs 3 and 5 is being trialed as a potential monitoring methodology. There are not considered to be any likely increased impacts of fishing from the trawl fishery in these stocks.

Future review

115 The AMPs will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two years and at the end of the five years of the programme.

Conclusions

116 The AMP Plenary agreed that all four school shark stocks could be considered for inclusion in the AMP. The stable or increasing CPUE in the target set net fisheries in SCH 3, 5, 7, and 8 may indicate increased abundance of school shark in these areas. The combined TACC for these stocks has been exceeded in three of the last four years, whereas the TACCs were always under caught in the early 1990s.

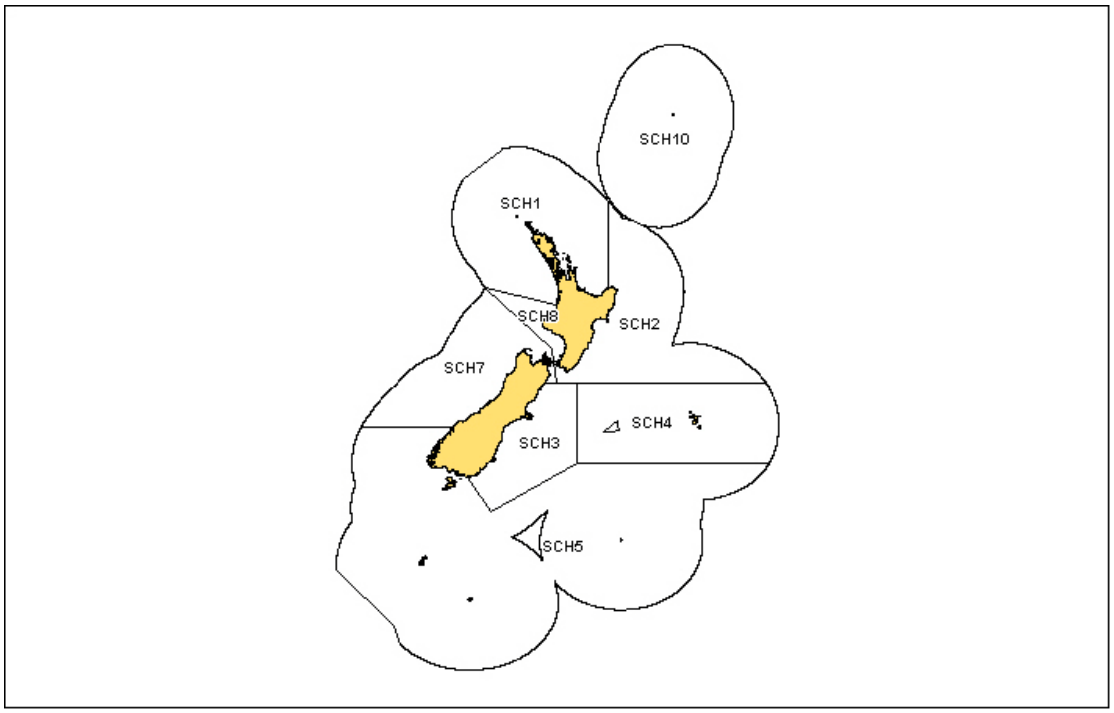
Research plan

117 There are a number of recent research projects that relate to the SCH 7 fishery. These are:

- Carry out a stock assessment of school shark. 1. Estimate biomass and sustainable yields *(SCH1999/01);*
- Determine areas of habitat of importance to fisheries management within the NZ EEZ. 1a. Determine areas of important juvenile fish habitat. 1c. Determine areas of importance for shark populations for pupping or egg laying *(ENV1999/03);*
- Investigation of areas of habitat of particular significance for fisheries management within the New Zealand EEZ. 1. To map bryozoan-dominated epibenthic assemblages in Golden and Tasman Bay and the outer Marlborough Sounds. 2. To review the role and influence of frame-building bryozoans and associated seabed structure on epibenthic biodiversity and the life history of commercially valuable species and make research recommendations on how to formally assess this role *(ENV2001/13)*; and
- Estimating relative abundance of school shark from target and bycatch fisheries *(HPB2002/01).*

SCHOOL SHARK (SCH 8) AMP PROPOSAL – INITIAL POSITION PAPER

Figure 1. Map showing the boundaries of school shark quota management areas, including SCH 8.



Key Issues to be Considered

1 Key issues to be considered for the school shark (SCH 8) proposal are:

a) The Ministry of Fisheries (MFish) has received a proposal from the Challenger Finfisheries Management Company Limited (Challenger FMC) for a new adaptive management programme (AMP) in SCH 8. Challenger FMC propose that the total allowable commercial catch (TACC) for SCH 8 be increased by 20% from 441 tonnes to 529 tonnes for a five-year period from October 2004 under an AMP;

b) The commercial catch of SCH 8 has averaged 454 tonnes or 3% over the TACC for the three most recent fishing years to 2002-03. It has averaged 473 tonnes, or 7% above the TACC, over the last five fishing years;

c) A significant part of the SCH 8 catch is taken by target set net fishing and bottom longline, while the bottom trawl catch of SCH 8 is primarily a bycatch of targeting gurnard, trevally, and tarakihi;

d) The biological characteristics (late maturity, slow growth and low fecundity) of school shark make it likely to be susceptible to overfishing;

e) The December 2003 AMP Plenary (Plenary) agreed that school shark is one biological stock within New Zealand and that all four school shark stocks (SCH 3, 5, 7, and 8) could be considered for inclusion in the AMP;

f) The Plenary considers that although the school shark stock sizes may be uncertain there is reasonable probability that these New Zealand school shark stocks, including SCH 8, have increased to a level at, near, or above B_{MSY};

g) The SCH 8 fishery has not been managed under an AMP in the past, nor has an AMP been previously considered for the fishery;

h) Challenger FMC represents a lower proportion of the quota holdings in SCH 8 than the proponents of other school shark AMPs under consideration. MFish is seeking confirmation by Challenger FMC of their ability to commit SCH 8 fishers to the required monitoring conditions of the AMP; and

i) The SCH 8 AMP is being considered for a fishstock where there is a small, critically endangered, population of Maui's dolphins. An increase in the TACC for SCH 8 may increase the risk of mortalities of marine mammals and sea birds.

Management Options

2 The proposed management option for the total allowable catch (TAC), TACC, and allowances for SCH 8 under the AMP framework is presented in Table 1.

Table 1: Proposed AMP management framework option for TAC/TACC increase for SCH 8

Programme	Proposed TAC (tonnes)	Customary allowance (tonnes)	Recreational allowance (tonnes)	Other sources of mortality (tonnes)	Proposed TACC (tonnes)	%TACC increase
Adaptive Management Programme	597	21	21	26	529	20

3 The proposal from the Challenger FMC is to establish an AMP for SCH 8 for five years beginning 1 October 2004 that will increase the TACC from 441 tonnes to 529 tonnes. Challenger FMC will:

a) analyse standardised relative abundance indices using catch and effort data from the target shark set net fisheries operating in the SCH 8 area;

b) establish a logbook programme to provide high spatial resolution for set net SCH 8 catch and effort information;

c) obtain SCH 8 biological information (length, sex) from the shark set net fishery logbook programme; and

d) maintain an existing voluntary code of practice to reduce the risk of Hector's dolphin and seabird bycatch in the SCH 8 fishery.

4 While reviewing the SCH 8 TACC, MFish proposes to set allowances for Mäori customary non-commercial interests, recreational interests, and other sources of fishing-related mortality. These allowances are in addition to the TACC increase proposed by Challenger FMC.

Rationale for Management Options

Policy frameworks

5 When setting a TAC for SCH 8, a number of statutory obligations imposed by the Fisheries Act 1996 (the Act) have to be taken into account. These factors, which are considered before setting sustainability measures for SCH 8, are considered in detail in the Statutory Obligations and Policy Guidelines section (see Introductory Papers) and Annex 1.

6 The Plenary has agreed that SCH 8 could be considered for inclusion in the AMP. Only one option is proposed, a TACC increase under an AMP. MFish considers that an increase to the SCH 8 TACC is better addressed within an AMP than under the low knowledge bycatch fishery framework. SCH 8 does not meet the criteria for consideration of a TACC increase under the low knowledge bycatch fishery framework as:

a) A significant component (45%) of the total SCH 8 commercial catch is targeted. Most set net fishing is targeting sharks (43% of the school shark in the set net fishery is taken when targeting school shark, and 48% is taken when targeting rig), while the bulk of the hook & line catch is school shark (88%) taken in target fishing for this species;

b) Commercial catches have only exceeded the TACC by 3% for the past three fishing years, and by 7% over the past five years; and

c) A reasonable amount of information is available for SCH 8 (biological, and CPUE) for stock assessment purposes compared, for example, to moonfish or ghost shark.

7 Furthermore, an AMP framework has additional advantages:

a) School shark is vulnerable to overfishing due to its biological characteristics. Management of SCH 8 under an AMP reduces the risk of overfishing as the proposed AMP has appropriate monitoring and reporting arrangements to detect changes in abundance; and

b) The proposed TACC increase may increase the risk of mortalities of marine mammals and seabirds. The additional monitoring required under the AMP will provide information on commercial fishing interactions with marine mammals and seabirds.

TAC

8 When varying a TACC for a quota management stock, the Act requires that a TAC be set under s 13 or s 14 and that, within the TAC, allowances are made for non-commercial fishing interests in that stock. MFish is proposing to set the TAC for SCH 8 under s 13 of the Act because the biological characteristics of school shark allow an MSY to be estimated, commercial catch limits of SCH 8 are not part of any international agreement, and the fishery is not managed on a rotational or enhanced basis.

9 Challenger FMC proposed a 20% increase in the TACC for SCH 8 from 441 to 529 tonnes on the grounds that the stock appears to be stable or increasing under current catch levels.

10 SCH 8 was introduced into the QMS in 1986 with a TACC of 310 tonnes, which rose rapidly to the current level of 441 tonnes as a result of quota appeals. The commercial catch of SCH 8 has averaged 454 tonnes or 3% over the TACC for the three most recent fishing years to 2002-03. It has averaged 473 tonnes, or 7% above the TACC, over the last five years.

11 No quantitative assessment of the status of the SCH 7 stock relative to the stock level that would produce the MSY is available. The Plenary agreed that school shark is one biological stock within New Zealand and that all four school shark stocks (SCH 3, 5, 7, and 8) could be considered for inclusion in the AMP. The Plenary concluded that although these school shark stock sizes, including the SCH 8 stock, may be uncertain there is reasonable probability that these stocks have increased to a level at, near, or above B_{MSY}. The Plenary's conclusion was based on the large decrease in catches upon introduction of this stock to the QMS in 1986, and stable or possibly increasing CPUE indices under recent catch levels above the TACC.

12 The Plenary noted that, in SCH 8, CPUE indices fluctuated throughout the period since 1989-90, with an increase in the last two years.

13 The extent of the proposed TACC increase is primarily intended to ascertain whether the SCH 8 stock is capable of sustaining higher catches consistent with the assumption that the stock is above the B_{MSY}. The increase in TACC in SCH 8 is consistent with the proposed increases in other school shark stocks. The TAC/TACC levels for SCH 8 can be reviewed if, on the balance of probabilities, it is detected that the catches under the AMP are causing the stock size to move below the level that will produce the MSY.

14 The SCH 8 AMP is being considered for a fishstock where there is a small population of Maui's dolphins that is listed as a threatened species under the Marine Mammals Act 1978, and is listed as critically endangered by the International Union for Conservation of Nature and Natural Resources (IUCN) (see Annex 1). The proposed 20% increase in the TACC from 441 to 529 tonnes does represent a genuine increase in fishing effort and in catch as the average catch has only been 454 tonnes over the past three fishing years, and therefore, poses an increased risk to Maui's dolphin. It is not possible to quantify this increased risk.

15 MFish also notes that 22% of the SCH 8 catch is taken in a hook & line fishery where there may be increased risk of entangling seabirds.

16 Despite the increased risk from the additional fishing effort that will occur with the increased TACC, MFish considers the risk to Maui's dolphin and seabirds is probably low as:

- Challenger FMC has introduced the voluntary use of pingers and a code of practice for commercial set netters in 2001-02[21]. The code of practice includes a range of measures to reduce the possibility of Maui's dolphin mortalities;

[21] Further information on the impacts of fishing and code of practice are to be found in the *SCH 7 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 13 November 2003, produced by the Challenger Finfish Management Company Limited. This document can be accessed on the Ministry of Fisheries website, as detailed in Annex 2.

- Set net fishing targeting school shark under the AMP will tend to be spatially separated from Maui's dolphin distribution, by being in offshore waters, beyond the main distribution of Hector's dolphins within 4 nautical miles of the Taranaki coast, and at the outer margin of the distribution of Maui's dolphin (see Annex 1);

- Offal is not disposed of during net retrieval, as there are insufficient people on these vessels to retrieve the net and process the fish simultaneously (see Annex 1); and

- Trawling and Danish seining are banned, either by regulation or voluntary closure, within one or two nautical miles of most of the coastline of QMA 8 and this will assist in mitigating the risk of further entanglements of Maui's dolphin (see Annex 1).

17 In the absence of stock assessment information, proposed TACs for fisheries are usually based on known or estimated levels of recreational, Mäori customary, and commercial catch together with an estimate of all other sources of fishing-related mortality. In the absence of stock assessment information this is the best information available on which to set a TAC that maintains the stock at or above the level that can produce the maximum sustainable yield. The allowances proposed, including that for other sources of fishing-related mortality, are in addition to the TACC increase proposed by Challenger FMC. Accordingly, the proposed TAC of 597 tonnes for SCH 8 has been derived by collating the proposed TACC, under the AMP, with estimates of recreational, Mäori customary harvests, and other sources of fishing-related mortality.

Monitoring - stock issues

18 Given that fisheries-independent trawl survey information is difficult to obtain for SCH 8, Challenger FMC proposes to derive SCH 8 relative abundance CPUE indices from set net fishing events that target six shark species (school shark, rig, elephant fish, spiny dogfish, northern spiny dogfish, or 'other dogfish') or catch school shark. In addition, supplementary CPUE information and biological information (length and sex) will be obtained from a proposed logbook programme. Logbooks will be placed on a representative selection of inshore set net vessels in SCH 8.

19 The Plenary agreed that the analysis of CPUE data from the target shark set net fisheries recorded in MFish catch and effort logs could be used to monitor the SCH 8 stock. The Plenary noted that the logbook programme should be expanded to include the line as well as the set net fishery. The Plenary agreed that the logbook programme should be satisfactory to monitor the distribution, sex, and size frequency of the catch provided an adequate level of coverage with logbooks is obtained.

20 MFish notes that the set net fishery takes 67%, the hook & line fishery 22%, and the trawl fishery 11% of the total SCH 8 catch. MFish agrees that monitoring the CPUE and biological information from the set net and line fishery in SCH 8 should be satisfactory to monitor the state of the school shark stock.

21 School shark is vulnerable to overfishing. To provide a representative picture of the SCH 8 fishery, MFish considers that the logbook scheme for SCH 8 should monitor at least 30% of both set net and line fishing events. Monitoring 30% of the set net and

line fishing events, rather than the 25% of catch as proposed by Challenger FMC, should provide better information on where target fishing is occurring and size composition of catches.

22 Challenger FMC claim to represent quota holders totalling 256 tonnes or 58% of the total SCH 8 quota. This is a comparatively low representation compared with other school shark AMPs. For SCH 7, Challenger FMC represents 66% of the quota holding, and South East Finfish Management Ltd represents over 90% of quota holders in both SCH 3 and SCH 5.

23 Challenger FMC proposes a voluntary logbook programme and collection of biological information for monitoring the SCH 8 AMP. There is no existing set net logbook scheme in FMA 8. It is unknown how quota holders, and particularly those who depend on ACE trades, will meet these monitoring conditions for the AMP. MFish is seeking confirmation by Challenger FMC of their ability to commit SCH 8 fishers to the required monitoring conditions of the AMP.

24 Fish considers that the monitoring (as agreed by the Plenary and with coverage of 30% of set net and line fishing effort) of commercial CPUE, a logbook scheme and collection of biological data should mitigate any risks to the sustainability of SCH 8 at the increased TACC level.

Monitoring – Maui's dolphins/seabirds

25 Challenger FMC reports that there appears to be little interaction between the fishery and seabirds. MFish recommends that the school shark line fishery establish a system for reporting of any seabird capture.

26 MFish considers that it would also be desirable for Challenger FMC to monitor the QMA 8 set net, line and trawl fisheries with a 'Multi Species Log Book' that accommodates the reporting of sightings of Maui's dolphins by number, location (latitude and longitude), and activity of dolphins at the time of sighting, and also any captures of seabirds (similar to that which operates in QMA 7 for monitoring Hector's dolphin).

27 MFish considers that the codes of practice and monitoring are key factors to mitigating Maui's dolphin and seabird interactions associated with the TACC increase. MFish considers that the monitoring in SCH 8 should be similar, or exceed, that required for SCH 3 or SCH 7. It is unknown how quota holders, and particularly those who depend on ACE trades, will meet these monitoring conditions for the AMP.

28 Fish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 8 fishery. Challenger FMC is also strongly encouraged to take account of the video monitoring trials in QMA 3 (being undertaken by South East Finfish Management Company Ltd) and, depending on results, implement an appropriate monitoring programme as soon as possible. The SCH 8 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

Monitoring – proposed requirements

29 MFish proposes the following requirements for monitoring of the AMP; that Challenger FMC will:

a) implement a logbook programme to monitor at least 30% of both set and line fishing events to provide high spatial resolution for SCH 8 catch and effort;

b) implement collection of SCH 8 biological information (length, sex) from at least 30% of both set and line fishing events monitored by the logbook programme;

c) maintain a existing voluntary code of practice to reduce the risk of Maui's dolphin or seabird bycatch and to continue to implement measures to mitigate potential impacts for marine mammals and seabirds in the SCH 8 fishery;

d) implement a 'Multi Species Log Book' for set net, line, and trawl fisheries in SCH 8 that accommodates the reporting of sightings of Maui's dolphins and any seabird capture;

e) analyse standardised CPUE on the MFish commercial fisheries catch & effort database for shark set net and line fisheries taking school shark in SCH 8;

f) provide annual updates to MFish on the amount of coverage of fishing effort in the fishery, logbook compliance, collection of biological information, and monitoring of fishing-related mortality (including progress with developing an independent monitoring programme); and

g) provide full reports to the AMP Working Group and Plenary, in 2007 and 2010, on standardised CPUE analysis for the SCH 8 fishery, biological information, and monitoring of fishing-related mortality.

TACC

30 The AMP proposal by Challenger FMC is to increase the TACC of SCH 8 by 20% from 441 tonnes to 529 tonnes.

31 There should be economic benefits that extend from this cost-effective gathering of information from the fishery. The information could result in improved assessment of the SCH 8 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

32 Increasing the SCH 8 TACC, as proposed, has economic costs because of the required monitoring. The increase also has economic benefits in the short term. The port price was $1 752.10 per tonne (as at 30 September 2003), so that the 88 tonne increase in the TACC has a gross value of $154 000, domestically, without taking any account of export value. In addition, there will be economic benefits to industry from a reduction in the total cost of deemed values paid.

33 But, longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

34 MFish considers that the proposed increase to the SCH 8 TACC is unlikely to affect the size and availability of school shark for non-commercial fishers as school shark is not a significant target species for non-commercial fishers in the area, and the target

commercial fishery occurs on the edge of the continental shelf, which lies well offshore in SCH 8.

Customary and recreational

35 The estimated recreational harvest for SCH 8 was 21 tonnes in the 1996 recreational fishing survey, with a range of 15 -25 tonnes (see Annex 2).

36 MFish proposes that the Minister set allowances for recreational fishers as outlined in the Statutory Obligations and Policy Guidelines section. The allowances proposed for recreational use of the school shark fishery reflect the likely level of fishing activity.

37 School shark (makohuarau) is a traditional Mäori customary resource. It is readily caught by traditional fishing methods in the inshore zone, and highly prized as a food source.

38 No quantitative estimate is available for customary catch of SCH 8. Tangata tiaki have not been appointed under the Fisheries (Kaimoana Customary Fishing) Regulations 1998 for the SCH 8 area. As school shark is known to be of importance to Mäori, MFish proposes that the Minister set an allowance for customary fishers, as outlined in the Statutory Obligations and Policy Guidelines section, at a catch level similar to the known recreational catch.

39 MFish proposes that the allowances for recreational and customary harvest be set at 21 tonnes each.

Other sources of fishing-related mortality

40 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality.

41 Most of the SCH 8 catch is taken by target set net and bottom longline fisheries, and as a bycatch of trawl fisheries for other species. MFish considers that an allowance should be made for incidental mortality of injured fish escaping from trawl and set nets. In addition, there is an unknown amount of unreported offshore trawl and pelagic longline catch of school shark, as discussed in Annex 2.

42 MFish proposes that the allowances for other sources of fishing-related mortality be set at 5% of the TACC proposed under the AMP, that is, 26 tonnes. The allowance proposed for other sources of fishing-related mortality is in addition to the TACC increase proposed by Challenger FMC.

Future Management

43 The AMP programme for SCH 8 is proposed to run for five years. The SCH 8 AMP will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two years and at the end of the programme.

44 MFish will be undertaking further surveys to determine the levels of recreational catch (including SCH 8) over the next five years, and estimates of customary Mäori catch might also be available from reporting under the customary fishing regulations. A

research project[22] is underway to review the indices of relative abundance for school shark from existing commercial bycatch and target data, previous studies had concentrated on target fisheries only.

45 Depending on the outcome of the programme, stock assessment, and revised estimates of non-commercial catches, MFish may propose the reconsideration of sustainability and utilisation measures for SCH 8.

46 A key consideration at the completion of the five-year period will be whether or not the TACC should revert back to the current level. The AMP is primarily intended as an information gathering mechanism to assess whether or not a stock is capable of providing a greater yield. The alternative to the AMP is that conventional stock assessment techniques are employed to assess the fisheries yield. These techniques do not necessarily involve an increase in the TAC and TACC.

Conclusion

47 The Challenger FMC has proposed, under a new AMP, a 20% increase in the TACC for SCH 8 from 441 tonnes to 529 tonnes.

48 The Plenary consider that, although the school shark stock sizes may be uncertain, there is reasonable probability that the New Zealand school shark stocks, including SCH 8, have increased to a level at, near, or above B_{msy}. The Plenary concluded that SCH 8 should be considered for inclusion in an AMP as the stable or increasing CPUE in the target set net fisheries in SCH 8 may indicate increased abundance of school shark.

49 The main objective of the proposal is to ascertain whether the SCH 8 stock is capable of sustaining higher catches consistent with the assumption that the stock is above the B_{MSY}.

50 MFish considers it has taken into account the statutory obligations required by the 1996 Act in evaluating this management proposal, as detailed in Annex 1.

51 MFish considers that the proposed increase to the SCH 8 TACC is unlikely to affect the size and availability of school shark for non-commercial fishers as school shark is not a significant target species for non-commercial fishers in the area, and the target commercial fishery occurs on the edge of the continental shelf, which lies well offshore in SCH 8.

52 Irrespective of catch levels, the previous Minister of Fisheries has encouraged set net fishers in SCH 8 to develop and implement set net codes of practice. Challenger FMC's adoption of a voluntary set net code of practice, and use of pingers, is likely to mitigate their fishing impacts on Maui's dolphin, other marine mammals, and seabirds. MFish is of the view that the proposed increase in the TACC does increase the risk of further mortalities of marine mammals and seabirds. However, taking into account the mitigation measures and the probable separation of the target school shark fishing and Maui's dolphins, this increased risk is likely to be low.

53 MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 8 fishery. Challenger FMC is also strongly

[22] Research Project HPB2002/01: Catch per unit effort analyses for school shark from bycatch and target fisheries in New Zealand, 1989-90 to 2001-02

encouraged to take account of the video monitoring trials in QMA 3 and, depending on results, implement an appropriate monitoring programme as soon as possible. The SCH 8 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

Preliminary recommendations

54 Fish proposes, under the AMP, to include a new five-year programme for school shark in SCH 8 that will:

a) set the TAC for SCH 8 at 597 tonnes;

b) allow 21 tonnes for customary fishing;

c) allow 21 tonnes for recreational fishing;

d) set the allowance for other sources of fishing-related mortality at 26 tonnes; increase the TACC from 441 tonnes to 529 tonnes;

e) require Challenger FMC to maintain an existing voluntary code of practice to reduce the risk of Maui's dolphin or seabird bycatch;

f) require Challenger FMC to implement a logbook programme and biological sampling (length, sex) in the SCH set net fisheries, with at least 30% of both set net and line fishing events being monitored;

g) require Challenger FMC to implement a 'Multi Species Log Book' programme in the set net, line, and trawl fisheries that accommodates the reporting of sightings of Maui's dolphins and any capture of seabirds in the SCH 8 fishery;

h) require Challenger FMC to analyse standardised CPUE on the MFish commercial fisheries catch & effort database for shark set net and line fisheries taking school shark in SCH 8;

i) require Challenger FMC to provide annual updates to MFish on the compliance with keeping of logbooks, collection of biological information, and monitoring of fishing-related mortality;

j) require Challenger FMC to provide full reports to the AMP Working Group and Plenary, in 2007 and 2010, on standardised CPUE analysis for the SCH 8 fishery, biological information, and monitoring of fishing-related mortality; and;

k) require Challenger FMC to continue to implement measures to mitigate potential impacts of fishing on Maui's dolphins and seabirds. In particular, require Challenger FMC to implement an appropriate independent monitoring programme as soon as possible.

ANNEX ONE

Statutory Considerations

TAC

55 The purpose of the Act, set out in s 8, is to provide for utilisation of fisheries resources while ensuring sustainability. Utilisation, as defined in the Act, includes developing fisheries. The adaptive management proposal for SCH 8 is intended to provide a structured and monitored way to explore the development opportunities of the fishery, while ensuring sustainability. The increased TACC, and setting of allowances, will provide for development of the fishery and create the potential for people to better provide for their social, cultural, and economic well-being.

56 The TAC should be set, under s 13, to move the stock towards or above the level that can produce MSY. The Plenary agreed that school shark is one biological stock within New Zealand and that although the stock sizes in all four school shark stocks (SCH 3, 5, 7, and 8) may be uncertain there is reasonable probability that these stocks have increased to a level at, near, or above B_{msy}. The Plenary's conclusion was based on the large decrease in catches upon introduction of this stock to the QMS in 1986 and stable, or possibly increasing, CPUE indices under recent catch levels above the TACC. The Plenary also concluded that annual monitoring and review under the AMP would mitigate the risks to sustainability under the proposed increased catch levels.

57 A range of species is likely to be caught in the trawl fishery that takes school shark as a bycatch in SCH 8. The most significant commercial species taken in the SCH 8 fishery are gurnard, trevally, and tarakihi, 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 SCH 8 at this time (s 13(2)(b)(1)).

58 There should be economic benefits that extend from the cost-effective gathering of information from the fishery. This information could result in improved assessment of the SCH 8 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

59 Increasing the SCH 8 TAC, as proposed, will have economic benefits in the short term, but longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

60 School shark are taken as a bycatch in other target trawl and set net fisheries. A higher TACC for SCH 8 might make it easier for fishers to obtain the ACE to cover their bycatch of school shark.

61 MFish notes that this developmental opportunity provides potential for greater economic benefits without creating any anticipated social, economic or cultural issues for other sectors (s 13 (3)).

62 SCH 7 does not appear to be prone to significant fluctuations in biomass from year to year. MFish is of the view that there is no natural variability to take into account when setting or varying the TAC/TACC or other allowances (s 11(1)(c)).

Effects of fishing/environmental considerations

63 The adverse effects on the aquatic environment of the management measures must be taken into account when considering the proposed TAC and TACC.

64 The Plenary noted that most of the SCH 8 catch is taken by the target set net and line fishery, and as a bycatch of trawl fisheries for other species.

65 Under the provisions of the Marine Mammals Act 1978, Maui's dolphin is a threatened species and is listed as critically endangered by IUCN. There is uncertainty in the available information on the present size of the population and uncertainty about "safe" levels of fishing-related mortality. However, it is evident that the numbers are very low, and that fishing-related mortality must be minimised to help ensure the long-term viability of this threatened species. Given the low reproductive capacity of this species and the recent mortalities, it would be reasonable to assume that the resident population of Maui's dolphin on the west coast North Island has declined since the only published estimate of population size (134) was determined in 1985.

66 The SCH 8 set net fishery overlaps with the southern-most part of the known area of distribution of this small population of Maui's dolphin. The distribution of Maui's dolphin was thought to occur from Maunganui Bluff (north of Dargaville) to Pariokariwa Point (north of New Plymouth) on the west coast of the North Island, in Areas 041, 042, and 045, with the main part of the population residing in Area 042. In order to provide protection to Maui's dolphin, the Minister of Fisheries from 24 January 2003 banned set nets from the inshore waters out to 4 nautical miles from the coast (excluding most harbour areas) from Maunganui Bluff to Pariokariwa Point to provide protection to Maui's dolphin. However, recently sightings have been made of Maui's dolphin in the area off New Plymouth and the Sugar Loaf Islands, in Area 040, south of the 4 nautical miles set net ban.

67 MFish notes that only 13 tonnes (15%) of the proposed 88 tonne increase in the TACC (from 441 to 529 tonnes) has been taken on average in the three most recent fishing years. Therefore, the proposed TACC increase does represent a genuine increase in fishing effort and in catch. Set net fishers have taken 23% of their SCH 8 catch in Area 041 and 45% in Area 040 (over the 1989-90 to 2001-02 fishing years). Maui's dolphin will largely be afforded protection in Area 041 by the 4 nautical miles set net ban.

68 The degree of risk of a fishing-related mortality is related to the local abundance of Maui's dolphins and the frequency of fishing in that area. It is apparent that fishing in the area of the animals' core distribution would pose the greatest risk of a fishing-related mortality. It appears that Area 040 is on the outer margins of the distribution of Maui's dolphin, thus the chance of Maui's dolphins encountering fishing gear is low in Area 040, in spite of the high level of school shark fishing in that area.

69 Half of the school shark set net catch is taken as a bycatch of the main set net target fishery for rig[23], which occurs inshore of the target school shark fishery. Fishers fishing inshore, therefore, are likely to catch a greater proportion of rig, for which ACE is likely to run short[24] and they will have to pay deemed values, thus providing an incentive to fish offshore to better target school shark. The increased targeting of school shark under the AMP is, therefore, likely to be well seaward of the main distribution of Maui's dolphins, which are mainly found within 4 nautical miles of the coast.

70 MFish is of the view that the spatial separation of the target set net fishery for school shark in SCH 8, by being offshore and at the outer margin of the distribution of Maui's dolphin, should assist in reducing the risk of further entanglements of Maui's dolphins from increasing the SCH 8 TACC.

71 The Plenary considered interactions between Maui's dolphin and the SCH 8 fishery. The Plenary noted that Challenger FMC had introduced the voluntary use of pingers and a code of practice for commercial set netters in 2001-02[25]. The code of practice includes a range of measures to reduce the possibility of Maui's dolphin mortalities.

72 Challenger FMC propose to introduce a voluntary logbook scheme to provide high spatial resolution for SCH 8 catch and effort. MFish propose that the logbook also accommodate the reporting of sightings of Maui's dolphins and seabird capture in the SCH 8 fishery. MFish believes that the logbook scheme and the code of practice are fundamental to reducing the risk of Maui's dolphin or seabird bycatch in the SCH 8 fishery.

73 MFish also notes that 22% of the SCH 8 catch is taken in a bottom line fishery (mainly in Areas 039 and 041) where there may be increased risk of entangling seabirds. The SCH 8 fishery overlaps with the northern-most foraging distribution of the Westland petrel, which is listed by the IUCN as 'vulnerable'.

74 The SCH fishery does not dispose of any significant amount of fish waste or offal at sea. The AMP proposal also notes that offal is typically discarded in this fishery after nets have been retrieved, as there are insufficient people on these vessels to retrieve the net and process the fish simultaneously. Thus the potential for interactions with seabirds is reduced. The draft Seabird Interaction with Fisheries in the New Zealand Exclusive Zone - A Review and National Plan of Action 2000 does not list school shark as one of the fisheries that are of concern with seabird interactions.

75 Challenger FMC reports that there appears to be little interaction between the SCH 8 school shark line fishery and seabirds. MFish notes that the voluntary code of practice in SCH 8 requires the reporting of any dolphin captures, and MFish considers that this should be expanded to include any seabird captures.

76 The Plenary considered that it was unlikely that an increased SCH 8 TACC would result in any new areas being fished. In addition, the Plenary noted that video

[23] 48% of the set net school shark catch was taken by fishers targeting rig

[24] As a result of the increase in the TACC for school shark, with no change to the TACC for rig

[25] Further information on the impacts of fishing are to be found in the *SCH 8 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 13 November 2003, produced by the Challenger Finfish Management Company Limited. This document can be accessed on the Ministry of Fisheries website, as detailed in the Annex 2.

monitoring of the small vessel fishing fleet in QMA 3 is being trialed as a potential monitoring methodology for fishing-related mortalities.

77 These factors, taken together, suggest that the proposed increase in the TACC does increase the risk of mortalities of marine mammals and seabirds. The extent of this increased risk is unknown. Given that the target SCH 8 set netting is offshore and offal is not disposed of during net retrieval, it is probable that the increased risk is low. Reporting of bycatch and protected species will allow for information to be collected to advance our knowledge of the impacts.

78 However, MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the SCH 8 fishery. Challenger FMC is strongly encouraged to take account of the video monitoring trials in QMA 3 and, depending on results, implement an appropriate monitoring programme as soon as possible. The SCH 8 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

79 The Act requires a decision maker to consider the principles that biological diversity of the aquatic environment should be maintained and that habitats of particular significance to fisheries management should be protected (s 9).

80 MFish notes that a number of habitats of particular significance to fisheries management are closed by regulation including some of the close inshore bay and harbour areas in Wellington and Taranaki that will protect some inshore breeding and nursery areas of small sharks.

Other statutory considerations

81 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers that all issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for SCH 8 (s 5(a) & (b)).

82 Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls under the 1996 Act for SCH 8 include the following:

- A minimum net mesh size of 150 mm for both commercial and recreational fishers[26];
- School shark is one of the species that is included within a combined daily bag limit of 20 finfish for recreational fishing in SCH 8[27];
- There are a number of controls on fishing gear used by amateurs to catch SCH 8, including only being able to use one small set net (less than 60m) and longlines must have less than 25 hooks;
- Set netting is prohibited for both commercial and recreational fishers within 4 nautical miles of the coast from Pariokariwa Point to Tirua Point[28] (and continues on to Maunganui Bluff in SCH 9);

[26] Regulation 3A, Fisheries (Central Area Commercial Fishing) Regulations 1986; Regulation 3B, Fisheries (Central Area Amateur Fishing) Regulations 1986
[27] Regulation 3A, Fisheries (Central Area Amateur Fishing) Regulations 1986

- Restrictions on fishing around the Sugar Loaf Islands include:
    - Recreational fishers are not permitted to set nets or set lines, fishing lines may have a maximum of 3 hooks, only kingfish and kahawai can be taken, kingfish and kahawai can only be taken by trolling and spearfishing[29]; and
    - Commercial fishers can take a maximum of 100 kingfish and kahawai (combined) by trolling on any one day[30];
- Commercial fishing is prohibited in Porirua harbour, apart from potting for crabs[31];
- Set netting is prohibited for recreational fishers within Pauatahanui Inlet, part of Porirua Harbour[32];
- Trawling is prohibited in Porirua Harbour[33];
- Trawling is prohibited in Urenui Bay from Airdale Reef to Tongaporutu River[34];
- Trawling by vessels over 46 metres length is prohibited within specified areas in the Territorial Waters[35];
- Danish seining is prohibited within 3 nautical miles of the coast throughout SCH 8[36];
- Commercial set nets, if set in depths less than 30 metres, must be less than 500 metres in length and no part of the net is to be within 2 metres of the surface[37]; and
- Commercial fishers must service their nets within 24 hours[38].

83 All fishing is prohibited in the Kapiti Island Marine Reserve.

84 The commercial fishing industry also has voluntarily agreed to refrain from trawling close inshore along the following coastlines:

[28] Regulation 7D, Fisheries (Central Area Commercial Fishing) Regulations 1986; Regulation 5C, Fisheries (Central Area Amateur Fishing) Regulations 1986
[29] Regulation 5, Fisheries (Central Area Amateur Fishing) Regulations 1986
[30] Regulation 14, Fisheries (Central Area Commercial Fishing) Regulations 1986
[31] Regulation 9A, Fisheries (Central Area Commercial Fishing) Regulations 1986
[32] Regulation 4A, Fisheries (Central Area Amateur Fishing) Regulations 1986
[33] Regulation 6(b), Fisheries (Central Area Commercial Fishing) Regulations 1986
[34] Regulation 6(c), Fisheries (Central Area Commercial Fishing) Regulations 1986
[35] Regulation 6A, Fisheries (Central Area Commercial Fishing) Regulations 1986
[36] Regulation 7, Fisheries (Central Area Commercial Fishing) Regulations 1986
[37] Regulation 7A, Fisheries (Central Area Commercial Fishing) Regulations 1986
[38] Regulation 7B, Fisheries (Central Area Commercial Fishing) Regulations 1986

North Taranaki Bight

- No single or pair trawling inside 1 nm from the coast between Tirua Point and Awakino River
- No single or pair trawling inside 2 nm from the coast between Awakino River and Port Taranaki

South Taranaki Bight

- No single trawling inside 2 nm from the coast between Cape Egmont and Rangitikei River
- No pair trawling inside 4 nm from the coast between Cape Egmont and Rangitikei River

Kapiti - Wellington

- No single or pair trawling inside 1 nm from the coast between Rangitikei River to Peka Peka
- No single or pair trawling inside 1 nm around most of the coast of Kapiti Island
- No single or pair trawling inside 1 nm from Wairaka Point to Titahi Bay including Mana Island
- No pair trawling inside 4 nm from the coast between Rangitikei River and Titahi Bay, including the coast of Kapiti Island and Mana Island

85 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, and any relevant fisheries plan approved under Part III of the Act. MFish does not consider that existing or proposed services materially affect this proposal for SCH 8. There is no decision to not require a service in this fishery.

86 A fishery plan could provide another mechanism through which to explore the potential of the SCH 8 fishery, however, a fishery plan has not been developed or approved to date (s 11(2A)(a), (b), & (c)).

87 Before setting or varying any sustainability measure for SCH 8, the Minister must take into5 account any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987.

88 Within SCH 8, there are two Department of Conservation conservancies (Wanganui, and Wellington) that have produced conservation management strategies under the Conservation Act 1987. These strategies identify a number of issues. The ones of significance to the SCH 8 fishery are advocating for the sustainable use of marine fisheries and promoting the protection of significant marine ecosystems from the adverse effects of fishing practices.

89 The proposed TACC increase under this AMP, and the subsequent monitoring, is designed to ensure that sustainable use of this resource is achieved, while carefully

monitoring for any additional impacts on marine ecosystems or marine mammals. In the absence of a completed population management plan the use of pingers, and the voluntary code of practice have been adopted by industry to reduce the possibility of dolphin mortalities associated with the commercial fishery (s 11(2)(a)). 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 that are relevant to setting the proposed TACC increase under this SCH 8 AMP (s 11(2)(b)).

90 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. No taiapure or mätaitai reserves exist in the QMA. No restrictions have been placed on fishing in any area within the QMA for recreational interests using the provisions in s 311 (s 21(1)(a) & (b), 4(i) & (ii), (5)).

91 The information principles of the Act require that decisions be based on the best available information, take into account any uncertainty of this information, and apply 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.

92 MFish considers that the information used to support the SCH 8 proposal is the best available. The stock information has been reviewed by the AMP Working Group and by Plenary. While it is recognised that the current status of the stock is uncertain, the monitoring criteria for the proposal will allow for improved information to be obtained, and for caution to be applied when using new information(s 10). There is little information on marine mammal and seabird interactions with the SCH 8 fishery, particularly in Area 040, and that information is uncertain. MFish does not believe that the uncertainty about the stock status is a reason to prevent the Minister from approving this AMP.

ANNEX TWO

Biological Characteristics

93 School sharks are distributed across the shelf, generally being inshore in summer and offshore in winter. They extend in smaller numbers near the seafloor, down the upper continental shelf, to at least 600 m depth. Capture of school sharks by tuna longliners shows their distribution extends well offshore, up to 180 nm off the South Island, and 400 nm off northern New Zealand towards the Kermadec Islands.

94 Breeding is not annual; it has generally been assumed to be biennial, but recent work on a Brazilian stock suggests that females have a 3-year cycle. Fecundity (pup numbers) increases from 5-10 in small females to over 40 in the largest. Mating is believed to occur in deep water, probably in winter. Release of pups occurs during spring and early summer (November-January), apparently earlier in the north of the country than in the south. Nursery grounds include harbours, shallow bays, and sheltered coasts. The pups remain in the shallow nursery grounds during their first one or two years and subsequently disperse across the shelf. The geographic location of the most important pupping and nursery grounds in New Zealand is not known.

95 Growth rates have not been estimated for New Zealand fish, but in Australia and South America school sharks are slow-growing and long-lived. They are difficult to age by conventional methods, but up to 45 vertebral rings can be counted. Growth is fastest for the first few years, slows appreciably between 5 and 15 years, and is negligible after 20 years.

96 Sexual maturity is estimated to occur at 12-17 years for males and 13-15 years for females. The size range of commercially caught maturing and adult school shark is 90-170 total length (TL), with a broad mode at 110-130 cm TL, which varies with area, season, and depth.

97 The combination of late maturity, slow growth, and low fecundity gives low overall productivity. In Australia, natural mortality (M) has been estimated at 0.10. Results from an Australian long-term tag recovery suggest a maximum age of at least 50 years.

98 New Zealand tagging studies have shown that school shark may move considerable distances, including trans-Tasman Ocean migrations. But the majority of recaptures are in the same QMA. These tagging studies suggest that there is a single biological stock.

Catch Information

Commercial fisheries

99 The total commercial catch of school shark throughout the 1970s averaged about 550 tonnes due to modest demand for fillets by the Australian market. Development of the New Zealand and Australian markets, and the use of more efficient set nets, resulted in the catch rising rapidly to a national peak of over 4 000 tonnes in 1983. However, commercial catches declined over the next two fishing years. To address

declining catch rates and low productivity concerns, school shark was introduced into the QMS in 1986.

100 The TACC for school shark in SCH 8 was set at 310 tonnes when this fishstock was first introduced into the QMS but rose rapidly to the current level of 441 tonnes, as a result of quota appeals.

101 Commercial catches have been above the TACC since the 1992-93 fishing year (except for 1994-95). Catches have averaged 454 tonnes or 3% over the TACC for the three most recent fishing years to 2002-03, and they have averaged 473 tonnes or 7% over the TACC for the five recent years.

102 Set netting accounts for two-thirds of the total landings of SCH 8, with bottom longline (22%) and bottom trawl (11%) accounting for the balance of the landings. The set net fisheries are almost exclusively targeting school shark (43% of the set net school shark catch was taken by fishers targeting school shark) and rig (48% of the set net school shark catch was taken by fishers targeting rig). There is a small bycatch of school shark in a target warehou set net fishery. The bottom longline fishery is mainly targeting school shark (88% of the school shark longline catch was taken by fishers targeting school shark). School shark are taken as a bycatch of the major west coast North Island trawl fisheries, targeting particularly gurnard, trevally, tarakihi, and snapper.

Table 2: Reported landings (tonnes) and TACCs (tonnes) of school shark from SCH 8 from 1986–87 to 2001-02

Year	Landings (tonnes)	TACC (tonnes)
1986–87	224	310
1987–88	374	345
1988–89	419	433
1989–90	371	438
1990–91	369	441
1991–92	401	441
1992–93	482	441
1993–94	448	441
1994–95	417	441
1995–96	521	441
1996–97	458	441
1997–98	443	441
1998–99	533	441
1999–00	469	441
2000–01	453	441
2001-02	448	441
2002-03	460	441

103 The most important areas for taking school shark vary by method; set netting is important in Areas 040 (Cape Egmont coastline) where 45% of the set net catch of SCH 8 was taken. The other important set net areas were Area 041 (north Taranaki) with 23% of the catch, and Area 039 (Manawatu-Wanganui coastline) with 22% of the catch.

104 Bottom longline was important in Areas 039 and 041 (with each area having about 35% of the longline catch of school shark), and Area 040 (27%). The main trawl bycatch of school shark was taken in Areas 041 (32% of the trawl catch of school shark), Area 039 (31%), and Area 040 (26%).

105 Further commercial catch information can be found in the *SCH 8 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 13 November 2003, produced by the Challenger Finfish Management Company Limited. This document can be viewed on the Ministry of Fisheries website at <<http://www.fish.govt.nz/sustainability/research/assessment/index.html>>. You will be asked for a username and a password. The username is: workinggroup; the password is: bluenose. Under '2003 Working Group Documents' the required document is listed as 'SCH 8 AMP Proposal'.

Customary Mäori fisheries

106 Mäori fishers made extensive use of school shark (makohuarau) in pre-European times for food, oil, and skin.

107 School shark is a traditional customary fisheries resource as it is readily caught by traditional fishing methods in the inshore zone, and highly prized as a food source. No estimate is available for customary catch of SCH 8.

Recreational fisheries

108 Recreational fishing surveys have been undertaken in 1992-93, 1996, 1999-00, and 2000-01 to provide recreational harvest estimates. The Recreational Fisheries Working Group meeting in October 2003 was satisfied with the general methodology of the 1999-00 survey, and that the results from the 1999-00 survey, and the 2000-01 follow-up survey, were acceptable. It was noted that caution needs to be exercised with the interpretation of some figures, particularly for QMA 2 fishstocks, and where the coefficient-of-variation is high. The Working Group meeting concluded that the1999-00 survey and the 2000-01 follow-up survey generally should be used in preference to the earlier surveys.

Table 3: Estimated harvest of school shark in SCH 8 by recreational fishers from recreational fishing diary surveys (NA = not available)

Survey	Fishstock	Point estimate (tonnes)	Range (tonnes)
1992-93	SCH 8		10 - 30
1996	SCH 8	21	15 - 25
1999-00	SCH 8	8	4 - 12
2000-01	SCH 8	NA	NA

109 The 1992-93 survey had an estimate occurring between 10 and 20 tonnes, while the 1996 estimate was 21 tonnes, with a range of 15-25 tonnes. The estimate for 1999-00 survey was 8 tonnes, with a range of 4 - 12 tonnes (Table 3). No estimate for SCH 7 is currently available from the 2000-01 survey.

110 The estimates for SCH 8 in the 1992-93 and 1996 surveys were similar to each other, and higher than the 1999-00 estimate. The Recreational Fisheries Working Group considered that the 1996 survey generally under-estimated the recreational harvest compared to the 1999-00 survey. It appears likely that the 1996 estimate of 21 tonnes, while it may be an under-estimate, is the best available estimate of recreational harvest in SCH 8.

111 Based on the above recreational fishing surveys, boat fishers mainly catch school shark using set nets and handlines.

Other sources of fishing-related mortality

112 No quantitative information is available on the level of illegal catch. There is an unknown amount of unreported offshore trawl and pelagic longline catch of school shark, either landed (under another name, or in "mixed") or discarded.

113 There is an unknown discarded bycatch of juvenile, mainly first-year, school shark taken in harbour and bay set nets, but this is not likely to be a significant issue in SCH 8 where there are few sheltered bays and harbours. Moreover, there are some significant inshore areas that are closed to set netting. Most of the SCH 8 catch is taken by the target set net and bottom longline fisheries and as a bycatch of trawl fisheries for other species. There will have an element of mortality associated with school shark that might escape through set and trawl nets, but be fatally injured. Quantitative information is not available on these sources of mortality.

Social, cultural and economic factors

114 School shark is a valued kaimoana species for tangata whenua on the lower west coast of the North Island. No quantitative information is available on the level of customary Mäori catch.

115 School shark is not a significant target species for recreational fishers in SCH 8.

116 SCH 8 quota was being traded at $14 185.20 per tonne (as at 30 September 2003), with ACE traded at $1 290.30 per tonne. There were 45 quota owners in the fishery, and 70 ACE holders, with ACE holdings ranging from 21 holders with less than 0.5 tonnes each to three holders with 50-100 tonnes.

Stock Assessment Information

117 The AMP Plenary, in December 2003, evaluated the stock assessment criteria, decision-rules, and monitoring programme of the Challenger FMC SCH 8 AMP proposal (dated 13 November 2003) as part of the review required for proposed AMP fishstocks. The Plenary report for SCH 8 follows:

118 The Plenary reviewed a proposal from the Challenger Finfish Management Company to increase the TACC for SCH 8 by 20% from 441 tonnes to 529 tonnes. In this stock catches are mainly taken in the target set net fishery with smaller volumes as trawl bycatch and line target fisheries. The CPUE indices for set net on all shark species in QMA three were evaluated. CPUE fluctuated throughout the period with an increase in the last two years.

SCH 8 monitoring

119 The analysis of CPUE data from the target shark set net fisheries recorded in MFish catch and effort logs will be used to monitor this Fishstock. A sampling programme using voluntary logbooks will be added to the current programme in the inshore QMA 8 set net fishery. In addition, the target line fishery in QMA 8 will be asked to provide biological information on this species.

Effects of fishing

120 The majority of the catch is taken by the target set net fishery. The population of Maui's dolphin on the west coast of the North Island is estimated to be approximately 100 and is listed as critically endangered by the IUCN. However only a very small section of SCH8 overlaps with the southern most distribution of the Maui dolphin population distribution. In addition to the measures included in the voluntary code of practice for set net fishers, a set net ban within four miles of the coast from New Plymouth to Dargaville should provide adequate protection for Maui dolphins in the future.

Review of new AMP proposals for SCH fishstocks

121 The AMP Plenary in December 2003 agreed with the following regarding the fit to the AMP stock assessment criteria for all school shark fishstocks:

Stock assessment criteria

122 The stock size may be uncertain, but based on:

a) a large decrease in catches upon introduction of this species to the QMS in 1986; and

b) stable or possibly increasing CPUE indices under recent catch levels above the TACC; there is a reasonable probability that these fishstocks have increased to levels at, near or above B_{MSY}.

Monitoring criteria

123 The existing monitoring programme in SCH 3 and 5 from set net logbooks may be satisfactory to monitor the size frequency of the catch, provided adequate level of coverage is maintained. In SCH 7 and 8, the existing logbook programme needs to be expanded to cover school shark.

Decision-rule criteria

124 A decision-rule to review all information in 2007 after two years operation of the AMP was agreed.

Environmental considerations

125 Maui's dolphin populations are found throughout all the school shark fisheries proposed for the AMP increase. The use of pingers in some areas and adherence to voluntary codes of practice are designed to reduce the possibility of mortalities associated with the commercial set net fishery. Video monitoring of the small vessel fishing fleet in QMAs 3 and 5 is being trialed as a potential monitoring methodology. There are not considered to be any likely increased impacts of fishing from the trawl fishery in these stocks.

Future review

126 The AMPs will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two years and at the end of the five years of the programme.

Conclusions

127 The AMP Plenary agreed that all four school shark stocks could be considered for inclusion in the AMP. The stable or increasing CPUE in the target set net fisheries in SCH 3, 5, 7, and 8 may indicate increased abundance of school shark in these areas. The combined TACC for these stocks has been exceeded in three of the last four years, whereas the TACCs were always under caught in the early 1990s.

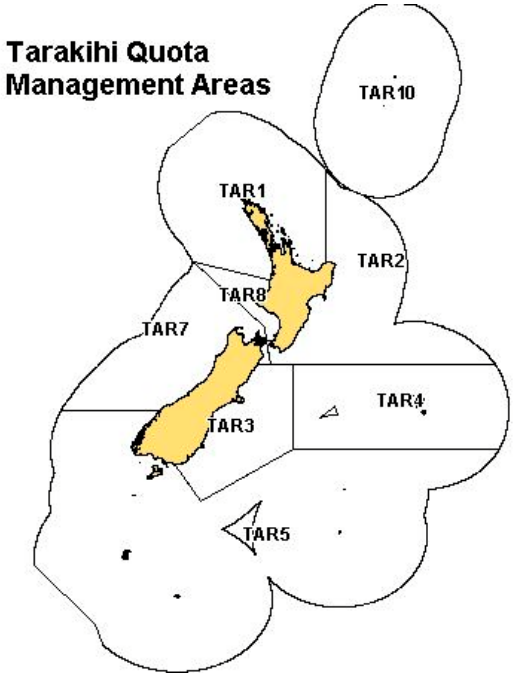
Research plan

128 There are a number of recent research projects that relate to the SCH 8 fishery. These are:

- Carry out a stock assessment of school shark 1. Estimate biomass and sustainable yields *(SCH1999/01)*;
- Determine areas of habitat of importance to fisheries management within the NZ EEZ;
- Determine areas of important juvenile fish habitat;
- Determine areas of importance for shark populations for pupping or egg laying *(ENV1999/03)*;
- Investigation of areas of habitat of particular significance for fisheries management within the New Zealand EEZ. 1. To map bryozoan-dominated epibenthic assemblages in Golden and Tasman Bay and the outer Marlborough Sounds. 2. To review the role and influence of frame-building bryozoans and associated seabed structure on epibenthic biodiversity and the life history of commercially valuable species and make research recommendations on how to formally assess this role *(ENV2001/13)*; and
- Estimating relative abundance of school shark *(HPB2002/01)*.

TARAKIHI 2 (TAR 2) AMP PROPOSAL – INITIAL POSITION PAPER

Figure 1. **Map showing the boundaries of Tarakihi quota management areas, including TAR 2.**



Key Issues to be Considered

1 The key issues to be considered for the TAR 2 Adaptive Management Programme (AMP) proposal are:

a) The Area 2 Inshore Finfish Management Company Ltd (**Area 2**) propose that the Total Allowable Commercial Catch (TACC) for TAR 2 is increased by 10% for a five-year period under an AMP;

b) TAR 2 is a bottom trawl target fishery with a long stable catch history and recent TAR 2 catches have exceeded the TACC. Standardised trawl catch per unit effort (CPUE) is regarded to be a reasonable index of abundance for TAR 2 and has increased steadily since 1995–96;

c) Area 2 has proposed a programme to monitor the status of the fishery under the AMP;

d) The 2003 AMP Plenary agreed that the proposal satisfied the fishery assessment requirements of the AMP;

e) TAR 2 is an important shared fishery and has fishery interactions with a number of other inshore fisheries;

f) The increase in effort and environmental effects associated with a 10% TACC increase is likely to be small; and

g) TAR 2 does not meet the criteria for consideration under the Low Knowledge Bycatch Framework.

Management Proposal

2 The proposed management programme, TAC, TACC, and allowances for TAR 2 are presented in Table 1.

Table 1 Proposed management framework, TAC, TACC and allowances (tonnes) for TAR 2

Programme	TAC	Customary allowance	Recreational allowance	Other sources of mortality	TACC
Adaptive Management Programme	2 082	100	150	36	1 796

3 **Area 2** propose to establish a new five-year AMP for TAR 2 that will:

a) Increase the TACC from 1 633 tonnes to 1 796 tonnes;

b) Implement a logbook reporting programme and commercial catch sampling programme to:

i) Monitor the status of the TAR 2 stock and associated fisheries, particularly SNA 2;

ii) Monitor the response of fishers (in terms of catch and effort) to the TACC increase; and

iii) Provide an assessment of the impacts of marginal change in the fishery on the environment and a process by which these effects can be monitored and mitigated.

4 The proposed research programme will use data collected from a vessel logbook programme and a commercial catch sampling programme. Regular updates of key performance indicators of stock status will be reported to the relevant fishery assessment working group.

5 MFish recommends the proposal should include the following measures:

a) Setting the Total Allowable Catch (TAC) at 2 082 tonnes;

b) Making allowances of 100 tonnes for customary Mäori catch and 150 tonnes for recreational catch;

c) Making an allowance of 36 tonnes for unreported catch and other sources of fishing related mortality; and

a) Increasing the TACC from 1 633 tonnes to 1 796 tonnes.

AMP TAC and Allowances

TAC

6 No TAC has been set for TAR 2 and there are no specific allowances for non-commercial fishers. For the purposes of varying a TACC for a quota management stock, the Fisheries Act 1996 (the Act) requires a TAC be set under s 13 or s 14, and that within the TAC, allowances are made for non-commercial fishing interests in that stock.

7 MFish proposes to set a TAC for TAR 2 under s 13 of the Act because the biological characteristics of tarakihi allow the maximum sustainable yield (MSY) to be

estimated, the fishery is not part of any international agreement, and is not managed on a rotational or enhanced basis. Section 13 requires that the stock is maintained at, or moved towards, a level that can produce the MSY. Tarakihi does not meet the criteria for consideration under the alternative options for setting sustainability measures provided by s 14.

8 No quantitative assessment of the status of the TAR 2 stock relative to the stock level that would produce the maximum sustainable yield (MSY) is available. However, commercial catches in TAR 2 have been relatively stable at or above the TACC since the 1990–91 fishing year and a recent analysis of commercial CPUE data for TAR 2 suggests that stock abundance appears to be increasing under current catch levels. Refer to Annex 1 for additional biological and catch history information.

Policy frameworks

9 MFish considered setting the TAC and increasing the TACC for TAR 2 under the AMP and the low knowledge bycatch frameworks. MFish prefers the AMP option because TAR 2 does not satisfy the criteria for a TACC adjustment under the low knowledge bycatch framework. Specifically:

a) Standardised CPUE indices provide a reasonable index of relative abundance;

b) Approximately 80% of the catch taken by the bottom trawl fishery (99% of total catch) is targeted and the additional monitoring proposed under the AMP would be beneficial to improving knowledge about the stock; and

c) Overcatch of the TACC has been relatively small over the last three years (1.5%, 6% and 6% respectively).

10 In addition, TAR 2 is an important shared fishery. While MFish does not consider there are likely to be any significant sustainability concerns arising from this proposal, the additional monitoring proposed under the AMP provides added surety that any changes to stock abundance will be highlighted in a timely fashion.

Rationale for proposed TAC

11 Based on the fact that commercial catches have been relatively stable at or above the TACC over the past 13 years, and commercial CPUE has also been stable, the 2003 AMP Plenary was satisfied that TAR 2 met the criteria for inclusion in the AMP because:

a) there is reasonable probability that current biomass is greater than the level that would produce the maximum sustainable yield (MSY);

b) the proposed TACC increase is likely to allow the stock to move towards the level that would produce the MSY; and

c) stock abundance appears to be increasing under current catch levels[39].

12 Given the Plenary's views, MFish considers that the proposed TAC (incorporating the increased TACC) poses a relatively low sustainability risk while providing for increased utilisation of the TAR 2 stock.

[39] The full conclusions from the 2003 AMP Plenary are available in Annex 2

13 However, TAR 2 is an important shared fishery between commercial and non-commercial fishers. In addition, commercial fishers catch a number of other species including snapper, gurnard, barracouta, hoki, blue moki and trevally when targeting tarakihi in QMA 2. The 2003 AMP Plenary considered that additional monitoring measures would be necessary to allow an evaluation of the impact of the proposed TACC increase on associated fisheries, particularly SNA 2, and also to provide means to detect changes in the age/size structure of the TAR 2 stock.

14 **Area 2** has proposed a research programme that will aid future management of the stock by continually updating the index of relative abundance (CPUE) and providing updated information on other aspects of stock status. Specifically, the research programme will include:

a) A logbook programme to collect data on the location, composition (target and bycatch) and methods used during fishing activities. Data on bycatch stocks will also be available from this logbook programme; and

b) A commercial catch sampling programme to collect biological and demographic information from the catch. There is the opportunity for this sampling to be carried out in conjunction with the commercial shed sampling already undertaken in FMA 2 for other stocks.

15 Collected information will culminate in an annual or bi-annual descriptive analysis of the fishery including an analysis of catch and effort, an analysis of the catch information from the shed sampling (length-age/frequency trends, sex), an investigation of the response of the SNA 2 fishery to the TAR 2 increase, and an analysis of the impacts of the TACC increase (within the proposed TAC) on the environment.

16 There are clear benefits associated with managing a TACC increase within the AMP. TAR 2 is a valuable shared fishery and MFish considers that the monitoring proposed under the AMP may mitigate risks (sustainability and impacts on associated fisheries) at the proposed TAC level while allowing for better utilisation.

17 No decision rules are proposed for the stock under the AMP. Rather, full analysis of all information every two to three years is a more effective way to review the performance of the TAR 2 stock under the AMP. If successful, this AMP will undergo a full review in March 2007 by the relevant fishery assessment working group (FAWG) and then again in 2010 at the completion of the AMP.

18 The proposed programme will managed by **Area 2**, but the research will be sub-contracted to independent research providers. **Area 2** anticipates that participation in the programme will be high due to the high membership of TAR 2 fishers in the company.

19 MFish proposes the following additional requirements for monitoring of the AMP, by **Area 2**:

a) formally demonstrating a commitment by a sufficient number of ACE holders to participate in the logbook and monitoring components of the AMP before 1 October 2004; and

b) providing annual updates to MFish on the compliance with keeping of logbooks and collection of biological information.

20 Other factors that the Minister must consider before setting any sustainability measure (which includes a TAC) are discussed under the Statutory Considerations section in Annex 3.

Adverse effects on the aquatic environment

21 The bottom trawl TAR 2 fishery generally occurs on soft-sediment substrate. The damage to the more sensitive hard substrate is likely to be minimal in this fishery. In addition, it is theoretically possible, through spatial adjustments in effort, to achieve a 10% increase in TAR 2 catch (as is being proposed by **Area 2**) without an overall increase in trawl effort in TAR 2. In other words, increases in trawl effort are expected to be lower than 10% and environmental effects associated with this are expected to be small.

22 Set nets account for less than 1% of the commercial tarakihi catch in TAR 2. In addition, the set net fishery is mostly a non-target fishery. The distribution of catch between trawl and set nets has remained stable over the last 13 fishing years and MFish does not consider that there will be a significant increase in set netting if the TACC is increased by 10% under the TAC proposed by MFish. There are no Hectors dolphin bycatch issues for the small set net fishery. There is no information to suggest that interactions between the TAR 2 fishery and marine mammals are of significant magnitude to affect the management proposal in this consultation document.

Impacts on interests of one or more fishing sectors

23 It is unlikely that a 10% TACC increase will affect the size and availability of tarakihi for non-commercial fishers. The spatial distribution of commercial catches in TAR 2 has remained stable for some time, and it is likely that increased catch will be spread over existing fished areas. If there is any change in the spatial distribution of catches, this is expected to be small. In addition, the monitoring proposed under the AMP should mitigate risks to the fishery under the proposed TAC.

24 There are some existing controls on trawling and set netting in parts of Hawke Bay, Mahia Peninsula, Portland Island and Cape Runaway. There is also a voluntary no trawl agreement for depths shallower than 12 m in Hawke Bay. It is unknown to what extent these controls spatially separate important recreational tarakihi fishing areas from commercially fished areas.

Recreational and customary

25 The 1999-2000 National Marine Recreational Fishing Survey estimates an annual recreational harvest of between 139 tonnes and 243 tonnes from TAR 2. However, there are concerns about recreational catch estimates from this survey in QMA 2 in general and they need to be treated with caution. Some of the QMA 2 estimates are considered to be unrealistically high. MFish proposes to balance the 1999-2000 estimate with an estimate from the earlier 1996 survey that was considered too low. The 1996 survey estimated that recreational fishers take between 55 tonnes and 75 tonnes of tarakihi from TAR 2. MFish proposes a balanced recreational allocation of 150 tonnes.

26 While considering the allowance for recreational interests, the Minister is required to take into account any regulations that prohibit or restrict fishing in any area for which

regulations have been made following a recommendation made by the Minister pursuant to s 311 of the Act (s 21(5) of the Act). No such regulations have been made.

27 Tarakihi are known to be of importance to customary fishers on the North Island east coast. No quantitative information on the level of customary Mäori catch of tarakihi in TAR 2 is available. The MFish guidelines outlined in the introductory section to this consultation document indicate that the customary allowance could equal the recreational allowance if the species is known to be of particular importance to Mäori.

28 MFish does not consider that setting a customary allowance that equals the proposed recreational allowance reflects what is actually happening in the fishery. It is likely that the customary harvest is smaller. MFish proposes that the customary allowance is based on two-thirds of the proposed recreational allowance, and set at 100 tonnes. MFish notes the customary allowance is not intended to limit the extent of customary catch, but rather to provide for the likely level of that catch.

29 MFish notes that a number of Tangata Kaitiaki/Tiaki have been appointed under the Fisheries (Kaimoana Customary Fishing) Regulations 1998 for parts of TAR 2. It is anticipated that the permit reporting process provided for under these regulations will provide better information on the level of customary participation in the fishery.

30 In considering the proposed allowance for customary non-commercial interests, the Minister is required to take into account any mätaitai reserve or section 186A closure of fishing area or restriction on fishing methods in the relevant QMA (s 21(4) of the Act). A small area at the northern end of Hicks Bay is subject to a section 186A temporary closure and method restriction that will expire in February 2005. MFish considers this should not affect any customary non-commercial allowance because the ban covers the taking of shellfish, and not finfish. There is no mätaitai reserve within TAR 2.

31 MFish acknowledges that **Area 2** has requested feedback on its proposal from recreational and customary fishing representatives, but it has received none to date.

TACC

32 The proposed AMP seeks to increase the TACC by 10% to 1 796 tonnes. MFish does not consider there is a high level of risk to the stock or the environment associated with increasing the TACC by 10%. Catches have been above the TACC for the last four fishing years, therefore the increase catch in real terms will be less than 10% of current catch. In essence, the proposed TACC will cover overcatch of the current TACC and provide for slightly higher levels of utilisation.

33 In support of the TACC increase, **Area 2** argue that TAR 2 is suitable for inclusion into the AMP because total landings have remained at or slightly above the TACC over the last 12 fishing years and fishing effort has remained stable during this time. **Area 2** also argues that the inshore and upper slope fisheries in FMA 2 are one of the most diverse fisheries in New Zealand and it is particularly difficult for fishers to avoid bycatch of untargeted stocks. **Area 2** go on to argue that this is especially true for tarakihi and presents fishers with considerable difficulties balancing TAR 2 catch against annual catch entitlement (ACE). Because the TACC is usually overcaught, there is the potential for dumping of the overcatch to avoid payment of deemed

values. **Area 2** argue that dumping is undesirable and that deemed value revenue would be better invested back into research in the fishery through an AMP.

34 There is evidence to support this argument because high deemed value bills have been charged in the past two fishing years. Approximately $250 000 has been charged to the industry in deemed values over each of the last two fishing years. MFish considers there is an opportunity under an AMP to invest what would otherwise be deemed value payments into fishery research to better assess stock status and appropriate harvest yields.

35 **Area 2** also argues the current TAR 2 TACC constrains the ability of fishers to catch the allocation of other stocks. Target fisheries that catch tarakihi as bycatch, including gurnard, barracouta, gemfish, hoki and blue warehou, have been undercaught over the past few years. However, it is not known if this is related to the current TAR 2 TACC and the requirement to pay deemed values or to other issues directly relevant to each fishery.

Other sources of mortality

36 No quantitative information is available on the level of illegal catch or other sources of mortality. Since the target fishery uses bottom trawl gear, there will be an element of mortality associated with tarakihi that might escape through the net. A minimum legal size applies to tarakihi (25cm) to commercial and recreational fishers, so some mortality is likely to be associated with the capture and release of undersized fish, particularly given the depth of the target fishery.

37 It is also possible that some tarakihi will be discarded by commercial fishers that do not hold sufficient ACE to avoid deemed value penalties. However, this source of mortality should theoretically decline if the TACC is increased because the current proposal is essentially geared to address this problem.

38 MFish proposes that, under the proposed TAC for the TAR 2 fishery, the allowance for other sources of mortality caused by fishing be set at approximately 2% of the TACC, or 36 tonnes.

Future Management

39 The AMP for TAR 2 is proposed to run for five years beginning 1 October 2004. **Area 2** will monitor the fishery each year and report back to the relevant fisheries assessment working group and AMP Plenary as required. At the end of the five-year period, the results of the proposal would be reviewed in detail. MFish is likely to be undertaking further surveys to determine the levels of recreational catch (including TAR 2) over the term of the AMP, and estimates of customary Mäori catch may also be available under the Fisheries (Kaimoana Customary Fishing) Regulations 1998.

40 Depending on the outcome of the AMP and revised estimates of non-commercial catches, MFish would propose the reconsideration of sustainability and utilisation measures for TAR 2. Such consideration could allow the different management objectives of the sectors to be taken into account when allocating access to the respective sectors under any revised estimate of sustainable yield. A key consideration at the completion of the AMP is whether the TACC should revert back to the current level.

Conclusion

41 MFish supports increasing the TACC for TAR 2 to 1 796 tonnes under a proposed AMP. The proposed TACC increase will primarily be used to balance catches at existing catch levels. MFish considers the increase in TACC poses a relatively low sustainability risk given the stability of TAR 2 landings over the past 13 years and the status of commercial CPUE.

42 MFish does not consider the proposed TACC increase will pose a significant risk to the aquatic environment, as the increase in the TACC should result in only small changes to effort and catch. The proposed TACC is also unlikely to affect the size and availability of tarakihi for non-commercial fishers. The spatial distribution of commercial catches has been stable over time, and any changes are expected to be minor. The relevant statutory considerations have been taken into account in determining the proposed management options for TAR 2 (refer to Annex 3).

43 The TAR 2 fishery does not meet the requirements for consideration under the low knowledge bycatch framework. MFish considers that additional monitoring is needed despite the view the proposed TAC is unlikely to adversely effect the aquatic environment, associated fisheries, and non-commercial fishers. TAR 2 is an important shared fishery between commercial and non-commercial interests, and interacts with a number of other important fisheries, particularly SNA 2.

44 The proposed AMP research programme should mitigate sustainability risks while allowing for better estimates of stock status and appropriate yields for TAR 2.

Preliminary Recommendations

45 MFish proposes to include the TAR 2 fishery under a five year AMP that will:

a) Set the TAC at 2 082 tonnes;

b) Make allowances of 100 tonnes for customary Mäori catch and 150 tonnes for recreational catch;

c) Make an allowance of 36 tonnes for unreported catch and incidental mortality; and

d) increase the TACC from 1633 tonnes to 1796 tonnes.

ANNEX ONE

Biological Characteristics

46 Tarakihi spawn during summer and autumn in several areas around New Zealand. The postlarval stages appear to be pelagic, with metamorphosis to juvenile stages occurring in spring and early summer at lengths of 7-9 cm (FL - fork length) at age of 7–12 months. Juvenile nursery grounds are found in shallow inshore areas, and juveniles move out to deeper water at about 25 cm FL and age three to four years.

47 Sexual maturity is reached at 25-35 cm FL and age four to six years, after which the growth rate slows. The best estimate of natural mortality (M) is 0.10. The maximum age exceeds 40 years, and there are generally 10 year classes in the fishery.

48 Tagging experiments indicate that some tarakihi move long distances. The long pelagic larval phase suggests that larvae will be widely dispersed. There is no evidence of any genetic isolation. These factors together suggest that tarakihi around the main islands of New Zealand consist of one continuous stock.

Catch Information

Commercial fishery

49 TAR 2 was introduced into the QMS in 1986 with a TACC of 1410 tonnes. Between 1986 and 1992 the TACC was increased and has remained at 1633 tonnes since the 1992–93 fishing year. Catches have exceeded the TACC in most fishing years since 1990–91 (Table 2).

50 Over the past 13 fishing years, approximately 99% of TAR 2 was taken by bottom trawl. The remainder was taken by other methods including set netting, Danish seining and mid-water trawling. This distribution of catches between these methods has remained relatively stable over the past 13 fishing years.

51 Approximately 80% of the annual TAR 2 commercial catch over the past 13 years has been targeted, with the remainder taken as a bycatch in the gurnard (5%), barracouta (4%) gemfish (4%), hoki (3%) and warehou (3%) fisheries. Most TAR 2 catch has come from statistical areas 013, 012, and 011 (Hawke's Bay – East Cape area). Fishing effort and the spatial distribution of trawl catch in TAR 2 has been relatively stable over the past 13 fishing years.

Table 2: TAR 2 landings (tonnes) and TACCs (tonnes) since the 1988-89 fishing year.

Fishing Year	TACC	Landings	Fishing Year	TACC	Landings
1983-84*	-	1118	1996-97†	1633	1639
1984-85*	-	1129	1997-98†	1633	1678
1985-86*	-	1318	1998-99†	1633	1594
1986-87†	1410	1382	1999-00†	1633	1741
1987-88†	1568	1386	2000-01†	1633	1658
1988-89†	1611	1412	2001-02†	1633	1729
1989-90†	1627	1374	2002-03†	1633	1730
1990-91†	1627	1729			
1991-92†	1627	1700			
1992-93†	1633	1654			
1993-94†	1633	1594			
1994-95†	1633	1580			
1995-96†	1633	1551			

*** = FSU data;**
† = QMS data

Non-commercial customary fishery

52 No quantitative information is available on the level of customary Mäori catch but tarakihi is known to be an important species to customary fishers.

Recreational fishery

53 Recreational fishing surveys have been undertaken in 1991-92, 1996, 1999-00, and 2000-01 to provide recreational harvest estimates. The Recreational Fisheries Working Group meeting in October 2003 concluded that the 1991-92 (plus other regional estimates in 1992-93, and 1993-94), and the 1996 harvest estimates should no longer be used. The Working Group was satisfied with the general methodology of the 1999-00 survey, and that the results from the 1999-00 survey, and the 2000-01 follow-up survey, were acceptable. However, results from the 2000-01 follow-up survey have not yet been finalised.

54 The point estimate for TAR 2 in the 1999-00 survey was 191 tonnes, with a range of 139 – 243 tonnes. However, caution needs to be exercised with the interpretation of some results, particularly for QMA 2 fishstocks, and where the coefficient of variation (c.v.) is high.

Other sources of mortality

55 No quantitative information is available on the level of illegal catch or other sources of mortality. Since the major part of the catch is taken by bottom trawl gear, it will have an element of mortality associated with tarakihi that might escape through the net. Minimum legal size applies to tarakihi, so some mortality must be associated with the capture and release of undersized fish.

ANNEX TWO

Relevant Information from the 2003 AMP Plenary

56 The 2003 AMP Plenary made the following statements regarding the fit to the AMP stock assessment criteria for the TAR 2 fishery:

Stock assessment criteria

57 Standardized trawl CPUE, regarded to be a reasonable index of abundance for TAR 2, has increased steadily since 1995/96. The Plenary concluded that:

a) There is reasonable probability that the current biomass is greater than B_{MSY};

b) On balance the proposed increase in TACC is likely allow the stock to move towards B_{MSY}; and

c) Stock abundance appears to be increasing under current catch levels.

Monitoring criteria

58 The Plenary agreed that the following monitoring measures would be necessary:

a) Implementation of a SeaFIC logbook programme. As most operators are members of the Area 2 Inshore Finfish Management Company Ltd, coverage is expected to be high. Amongst other things, this should allow an evaluation the impact of the increase in TAR 2 TACC on associated species, particularly SNA 2; and

b) Collection of biological information (e.g. length, sex, otoliths) through ongoing shed sampling - thereby providing a means to detect changes in age/size structure.

59 If sufficient data is collected and a suitable signal is contained in the abundance index, a full stock assessment will be competed.

Decision rule criteria

60 The Plenary regarded decision rules to be unnecessary on the grounds that a full analysis of all information every two to three years is a more effective way to review the performance of the stock. If successful the AMP will undergo a full review in March 2007, and again in 2010.

Environmental considerations

61 The Plenary noted that it is theoretically possible, through spatial adjustments in effort, to achieve a 10% increase in TAR 2 catch without an overall increase in trawl effort in FMA 2. In other words increases in trawl effort are expected to be lower than 10% and environmental affects associated with this are expected to be small. The mix-species set net fishery in FMA 2 is responsible for only about 0.5% of the annual catch.

ANNEX THREE

Statutory Considerations

62 In developing the management proposal the following statutory considerations have been taken into account:

TAC

63 The purpose of the Act, as outlined in s 8, is to provide for the utilisation of fisheries resources while ensuring sustainability. The management proposal for TAR 2 seeks to ensure sustainability of the stock by setting a TAC that recognises that the TAR 2 stock is probably above the level that would produce the MSY, and at the same time, advocating a research programme that will collect detailed information from the fishery. This information will be used to assess fishery status under the proposed TACC increase. In conjunction with existing sustainability measures and management controls (including amateur bag limits, minimum legal size, net mesh size and deemed values), the proposed TAC and monitoring programme seek to ensure the sustainability of the TAR 2 stock. Utilisation is provided for by way of setting allowances for commercial, recreational and customary fishers. The proposed TACC increase and monitoring programme will provide for better commercial returns and input into the fishery, and create the potential for people to provide better for their social, cultural, and economic wellbeing;

64 The TAC set by the Minister under s 13(2) should be set to move the stock towards or above the level that can produce MSY. That level is currently not known for TAR 2, but the catch levels and CPUE information suggests that there is a reasonable probability that the biomass is greater than the size that will produce MSY. The best available information indicates that current non-commercial catch and the proposed increased TACC will be likely to allow the stock to move towards the level that would produce the MSY. Monitoring and review under the AMP will mitigate the risks to sustainability under the proposed increased TACC.

Environmental

65 The proposed TAC includes consideration of the following:

a) No explicit consideration has been given to specific environmental conditions that may affect the stock or the biological characteristics of the stock as required to be considered under s 13(2)(b)(ii) because the best available information indicates that the stock is above the level that can produce the MSY; and

b) The interdependence of stocks in respect of the setting of the TAC, as required to be considered under s 13(2)(c). There is no evidence to suggest that the interdependence of stocks are of significant magnitude to impact on the setting of the TAC. Snapper, gurnard, barracouta, hoki, blue moki and trevally are commonly taken in trawls targeting tarakihi in TAR 2. However, all these species are managed within the QMS. In addition, **Area 2** has undertaken to examine the effects of an increase in TAR 2 catch on bycatch stocks as part of its proposed monitoring programme;

66 Section 9(a) requires 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 2 fishery and non-harvested species that are of concern or specific to the fishery;

67 Section 9(b) requires that the biological diversity of the aquatic environment should be maintained. Bottom trawling is likely to impact the benthos and benthic habitat. However, there are no known impacts on biodiversity that would be specific to the TAR 2 trawl fishery. The bottom trawl TAR 2 fishery occurs on soft-sediment substrate and the damage to the more sensitive hard substrate is likely to be minimal in this fishery. In addition, it is theoretically possible, through spatial adjustments in effort, to achieve a 10% increase in TAR 2 catch without an overall increase in trawl effort in TAR 2. In other words, increases in trawl effort are expected to be lower than 10% and environmental effects associated with this are expected to be small. As discussed in the main section of the paper, there is unlikely to be any bycatch problems with Hectors dolphin under the proposed TAC;

68 Section 9(c) of the Act requires that habitats of particular significance to fisheries management should be protected. No habitats of particular significance to fisheries management are known that might be affected by tarakihi trawling in TAR 2, and none are specifically protected from the effects of trawling for tarakihi;

69 MFish is unaware of any information on the natural variability of the TAR 2 stock, as required to be considered by s 11(1)(c). The long stable catch history and recent CPUE trend would suggest that TAR 2 is not prone to significant natural biomass fluctuations. However, research shows that the TAR 3 stock is prone to biomass fluctuations, and trawl surveys targeting TAR 2 between 1993 and 1996 showed high variability in relative biomass (although the results of the trawl surveys were questionable in a statistical sense). Reviews of the fishery under the proposed AMP will need to consider these factors;

Allocation

70 Section 13(3) requires the consideration of relevant social, cultural and economic factors when determining the way and rate in which a stock is moved towards or above a level that can produce the MSY. The economic benefits that will be realised under the proposed TAC will primarily be greater revenue from an increased TAR 2 commercial catch without the need to pay deemed values;

71 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. No mātaitai exists in the QMA. No area has been closed or fishing method restricted (that affects the TAR 2 fishery) under the customary fishing provisions of the Act. No restrictions have been placed on fishing in any area within the QMA for recreational interests using the provisions in s 311 (s 21).

Miscellaneous

72 There is a wide range of international obligations relating to fishing (including the sustainability and utilisation of fishstocks, and the maintenance of biodiversity). MFish considers that there are no issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 that

are not adequately addressed in the management options proposed for TAR 2 (s 5(a) and s 5(b));

73 Apart from the existing TACC, other important existing fisheries management controls for TAR 2 include the following (as required to be considered per s 11(1)(b)):

- A minimum legal size of 25 cm fork length and a minimum net mesh size of 100 mm apply in TAR 2;

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

- Trawling is prohibited by fisheries regulations in some inshore areas within TAR 2. These areas are described in the Fisheries (Central Area Commercial Fishing) Regulations 1986. It is not known what degree of protection these measures provides for non-commercial tarakihi fishing interests;

74 The Minister is required to take into account any relevant fisheries plan before setting or varying any sustainability measure (s 11(2A)(b)). A fisheries plan could provide another mechanism through which to explore the potential of the TAR 2 fishery. A fishery plan has not been developed or approved to date but Area 2 advise that the AMP proposal is considered a precursor to a fisheries plan;

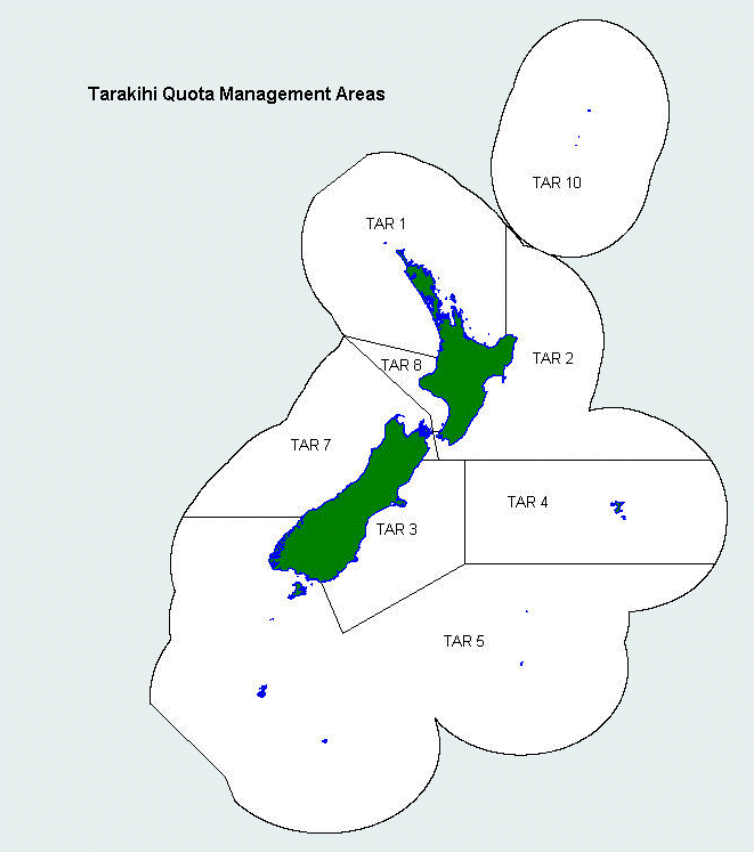
75 Before setting or varying any sustainability measure the Minister must take into account any conservation or fisheries service, or any decision not to require such services (s 11(2A)(a)&(c)). MFish does not consider that existing or proposed services materially affect this proposal for TAR 2. No decision has been made not to require a service in this fishery;

76 Section 11(2)(a) and (b) require the Minister to have regard to any provisions of any regional policy statement, regional plan or proposed regional plan under the Resource Management Act 1991 and any management strategy or plan under the Conservation Act 1987. There are no provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987, that are relevant to the setting or varying of any sustainability measure for TAR 2;

77 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 (s 10(a) – (c)). 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 (s 10(d)). MFish considers that the information used to support the TAR 2 proposal is the best available. While it is recognised that the current status of the stock is uncertain, the monitoring criteria for the proposal will allow for improved information to be obtained, and for caution to be applied using that new information.

TARAKIHI 3 (TAR 3) AMP PROPOSAL - INITIAL POSITION PAPER

Figure 1. **Map showing the boundaries of TAR 3**



Key Issues to be Considered

1 The key issues to be considered for the TAR 3 proposal are:

a) MFish has received a proposal from the South East Finfish Management Company Limited (South East FML) to increase the TACC for TAR 3 by 20 % from 1 169 tonnes to 1 403 tonnes for a five-year period under the adaptive management programme (AMP);

b) The commercial catch of TAR 3 has averaged 1 208 tonnes, or 3% over the TACC, for the three most recent fishing years to 2002-03;

c) A significant part (45%) of the TAR 3 catch is taken by target fishing. Set netting takes 32% of the total TAR 3 catch and most of it (92%) is taken by target fishing. Bottom trawling takes the largest proportion (68%) of the total tarakihi catch, some of it is taken in a target fishery but primarily it is taken as a bycatch of targeting red cod, barracouta, and flatfish;

d) The AMP Plenary in December 2003 (Plenary) agreed that the TAR 3 fishstock could be considered for inclusion in the adaptive management

programme. The increasing catch-per-unit-effort (CPUE) in the target trawl fishery since 1992-93 may indicate increased abundance of the TAR 3 fishstock;

e) The Plenary considers that although the TAR 3 stock size may be uncertain there is reasonable probability that the current biomass of the TAR 3 stock is greater than B_{MSY};

f) The TAR 3 fishery has not been managed under an AMP in the past, nor has an AMP been previously considered for the fishery; and

g) The TAR 3 AMP is being considered for a fishstock where there is a threatened population of Hector's dolphins. There is an annual set net fishing-related mortality limit of three Hector's dolphin established for the Canterbury set net area[40]. An increase in the TACC for TAR 3 may increase the risk of mortalities of marine mammals and sea birds.

Management Options

2 The proposed management framework option for the total allowable catch (TAC), TACC, and allowances for TAR 3 under the AMP framework is presented in Table 1.

Table 1: Proposed AMP management framework option for TAC/TACC increase for TAR 3

Programme	Proposed TAC (tonnes)	Customary allowance (tonnes)	Recreational allowance (tonnes)	Other sources of mortality (tonnes)	Proposed TACC (tonnes)	%TACC increase
Adaptive Management Programme	1 503	15	15	70	1 403	20

3 The proposal from the South East FML is to establish an AMP for TAR 3 for five years, beginning 1 October 2004, that will increase the TACC from 1 169 tonnes to 1 403 tonnes. South East FML will:

a) analyse standardised relative abundance indices using catch and effort data from the trawl and set net fisheries operating in the TAR 3 area;

b) maintain an existing logbook programme with the addition of tarakihi to provide high spatial resolution for TAR 3 catch and effort to monitor changes in fishing behaviour that may affect the ability of these indices to monitor the abundance of TAR 3;

c) obtain TAR 3 biological information (length, sex, otoliths) to detect changes in age/size structure from an ongoing shed sampling programme;

d) maintain a existing voluntary code of practice to reduce the risk of Hector's dolphin or seabird bycatch in the TAR 3 fishery; and

e) analyse the recent trial of video observations of interaction of fishing with marine mammals and seabirds.

4 While reviewing the TAR 3 TACC, MFish proposes to set allowances for Mäori customary non-commercial interests, recreational interests, and other sources of

[40] Coastal waters out to 4 nautical miles from the coastline between the Waiau River and the Waitaki River

fishing-related mortality. These allowances are in addition to the TACC increase proposed by South East FML.

Rationale for TAC and Allowances

Policy frameworks

5 When setting a TAC for TAR 3, a number of statutory obligations imposed by the Fisheries Act 1996 (the Act) have to be taken into account. These factors, which are considered before setting sustainability measures for TAR 3, are considered in detail in the Statutory Obligations and Policy Guidelines (see Introductory Papers) and Annex 1.

6 The Plenary has agreed that TAR 3 could be considered for inclusion in the AMP. Only one option is proposed, a TACC increase under an AMP. MFish considers that an increase to the TAR 3 TACC is better addressed within an AMP than under the low knowledge bycatch fishery framework. TAR 3 does not meet the criteria for consideration of a TACC increase under the low knowledge bycatch fishery framework as:

a) A significant component (45%) of the total TAR 3 commercial catch is targeted. Nearly all (92%) of the set net catch is from target fishing for tarakihi. A proportion (22%) of the trawl catch is taken in target fishing for tarakihi;

b) Commercial catches have only exceeded the TACC by 3% for the past three fishing years; and

c) A reasonable amount of information is available for TAR 3 (biological, and CPUE) for stock assessment purposes compared, for example, to moonfish or ghost shark.

7 Furthermore, an AMP framework has additional advantages:

a) Management of TAR 3 under an AMP reduces the risk of overfishing as the proposed AMP has appropriate monitoring and reporting arrangements to detect changes in abundance; and

b) The proposed TACC increase may increase the risk of mortalities of marine mammals and seabirds. The additional monitoring required under the AMP will provide information on commercial fishing interactions with marine mammals and seabirds.

TAC

8 When varying a TACC for a quota management stock, the Act requires that a TAC be set under s 13 or s 14 and that, within the TAC, allowances are made for non-commercial fishing interests in that stock. MFish is proposing to set the TAC for TAR 3 under s 13 of the Act because the biological characteristics of tarakihi allow an MSY to be estimated, commercial catch limits of TAR 3 are not part of any international agreement, and the fishery is not managed on a rotational or enhanced basis.

9 South East FML propose a 20% increase in the TACC for TAR 3 from 1 169 to 1 403 tonnes on the grounds that the stock appears to be increasing.

10 TAR 3 was introduced into the QMS in 1986 with a TACC of 970 tonnes. Since 1986, the TACC has increased to 1 169 tonnes as a result of quota appeals. Commercial catches of TAR 3 have been less than the TACC since the introduction of this species into the QMS, except in three of the five most recent fishing years when the TACC has been exceeded. Catches have averaged 1 208 tonnes or 3% over the TACC for the three most recent fishing years to 2002-03, and they have averaged 1 196 tonnes or 2% over the TACC for the five most recent years.

11 No quantitative assessment of the status of the TAR 3 stock relative to the stock level that would produce the MSY is available. However, the Plenary consider that there is reasonable probability that the current biomass of TAR 3 stock is greater than B_{MSY}. Standardised CPUE abundance indices show an increasing trend from 1992-93 to the present.

12 The long history of fishing of TAR 3 also indicates that historical catch levels of tarakihi off the east coast, South Island, were higher from the mid-1940s to the end of the 1960s (averaging 1 650 tonnes) than at present. Actual catches taken by foreign vessels, before they were excluded from fishing in TAR 3 by the Exclusive Economic Zone declaration in 1983, are not known but they were probably substantial and probably exceeded domestic catches. This long period of fishing at these high levels may indicate that the sustainable levels of catch for this fishstock are higher than the present TACC. The 2003 Working Group report for tarakihi (Annala 2003) states *"TAR 3 estimates made in the mid-1980s indicated that F (fishing mortality) was less than $F_{0.1}$. These estimates are probably still relevant due to the long, stable catch history in these areas. Levels of F near or below $F_{0.1}$ are generally considered sustainable."*

13 The extent of the proposed TACC increase is primarily intended to ascertain whether the TAR 3 *stock* is capable of sustaining higher catches consistent with the assumption that the stock is above the B_{MSY}. The TAC/TACC levels for TAR 3 can be reviewed if, on the balance of probabilities, it is detected that the catches under the AMP are causing the stock size to move below the level that will produce the MSY.

14 The TAR 3 AMP is being considered for a fishstock where there is a population of Hector's dolphins that is listed as a threatened species under the Marine Mammals Act 1978 (see Annex 1). The proposed 20% increase in the TACC from 1 169 to 1 403 tonnes does represent a genuine increase in fishing effort and in catch, as the average catch has only been 1 208 tonnes over the past three fishing years and, therefore, poses an increased risk to Hector's dolphins. It is not possible to quantify this increased risk.

15 The Plenary noted that the set net fishery taking tarakihi occurs in Area 018 (Kaikoura)[41] in deep water (100-200+ metres) at the shelf break.

16 Despite the increased risk from the additional fishing effort that will occur with the increased TACC, MFish considers the risk to Hector's dolphin and seabirds is probably low as:

a) South East FML introduced a voluntary code of practice in 1998[42] and the use of pingers for commercial set netters. The code of practice includes a range of measures to reduce the possibility of Hector's dolphin mortalities;

[41] The set net fishery takes 32% of the total TAR 3 catch, with 99% of this set net catch occurring in Area 018.

b) Set net fishing targeting tarakihi under the AMP will tend to be spatially separated from Hector's dolphin distribution; by being in deeper water at the shelf break off Kaikoura, beyond the main distribution of Hector's dolphins, and at the outer margin of the distribution of Hector's dolphin whose core distribution occurs in the Pegasus Bay/Banks Peninsula/Canterbury Bight area (see Annex 1);

c) Offal is not disposed of in the tarakihi fishery as tarakihi are landed green (unprocessed). For any other species caught offal is not disposed of during net retrieval, as there are insufficient people on these vessels to retrieve the net and process the fish simultaneously (see Annex 1); and

d) The trawl fishery also has prohibited fishing zones close inshore, by regulation and voluntary agreement, that will assist in mitigating the risk of further entanglements of Hector's dolphin (see Annex 1).

17 In addition, South East FML currently has a trial of video monitoring of small fishing vessels in QMA 3 as a potential monitoring method for observing interactions of fishing with marine mammals and sea birds.

18 In the absence of stock assessment information, proposed TACs for fisheries are usually based on known or estimated levels of recreational, Mäori customary, and commercial catch together with an estimate of all other sources of fishing-related mortality. In the absence of stock assessment information, this is the best information available on which to set a TAC that maintains the stock at or above the level that can produce the maximum sustainable yield. The allowances proposed, including that for other sources of fishing-related mortality, are in addition to the TACC increase proposed by South East FML. Accordingly, the proposed TAC of 1 503 tonnes for TAR 3 has been derived by summing the proposed TACC, under the AMP, with estimates of recreational, Mäori customary harvests, and other sources of fishing-related mortality.

Monitoring – stock issues

19 Given that fisheries-independent trawl survey information is difficult to obtain for TAR 3, South East FML proposes to derive TAR 3 relative abundance CPUE indices from trawl and set net fishing events that target or catch tarakihi. Supplementary information will be obtained from SeaFIC logbooks placed on a representative selection of bottom trawl (targeting red cod, barracouta, and tarakihi) and target set net vessels (in Area 018) to monitor any changes in fishing behaviour that may effect the ability of commercial CPUE to monitor the abundance of TAR 3. Collection of biological information (length, sex, otoliths) from a shed sampling programme is proposed to detect changes in age/size structure.

20 The Plenary agreed that the analysis of CPUE data from the trawl and set net fisheries recorded in MFish catch and effort logs can be used to monitor the TAR 3 stock. The Plenary noted that it is necessary to take into account the existing spatial trends in size/age structure of TAR 3 when designing a shed sampling programme to monitor population structure. To provide a representative picture of the TAR 3 fishery,

[42] Further information on the impacts of fishing and code of practice are to be found in the *TAR 3 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 4 September 2003, produced by the South East Finfish Management Company Limited. This document can be accessed on the Ministry of Fisheries website, as detailed in Annex 2.

MFish considers that the logbook scheme for TAR 3 should monitor at least 30% of both sets and trawls.

21 South East FML claim to represent quota holders totalling 1 073 tonnes or 92% of the total TAR 3 quota. There is an existing set net logbook scheme in FMA 3. With the high representation South East FML has of quota owners, and as there is an existing logbook scheme, it should be possible to monitor at least 30% of both sets and trawls.

22 MFish considers that the monitoring (as agreed by the Plenary and with coverage of 30% of both set net and trawl fishing effort) of commercial CPUE, a logbook scheme and collection of biological data should detect any risks to the sustainability of TAR 3 at the increased TACC level.

Monitoring – Hector's dolphins/seabirds

23 An independent observer programme of inshore vessels in QMA 3 has been attempted but this has largely been unsuccessful. This has led to a trial of video monitoring of inshore trawl and set net fishing vessels as a an alternative (see Annex 1).

24 MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the TAR 3 fishery. South East FML is strongly encouraged to complete the video monitoring trial and, depending on results, to implement an appropriate monitoring programme as soon as possible. The TAR 3 AMP will be reviewed in 2007, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

Monitoring – proposed requirements

25 MFish proposes the following requirements for monitoring of the AMP; that South East FML will:

a) implement a logbook programme to monitor at least 30% of both trawl and set net fishing events to provide high spatial resolution for TAR 3 catch and effort;

b) implement collection of TAR 3 biological information (length, sex, otoliths) from a fishshed sampling programme;

c) maintain an existing voluntary code of practice to reduce the risk of Hector's dolphin or seabird bycatch and to continue to implement measures to mitigate potential impacts for marine mammals and seabirds in the TAR 3 fishery;

d) analyse standardised CPUE on the MFish commercial fisheries catch & effort database for trawl and set net fisheries taking tarakihi in TAR 3;

e) provide annual updates to MFish on the amount of coverage of fishing effort in the fishery, logbook compliance, collection of biological information, and monitoring of fishing-related mortality (including development of an independent monitoring programme); and

f) provide full reports to the AMP Working Group and Plenary, in 2007 and 2010, on standardised CPUE analysis for the TAR 3 fishery, biological information, and monitoring of fishing-related mortality.

TACC

26 The AMP proposal by South East FML is to increase the TACC of TAR 3 by 20% from 1 169 tonnes to 1 403 tonnes.

27 There should be economic benefits that extend from this cost-effective gathering of information from the fishery. The information could result in improved assessment of the TAR 3 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

28 Increasing the TAR 3 TACC, as proposed, has economic costs because of the required monitoring. The increase also has economic benefits in the short term. The port price was $1 335.80 per tonne (as at 30 September 2003), so that the 234 tonne increase in the TACC has a gross value of $312 000 domestically, without taking any account of export value. There will be economic benefits to industry from the lower total cost of deemed values paid.

29 But, longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

30 MFish considers that the proposed increased TAR 3 TACC is unlikely to affect the size and availability of tarakihi for non-commercial fishers as the significant tarakihi inshore areas where TAR 3 is easily available are either closed to commercial fishing (mätaitai reserves at Rapaki and Koukourarata (Port Levy) on Banks Peninsula, trawling and set netting closures near river mouths and in parts of harbour areas by regulation) or the commercial fishing industry voluntarily refrains from fishing in some areas (Canterbury Bight out to one nautical mile in summer months).

Customary and recreational

31 The estimated recreational harvest for TAR 3 was 15 tonnes in the 1999-00 recreational fishing survey, with a range of 8 – 23 tonnes (see Annex 2).

32 MFish proposes that the Minister set allowances for recreational fishers as outlined in the Statutory Obligations and Policy Guidelines section. The allowances proposed for recreational use of the tarakihi fishery reflect the likely level of fishing activity.

33 Only small amounts of tarakihi have been recorded as being taken under authorisations for customary food gathering. Tarakihi, however, are known to be of considerable importance to customary fishers on the east coast South Island. MFish proposes that the Minister set an allowance for customary fishers, as outlined in the Statutory Obligations and Policy Guidelines section, at a catch level similar to the known recreational catch.

34 MFish proposes that the allowances for recreational and customary harvest be set at 15 tonnes each.

Other sources of fishing-related mortality

35 No quantitative information is available on the level of illegal catch or other sources of fishing-related mortality.

36 Most of the TAR 3 catch is taken by target set net fishery and as a bycatch of trawl fisheries for other species. MFish considers that an allowance should be made for incidental mortality of injured fish escaping from trawl and set nets and from the capture and release of undersize fish, as discussed in Annex 2.

37 MFish proposes that the allowance for other sources of mortality caused by fishing be set at 5% of the TACC proposed under the AMP programme, that is, 70 tonnes. The allowance proposed for other sources of fishing-related mortality is in addition to the TACC increase proposed by South East FML.

Future Management

38 The AMP programme for TAR 3 is proposed to run for 5 years. The TAR 3 AMP will be reviewed annually for performance of the agreed monitoring requirements and a full review will be completed after two years and at the end of the programme.

39 MFish will be undertaking further surveys to determine the levels of recreational catch (including TAR 3) over the next five years, and estimates of customary Mäori catch might also be available from reporting under the Fisheries (South Island Customary Fishing) Regulations 1999.

40 Depending on the outcome of the programme, stock assessment, and revised estimates of non-commercial catches, MFish may propose the reconsideration of sustainability and utilisation measures for TAR 3.

41 A key consideration at the completion of the five-year period will be whether or not the TACC should revert back to the current level. The AMP is primarily intended as an information gathering mechanism to assess whether or not a stock is capable of providing a greater yield. The alternative to the AMP is that conventional stock assessment techniques are employed to assess the fisheries yield. These techniques do not necessarily involve an increase in the TAC and TACC.

Conclusion

42 South East FML has proposed a 20% increase to the TACC from 1 169 to 1 403 tonnes under a new AMP.

43 The Plenary consider that, although the TAR 3 stock size may be uncertain, there is reasonable probability that the TAR 3 stock has increased to a level above B_{MSY}. The Plenary concluded that TAR 3 should be considered for inclusion in an AMP.

44 The main objective of the proposal is to ascertain whether the TAR 3 stock is capable of sustaining higher catches consistent with the assumption that the stock is above the B_{MSY}.

45 MFish considers it has taken into account the statutory obligations required by the 1996 Act in evaluating this management proposal, as detailed in Annex 1.

46 MFish considers that the proposed increased TAR 3 TACC is unlikely to affect the size and availability of tarakihi for non-commercial fishers as the significant tarakihi inshore areas where TAR 3 is easily available are either closed to commercial fishing (mätaitai reserves at Rapaki and Koukourarata on Banks Peninsula, trawling and set

netting closures near river mouths and in parts of harbour areas by regulation) or the commercial fishing industry voluntarily refrains from fishing in these areas (Canterbury Bight out to one nautical mile in summer months).

47 Standard requirements are in place to report interactions with seabirds and marine mammals. Irrespective of catch levels, the previous Minister of Fisheries has decided to manage set net fishing-related mortalities within a limit of three Hector's dolphins for the Canterbury set net area and has encouraged set net fishers in TAR 3 to develop and implement set net codes of practice. South East FML's upgrading of their set net code of practice, use of pingers, and the video monitoring trial is likely to further mitigate their fishing impacts on Hector's dolphin and other marine mammals and seabirds. MFish is of the view that the proposed increase in the TACC does increase the risk of further mortalities of marine mammals and seabirds. Taking into account that the set net tarakihi fishery tends to be spatially separated from Hector's dolphin distribution (by being in deeper at the shelf break off Kaikoura, beyond the main distribution of Hector's dolphins, and at the outer margin of the distribution of Hector's dolphin whose core distribution occurs in the Pegasus Bay/Banks Peninsula/Canterbury Bight area) and the mitigation measures, this increased risk is likely to be low.

48 MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the TAR 3 fishery. South East FML is strongly encouraged to complete the video monitoring trial and to implement an appropriate monitoring programme as soon as possible.

Preliminary Recommendations

49 MFish proposes, under the AMP, to include a new five-year programme for tarakihi in TAR 3 that will:

a) set the TAC for TAR 3 at 1 503 tonnes;

b) allow 15 tonnes for customary fishing;

c) allow 15 tonnes for recreational fishing;

d) set the allowance for other sources of fishing-related mortality at 70 tonnes;

e) increase the TACC from 1 169 tonnes to 1 403 tonnes;

f) require South East FML to implement a logbook programme to monitor at least 30% of both trawl and set net fishing events to provide high spatial resolution for TAR 3 catch and effort;

g) require South East FML to implement collection of TAR 3 biological information (length, sex, otoliths);

h) require South East FML to maintain an existing voluntary code of practice to reduce the risk of Hector's dolphin or seabird bycatch;

i) require South East FML to analyse standardised CPUE on the MFish commercial fisheries catch & effort database for set net and trawl fisheries taking tarakihi in TAR 3;

j) require South East FML to provide annual updates to MFish on the amount of coverage of fishing effort in the fishery, logbook compliance, collection of biological information, and monitoring of fishing-related mortality;

k) require South East FML to provide full reports to the AMP Working Group and Plenary, in 2007 and 2010, on standardised CPUE analysis for the TAR 3 fishery, biological information, and monitoring of fishing-related mortality; and

l) require South East FML to continue to implement measures to mitigate potential impacts of fishing on Hector's dolphins and seabirds. In particular, require South East FML to implement an appropriate monitoring programme as soon as possible.

ANNEX ONE

Statutory Considerations

TAC

50 The purpose of the Act (s 8) is to provide for the utilisation of fisheries resources while ensuring sustainability. Utilisation as defined in the Act includes developing fisheries. The adaptive management proposal for TAR 3 is intended to provide a structured and monitored way to explore the development opportunities of the fishery, while ensuring sustainability. The increased TACC, and setting allowances, will provide for developing the fishery and create the potential for people to provide better for their social, cultural, and economic wellbeing.

51 The TAC should be set, under s 13, to move the stock towards or above the level that can produce MSY. The Plenary reported that, although the stock size for TAR 3 is uncertain, catches and CPUE have been increasing in recent years and there is a reasonable probability that the biomass is greater than the B_{MSY}. The Plenary concluded that the proposed increase in the TACC is likely to allow the stock to move towards the level that would produce the MSY over the five-year programme. The Plenary also concluded that annual monitoring and review under the AMP would mitigate the risks to sustainability under the proposed increased catch levels.

52 A range of species is likely to be caught in the target trawl fishery for TAR 3. The three most significant commercial species taken in the TAR 3 bottom trawl fishery in 2000–01 were red cod, tarakihi and barracouta, 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 3 at this time (s 13(2)(b)(1)).

53 There should be economic benefits that extend from the cost-effective gathering of information from the fishery. This information could result in improved assessment of the TAR 3 stock status relative to the level that would produce the MSY. Improved assessments of the stock and yields at the conclusion of the programme will enhance the long-term sustainable utilisation of the fishery.

54 Increasing the TAR 3 TAC, as proposed, will have economic benefits in the short term, but longer-term benefits will be dependent on stock status. Earnings from the fishery are likely to increase with greater catches, with additional positive downstream implications for the industry possible.

55 Tarakihi are also taken as a bycatch in other target trawl and set net fisheries. A higher TACC for TAR 3 might make it easier for fishers to obtain the ACE to cover their bycatch of tarakihi.

56 MFish notes that the developmental opportunity created provides potential for greater economic benefits without creating any anticipated social, economic or cultural issues for other sectors (s 13 (3)).

57 The TAR 3 fishery is prone to significant fluctuations in biomass. The Canterbury Bight trawl fishery is dependent on a few strong year classes of young fish being recruited into the fishery. Research has indicated that substantial recruitment variability has contributed to the variations in catches. MFish notes that biomass fluctuations occur in TAR 3, and this will need to be addressed as part of the review of the AMP (s 11 (1)(c)).

Effects of fishing/environmental considerations

58 The adverse effects on the aquatic environment of the management measures must be taken into account when considering increasing the TAC and TACC.

59 The Plenary noted that most of the TAR 3 catch is taken by the target set net fishery, and both as a target trawl, and as a bycatch in trawl fisheries for other species.

60 The TAR AMP is being considered for a fishstock where there is a population of Hector's dolphins that is listed as a threatened species under the Marine Mammals Act 1978. Based on the US National Marine Fisheries Service model for calculating fishing-related mortality limits, the previous Minister of Fisheries established an annual set net fishing-related mortality limit of three Hector's dolphin in the Canterbury set net area. If the limit of three dolphins is exceeded the Minister of Fisheries will have to decide what appropriate action has to be taken. The previous Minister of Fisheries also encouraged set net fishers in TAR 3 to develop and implement set net codes of practice.

61 The Plenary noted the on-going concern about the bycatch of Hector's dolphin in east coast South Island fisheries. The Plenary noted that, although South East FML has introduced use of pingers and a voluntary code of practice, which may have reduced current rates of dolphin mortality, it is unknown whether an increased TAR 3 TACC would increase dolphin interactions. The Plenary noted that the set net fishery taking tarakihi occurs in Area 018 (Kaikoura) in deep water (100-200+ metres) at the shelf break. This may be outside the preferred habitat for Hector's dolphins, which are thought to be less abundant in Area 018 compared to the population in the Pegasus Bay/Banks Peninsula/Canterbury Bight area.

62 MFish notes that there have been some mortalities of Hector's and Dusky dolphins that may be attributed to set netting in the Kaikoura and Moeraki areas over the past summer. MFish notes that only 39 tonnes (17%) of the proposed 234 tonne increase in the TACC (from 1 169 to 1 403 tonnes) has been taken on average in the three most recent fishing years. Therefore, the proposed TACC increase will represent a genuine increase in fishing effort and in catch. The degree of risk of a fishing-related mortality is related to the local abundance of Hector's dolphins and the frequency of fishing in that area. It is apparent that fishing in the area of the animals' core distribution (in the Pegasus Bay/Banks Peninsula/Canterbury Bight area) would pose the greatest risk of a fishing-related mortality, while fishing in Area 018 poses a lower risk in spite of the high level of set netting for tarakihi in that area.

63 MFish notes that South East FML has been active in upgrading their code of practices and other measures to mitigate the risk of further Hector's dolphin entanglements. An independent observer programme has been attempted but this has largely been unsuccessful because of various logistical problems. This has led to a trial of video monitoring of inshore trawl and set net fishing vessels as a substitute for having independent observers onboard vessels. The trial is to test the feasibility of video

monitoring of inshore vessels in QMA 3 as a potential monitoring method for observing interactions of fishing with marine mammals and sea birds.

64 The Plenary considered that other environmental impacts associated with an increased TAR 3 TACC were not likely to be substantial or significant. Target trawling occurs throughout TAR 3, largely between the 100 and 200 metre depth contours. Bottom trawl gear, by its very action, affects the physical structure of the substrate and the benthic community. The proposed increased catch under the AMP is about 250 tonnes less than the catches taken during the mid-1940s to the end of the 1960s, when it averaged 1 650 tonnes. The increased catch is likely to have less adverse effects than during the peak catches in 1940s-1960s. It is probable that the increased catch of tarakihi will be taken on the established fishing grounds, as tarakihi is a long-established fishery, rather than in new areas.

65 Section 9(a) requires a decision maker to consider the principle that associated or dependent species (non-harvested species) should be maintained above a level that ensures their long-term viability.

66 Tarakihi is landed ashore green (unprocessed). For any other bycatch species caught, offal is not disposed of during net retrieval as there are insufficient people on these vessels to retrieve the net and process the fish simultaneously. So, the fishery does not dispose of any significant amount of fish waste or offal at sea, thereby reducing the potential for interactions with seabirds. The draft Seabird Interaction with Fisheries in the New Zealand Exclusive Economic Zone - A Review and National Plan of Action 2000 (NPOA) document does not list tarakihi as one of the fisheries that are of concern regarding with seabird interactions.

67 MFish is of the view that these factors, taken together, suggest that the proposed increase in the TAR 3 TACC does increase the risk of mortalities of marine mammals and seabirds. The extent of this increased risk is unknown. Given that TAR 3 set netting is not in the main distribution area of Hector's dolphin in QMA 3, with minimal offal problems, and with the mitigation measures in place, it is probable that the increased risk is low.

68 However, MFish remains concerned about the lack of information pertaining to marine mammal and seabird interactions in the TAR 3 fishery. South East FML is strongly encouraged to complete the video monitoring trial and, depending on results, to implement an appropriate monitoring programme as soon as possible. The TAR 3 AMP will be reviewed, in 2007 and 2010, and the progress and results of marine mammal and seabird monitoring will be taken into account at this time.

69 The Act requires a decision maker to consider the principles that biological diversity of the aquatic environment should be maintained and that habitats of particular significance to fisheries management should be protected (s 9). There are no other known impacts on biodiversity that would be specific to the TAR 3 trawl fishery.

70 MFish notes that a number of habitats of particular significance to fisheries management are closed by regulation including some of the close inshore bay and harbour areas in Canterbury and Otago. The commercial fishing industry has voluntarily closed an area to trawling, off Otago Peninsula as a measure to avoid the adverse effects of fishing on the unique bryozoan biodiversity there. Reporting of bycatch and protected species will allow for information to be collected to advance our knowledge of potential impacts.

Other statutory considerations

71 There is a wide range of international obligations relating to fishing (including sustainability and utilisation of fishstocks and maintaining biodiversity). MFish considers that all issues arising under international obligations and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 are adequately addressed in the management options proposed for TAR 3 (s 5(a) & (b)).

72 Apart from the existing TAC, TACC, and allowances, other important existing fisheries management controls under the 1996 Act for TAR 3 include the following:

- A minimum legal size of 25 cm fork length and a minimum net mesh size of 100 mm for both commercial and recreational fishers[43];
- The amateur daily bag limit in TAR 3 is 15 tarakihi for recreational fishing within a combined daily bag limit of 30 finfish[44];
- Trawling is prohibited in Pegasus Bay, from Waimakariri River to Godley Head[45]. Trawling, purse seining, teichi netting, and set nets greater than 1000 m are prohibited in harbours; Akaroa Harbour, Timaru Harbour, Oamaru Harbour, Otago Harbour, Le Bons Bay[46]. Set netting and trawling is prohibited from January to April each year near major river mouths; Waiau, Hurunui, Waimakariri, Rakaia, Ashburton, Rangitata, Orari, Opihi, Waitaki[47]. Trawling by vessels over 46 metres length is prohibited within New Zealand Territorial Waters[48]. Commercial fishing is prohibited in mātaitai reserves at Rapaki and Koukourarata (Port Levy) on Banks Peninsula;
- In order to mitigate mortalities of marine mammals, recreational set netting is prohibited from October to March each year in coastal waters to 4 nautical miles seaward of the coast from the Waiau River to the Waitaki River[49].

73 All fishing is prohibited in the Pohatu Marine Reserve, near the entrance to Akaroa Harbour.

74 The commercial fishing industry also voluntarily refrains from fishing close inshore in the Canterbury Bight (out to one nautical mile in summer months). The Banks Peninsula Marine Mammal Sanctuary, under the Marine Mammals Protection Act 1978, prohibits all set netting from October to March from Sumner Head to the Rakaia River extending seaward to 4 nautical miles (s 11(1)(b)).

75 A fishery plan could provide another mechanism through which to explore the potential of the TAR 3 fishery, however, a fishery plan has not been developed or approved to date (s 11(2A)(a), (b), & (c)).

76 Before setting or varying any sustainability measure for TAR 3, the Minister must take into account any provisions of any regional policy statement, regional plan, or

[43] Regulation 31, Fisheries (Commercial Fishing) Regulations 2001; and Regulation 6(2), Fisheries (Amateur Fishing) Regulations 1986
[44] Regulation 3A, Fisheries (South-East Amateur Fishing) Regulations 1986
[45] Regulation 4 (a), Fisheries (South-East Commercial Fishing) Regulations 1986.
[46] Regulation 3D of the above regulations.
[47] Regulation 5 of the above regulations.
[48] Regulation 47A, Fisheries (Commercial Fishing) Regulations 1986
[49] Fisheries (Canterbury Set Net Area Amateur Prohibition) Notice 2002 (No. F208)

proposed regional plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987.

77 Before setting or varying any sustainability measure for TAR 3, the Minister must take into account any provisions applicable to the coastal marine area known to exist in any policy statement or plan under the Resource Management Act 1991, or any management strategy or plan under the Conservation Act 1987. Within TAR 3, there are three Department of Conservation conservancies (Nelson/Marlborough, Canterbury, and Otago) that have produced conservation management strategies under the Conservation Act 1987. These strategies identify a number of issues. The ones of significance to the TAR 3 fishery are advocating for the sustainable use of marine fisheries and promoting the protection of significant marine ecosystems from the adverse effects of fishing practices.

78 A particular issue for TAR3 is the development and implementation of a population management plan for Hector's dolphin and a proposal to establish a marine mammal sanctuary around Porpoise Bay in the Catlins. The proposed TACC increase under this AMP and the subsequent monitoring is designed to ensure that sustainable use of this resource is achieved, while carefully monitoring for any additional impacts on marine ecosystems or marine mammals. In the absence of a completed population management plan, the use of pingers, voluntary code of practice, and the video monitoring trial have been adopted by industry to reduce the possibility of dolphin mortalities associated with the commercial fishery (s 11(2)(a)).

79 There are three regional councils with jurisdictional boundaries within TAR 3; Canterbury, Otago, and Southland. Of these, only the Otago Regional Council has a fully operational regional coastal plan under the Resource Management Act 1991, while Environment Canterbury, and Environment Southland have partially operational regional plans, as parts of their respective plans are subject to appeals to the Environment Court. These plans have been examined, and there are no provisions applicable to the proposed TACC increase under this TAR 3 AMP (s 11(2)(b)).

80 The nature of the fishery and the interests of the respective fishing sectors have been considered in setting the TACC and allowances for recreational and customary interests and all other mortality to the stock caused by fishing. Two mātaitai reserves exist in the QMA, at Rapaki and Koukourarata (Port Levy) on Banks Peninsula. A small area has been temporarily closed at Kaikoura under the customary fishing provisions of the Act. No restrictions have been placed on fishing in any area within the QMA for recreational interests using the provisions in s 311 (s 21(1)(a) & (b), 4(i) & (ii), (5)).

81 The information principles of the Act require that decisions be based on the best available information, take into account any uncertainty of this information, and apply 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.

82 MFish considers that the information used to support the TAR 3 proposal is the best available. The stock information has been reviewed by the AMP Working Group and by Plenary. While it is recognised that the current status of the stock is uncertain, the monitoring criteria for the proposal will allow for improved information to be obtained, and for caution to be applied when using new information (s 10). There is

limited information on marine mammal and seabird interactions with the TAR 3 fishery, and that information is uncertain. MFish does not believe that the uncertainty about the stock status is a reason to prevent the Minister from approving this AMP.

ANNEX TWO

Biological Characteristics

83 Tarakihi spawn during summer-autumn in several areas around New Zealand. The postlarval stages appear to be pelagic, with metamorphosis to juvenile stages occurring in spring-early summer at lengths of 7-9 cm (FL - fork length) at age of seven-12 months. Juvenile nursery areas are in shallower, inshore areas, and juveniles move out to deeper water at about 25 cm FL and age three to four years.

84 Sexual maturity is reached at 25-35 cm FL and age four to six years, after which the growth rate slows.

85 The best estimate of natural mortality (M) is 0.10. The maximum age exceeds 40 years, and there are generally 10 year classes in the fishery.

86 Tagging experiments indicate that some tarakihi move long distances. The long pelagic larval phase suggests that larvae will be widely dispersed. There is no evidence of any genetic isolation. These factors, together, suggest that tarakihi around the main islands of New Zealand consist of one continuous stock.

Catch Information

Commercial fisheries

87 The commercial tarakihi fishery in TAR 3 is long-established, producing sizeable catches since the early 1930s. Commercial catches in TAR 3 historically were higher from the mid-1940s to the end of the 1960s (averaging 1 650 tonnes) than at present. Actual catches taken by foreign vessels, before they were excluded from fishing in TAR 3 by the Exclusive Economic Zone declaration in 1983, are not known but they were probably substantial and probably exceeded domestic catches.

88 Commercial catches have been below or about the TACC since the inception of the QMS (Table 2). They declined to less than 750 tonnes in 1993-94 (the lowest since TAR 3 entered the QMS), but have since shown a steady increase to over 1 200 tonnes per year in the three most recent fishing years.

89 Approximately two thirds (68%) of the annual catch is taken by bottom trawling throughout TAR 3, with the remainder taken by set net (32%).

90 The set net fishery takes most (99%) of its tarakihi catch in the northern part of TAR 3 in Area 018 (Kaikoura), with the remainder in Area 024 (Otago). The trawl fishery takes tarakihi throughout the inshore areas in TAR 3, but the predominant areas are 020 (Pegasus Bay) with 35% and 022 (Canterbury Bight) with 43% of the total trawl catch.

91 A significant component (45 %) of the total TAR 3 commercial catch is targeted. Nearly all (92 %) of the set net catch is from a target fishery for tarakihi. A proportion (22%) of the trawl catch is taken in a target fishery for tarakihi. The remainder of the trawl catch is taken as a bycatch, mainly while targeting red cod, barracouta, and flatfish.

92 The initial TACC for TAR 3 that was set upon entry to the QMS in 1986 was 970 tonnes (increased to 1 169 tonnes through quota appeals). Since that time, the commercial catches have been below or about the TACC, except in three of the five most recent fishing years when the TACC has been exceeded. Catches have averaged 1 208 tonnes or 3% over the TACC for the three most recent fishing years to 2002-03, and they have averaged 1 196 tonnes or 2% over the TACC for the five recent years.

Table 2: Reported landings (tonnes) and TACCs (tonnes) of tarakihi from TAR 3 from 1986–87 to 2001-02.

Year	Landings (tonnes)	TACC (tonnes)
1986–87	938	970
1987–88	1 024	1 036
1988–89	758	1 061
1989–90	1 007	1 107
1990–91	1 070	1 148
1991–92	1 132	1 148
1992–93	813	1 168
1993–94	735	1 169
1994–95	849	1 169
1995–96	1 125	1 169
1996–97	1 088	1 169
1997–98	1 026	1 169
1998–99	1 097	1 169
1999–00	1 260	1 169
2000–01	1 218	1 169
2001-02	1 244	1 169
2002-03	1 162	1 169

93 Further commercial catch information can be found in the *TAR 3 Adaptive Management Programme Proposal for the 2004-05 Fishing Year*, dated 4 September 2003, produced by the South East Finfish Management Company Limited. This document can be viewed on the Ministry of Fisheries website at: <<http://www.fish.govt.nz/sustainability/research/assessment/index.html>>. You will be asked for a username and a password. The username is: workinggroup; the password is: bluenose. Under '2003 Working Group Documents' the required document is listed as 'TAR 3 AMP Proposal'.

Customary Mäori fisheries

94 Only small amounts of tarakihi have been recorded as being taken under authorisations for customary food gathering. Tarakihi, however, are known to be of considerable importance to customary fishers on the east coast of the South Island.

Recreational fisheries

95 Recreational fishing surveys have been undertaken in 1991-92, 1996, 1999-00, and 2000-01 to provide recreational harvest estimates. The MFish Recreational Fisheries Working Group meeting in October 2003 was satisfied with the general methodology of the 1999-00 survey and that the results from the 1999-00 survey, and the 2000-01 follow-up survey, were acceptable. It was noted that caution needs to be exercised with the interpretation of some figures, particularly for QMA 2 fishstocks, and where the coefficient-of-variation is high. The Working Group meeting concluded that the1999-00 survey and the 2000-01 follow-up survey generally should be used in preference to the earlier surveys.

Table 3 Estimated harvest of tarakihi by recreational fishers from recreational fishing diary surveys

Survey	Fishstock	Point estimate (tonnes)	Range (tonnes)
1991-92	TAR 3		0-5
1996	TAR 3	*	
1999-00	TAR 3	15	8-23
2000-01	TAR 3	5	NA

*** the 1996 estimate was 3 000 fish, no weight estimate was provided,**
NA = not available

96 The estimate for TAR 3 in the 1999-00 survey was 15 tonnes, with a range of 8-23 tonnes (Table 3). The estimate for 2000-01 was 5 tonnes, but a range is not yet available. From inspection of the 1999-00 and 2000-01 harvest estimates, it appears that most QMA 3 finfish harvest estimates were lower in 2000-01 compared with 1999-00. It appears that some factor(s), such as adverse weather, has affected QMA 3 catches in 2000-01. It is likely that the 1999-00 estimate of 15 tonnes better represents the total annual landed recreational catch of tarakihi in TAR 3 and is the best available information on recreational harvest in TAR 3.

97 Based on the above recreational fishing surveys, tarakihi are mainly caught by set netters and some boat fishers, in small numbers, intermittently along the coast of TAR 3. No area appears to be more important than any other.

Other sources of fishing-related mortality

98 No quantitative information is available on the level of illegal catch.

99 Since the major part of the catch is taken by bottom trawl gear and set nets, tarakihi might escape through these nets, but be fatally injured. A minimum legal size applies to tarakihi, so some mortality must be associated with the capture and release of undersized fish. Quantitative information is not available on these sources of mortality. But given the amount of tarakihi taken by trawling and set netting, the level of fishing-related mortality must be higher than in fisheries where the fish is targeted by other methods and there is no size limit.

Social, cultural and economic factors

100 Tarakihi is a valued kaimoana species for tangata whenau on the east coast of the South Island. Only small amounts of tarakihi have been recorded as being taken under authorisations for customary food gathering.

101 Tarakihi is not a major target species for recreational fishers in TAR 3. Tarakihi are mainly caught by set netters and some boat fishers, in small numbers, intermittently along the coast of TAR 3. No area appears to be more important than any other.

102 TAR 3 quota was being traded at $7 063 per tonne (as at 30 September 2003), with ACE traded at $693 per tonne. There were 59 quota owners in the fishery, and 84 ACE holders, with ACE holdings ranging from 40 holders with less than 0.5 tonnes each to three holders with more than 100 tonnes each. The port price was $1 335.80 per tonne, so that the 234 tonne increase in the TACC is valued at $312 000, domestically, without taking any account of export value.

Stock Assessment Information

103 The Plenary, in December 2003, evaluated the stock assessment criteria, decision-rules, and monitoring programme of the TAR 3 AMP proposal (dated 4 September 2003) as part of the review required for proposed AMP fishstocks. The Plenary report for TAR 3 follows:

Stock assessment criteria

104 Standardised trawl CPUE for TAR 3 has increased steadily since 1992/93. Although equivalent estimates for the set net fishery have been fairly stable, the trawl CPUE is regarded to be a better index of abundance owing to much better spatial coverage.

The plenary concluded that:

a) There is reasonable probability that the current biomass of TAR 3 is greater than B_{MSY}.

b) On balance the proposed increase in TACC is likely to allow the stock to move towards B_{MSY}

c) Stock abundance appears to be increasing under current catch levels.

Monitoring

105 The South East FML proposes the following monitoring measures for TAR 3 under an AMP programme:

a) The use of commercial CPUE from the trawl and set-net fisheries in FMA 3 to monitor the abundance of TAR 3.

b) Implementation of a SeaFIC logbook programme to monitor changes in fishing behaviour that may affect the ability of these indices to monitor the abundance of TAR 3.

c) Collection of biological information (e.g. length, sex, otoliths) through ongoing shed sampling - thereby providing a means to detect changes in age/size structure. SOUTH EAST FML is currently negotiating a suitable biological sampling strategy with the fisheries. The Plenary noted that it is necessary to take into account the existing spatial trends in size/age structure of TAR3 when designing a shed sampling programme intended to monitor population structure.

Decision rule criteria

106 The Plenary regarded decision rules to be unnecessary on the grounds that a full analysis of all information every two to three years is a more effective way to review the performance of the stock. If successful this AMP will undergo a full review in March 2007.

Environmental considerations.

107 By-catch of Hector's Dolphin in east coast South Island set-net fisheries has been an ongoing concern. Although the South East FML introduced a Code of Practice (which may have reduced current rates of dolphin mortality), it is unknown whether increases in effort associated with the proposed TAR 3 TACC would increase dolphin deaths. The setnet fishery that takes tarakihi occurs in Area 18 (Kaikoura) in deep water (100-200+ m) at the shelf break. This may be outside the preferred habitat for Hector's dolphins, which are thought to be less abundant in Area 18 compared to the population in the Banks Peninsula sanctuary area.

108 Other environmental effects of fishing associated with the proposed 20% increase in quota are not thought to be substantial or significant.

Research plan

109 There are three recent research projects that specifically relate to the TAR 3 fishery. These are:

a) Investigate inshore fish abundance along the east coast of the South Island using trawl surveys *(SOTS01)* in 1995-96; and

b) Stock assessment of tarakihi in TAR 1, 2, 3, 7 *(TAR1999/01)*.

Section Two

Conversion Factors

SHARK FINS CONVERSION FACTOR – INITIAL POSITION PAPER

Proposal

1 MFish proposes to amend the current conversion factor for shark fin weight to shark greenweight for blue shark (*Prionace glauca*) from 30.00 to 48.00 (for wet fins) and to 115 (for dry fins), for mako shark (*Isurus oxyrinchus*) from 30.00 to 59.00 (for wet fins) and to142 (for dry fins) and for porbeagle shark (*Lamna* nasus) from 30.00 to 45.00 (for wet fins) and to 108 (for dry fins). No changes are proposed for other shark species.

2 Amendments to both the Fisheries (Reporting) Regulations 2001 and the Fisheries (Conversions Factors) Notice 2000 to define new landed states and codes are proposed.

Background

3 Section 187 of the Fisheries Act 1996 (the Act) provides that all references to the weight of fish under the Act are to be to the greenweight of that fish, that is, the weight before any processing commences. In order to convert the weight of fish landed in a processed state back to greenweight, the Act provides for conversion factors. Conversion factors are determined by establishing a ratio of the weight of a known processed state to the greenweight. Under section 188 of the Act, the chief executive of the Ministry of Fisheries is empowered to set such conversion factors by *Gazette* notice after consultation with such bodies or persons as the Chief Executive considers appropriate, including Mäori, environmental, commercial and recreational interests.

4 In 1993 MFish, in consultation with stakeholders, reviewed the conversion factors applying to shark species. At that time there was no conversion factor to convert shark fin weight to shark greenweight. Advice resulting from the review was formulated through a stakeholder based Conversion Factor Standing Committee.

5 Data was available to assess a shark fin weight conversion factor for rig, school shark and spiny dogfish. The ratio of product to greenweight varied between the three species, from 27.00 to 33.00. The Conversion Factor Steering Committee agreed that an average shark fin conversion factor should be established for all shark species based on this data. An average shark fin conversion factor of 30.00 was agreed and, following the approval of the Minister of Fisheries, this took effect from 1 October 1993 upon notification in the *Gazette*.

6 Since that time the domestic tuna longline fishery has expanded and the bycatch of pelagic sharks has increased as a result. The prevalence of landing only the fins of some shark species has also increased. During stakeholder consultation on the introduction of pelagic shark species into the Quota Management System (QMS) some stakeholders referred to the potential inaccuracies in current conversion factors for larger shark species.

7 Recent analysis of information available to determine catch limits for pelagic sharks on entry to the QMS on 1 October 2004 again drew attention to the potential that reported landings of porbeagle, mako and blue sharks have been under-estimated because the current conversion factor is not applicable to larger sharks. Arbitrary corrections to reported catch data were proposed in order to develop proposals for catch limits to apply once these species enter the QMS.

8 Accurate information on landings is a first step in assessing the sustainability of any fishery. Currently the reporting of pelagic shark landings is subject to a number of errors either systematic or otherwise. This is particularly the case for species such as blue shark for which landings are almost entirely made up of processed fins. For example when only fins are landed there is the potential for incorrect species reporting.

9 A further complexity is that conversion factors for shark fins vary markedly in accuracy depending on how the shark fins are cut and how dry the shark fins are on landing. Accurate landed catch statistics may only be possible when complete trunks are landed and processed (accepting that a conversion factor will still be required for this processed state).

10 One of the benefits of introducing pelagic shark species into the QMS lies in the strong incentives that are created to reduce the practise of landing only the fins of sharks that are captured. This practise is widely regarded internationally as being wasteful and is prohibited in many countries.

11 Until such time as a change in fishery practise occurs as anticipated (or alternative measures are implemented) revised conversion factors are required for pelagic shark species to convert shark fin weight to shark greenweight.

Problem Definition

12 Accurate landing statistics are critical to the long-term assessment of sustainability of shark fisheries. The current factor to convert shark fin weight to shark greenweight leads to underestimates of greenweight catch for some species of sharks. Once pelagic shark species are introduced into the QMS the best available conversion factors will be required to ensure accurate catch reporting in these shark fisheries in order to monitor stock status and to balance catch against annual catch entitlement.

Options

Non regulatory

13 Not applicable

Regulatory

14 There is only limited data available to consider alternative conversion factors for mako, blue and porbeagle sharks. No observer data is available from recent years for these species. However the results of a set of mako shark data collected at shark fishing competitions during the summer of 2003 is available (Annex I). The data

gives the weight of fins that are removed for the shark fin trade (they don't include the upper lobe of the tail, or the small second dorsal and anal fins, which is consistent with commercial practice).

15 The weight of fins relative to body weight varies somewhat with shark size (in larger sharks the fin weight is a higher percentage of total weight), but the overall mean (1.68%) implies a conversion factor of 59.00. This is nearly double the rate of the current conversion factor of 30.00 that is applied generically to all shark species.

16 The World Conservation Union Shark Specialist Group (IUCN/SSC) reports on conversion factors for shark fin to shark body weight. The primary source of information cited is Atlantic shark stocks. This information is also incorporated in a recent review of shark finning in Australian waters[1].

Table 1: Conversion factors for shark fin to shark body weight

Species	Ratio of total fin weight to total body weight	Conversion factor
Blue shark	2.06	48.00
Mako shark	1.68	59.00
Porbeagle shark	2.19	45.00

***Source: IUCN/SSC Shark Specialist Group report intituled.**

17 The above conversion factors are based on the fins being landed wet and not after drying has occurred. It should be noted that, in order to improve price, shark fins are commonly dried.

18 The conversion factor for mako sharks derived from Atlantic stocks matches that from recreational competition data and anecdote from fishers that the current conversion factor should be doubled for pelagic sharks. This lends support to the use of the conversion factor data for porbeagle and blue sharks from Atlantic stocks, in the absence of information from New Zealand fisheries waters.

19 MFish considers that the limited information from overseas fisheries is the best available for application to New Zealand fisheries for these species when compared to the current position of a standardised conversion factor for all shark species.

20 The landed state of shark fins can make a considerable difference to their weight. The conversion factors identified above apply to wet fins, dried fins are lighter and represent a lower proportion of the greenweight. Current information suggests that if dry fins are landed the difference in conversion factor could be more than twofold.

21 Information is available to compare wet and dry weight ratios for mako shark. The ratio of wet fin weight to greenweight is 1.68 and the ratio of dried fin weight to greenweight is 0.70. Similar information is not available for porbeagle and blue shark. The difference between ratios is extreme suggesting a conversion factor of 142 should apply to mako shark if fins are dried. That is 100kg of mako shark fins could convert to either 5.9 tonnes (if fins are wet) or 14.2 tonnes (if fins are dry). Obviously the landed state of the fins themselves is potentially a significant source of

[1] The *Review of Shark Finning in Australian Fisheries* (*Final Report to Fisheries Resources Research Fund, November 2001*)' by Cassandra Rose and Kevin McLoughlin (Bureau of Rural Sciences, Agriculture, Fisheries and Forestry – Australia)

data error and more importantly a problem in balancing catch and annual catch entitlement.

22 MFish therefore proposes that separate conversion factors apply depending on the landed state of mako, porbeagle and blue shark fins. In the absence of species-specific information it is proposed that the conversion factor for dried fins is 2.4 times that proposed for wet fins.

Table 2: Proposed conversion factors for shark fins

Species	Ratio of total fin weight (wet) to total body weight	Conversion factor (wet weight)	Ratio of total fin weight (dry) to total body weight	Conversion factor (dry weight)
Blue shark	2.06	48.00	*	115
Mako shark	1.68	59.00	0.70	142
Porbeagle shark	2.19	45.00	*	108

23 There will be a requirement to amend both the Fisheries (Reporting) Regulations 2001 and the Fisheries (Conversions Factors) Notice 2000 to define new landed states and codes. The following definitions and codes are proposed:

- "Dried Fins" (FID) in the case of blue, mako and porbeagle shark means the state in which the head, body and all internal organs, other than the pectoral fins, dorsal fin and the lower lobe of the caudal fin have been discarded and the pectoral fins, dorsal fin and the lower lobe of the caudal fin have been rendered into a dried form; and

- "Wet Fins" (FIW) in the case of blue, mako and porbeagle shark means the state in which the head, body and all internal organs, other than the pectoral fins, dorsal fin and the lower lobe of the caudal fin have been discarded, prior to any drying or other processing of the pectoral fins, dorsal fin and the lower lobe of the caudal fin.

24 In circumstances where the fisher opts to land a shark in, say, a dressed "principal" state, but also lands a wet or dried fin as an "additional" landed state, it will be necessary to establish a landed state code. An additional landed state of "shark fins" (SHF) is currently specified in the Fisheries (Reporting) Regulations 2001, although this does not differentiate fins landed in the wet and dried states. MFish therefore proposes the following definitions and landed state codes:

- "Wet shark fins by-product" (WSB), in the case of fish landed in more than one state, means in relation to blue, mako and porbeagle sharks, the state in which the pectoral fins, dorsal fins and caudal (tail) fins have been landed prior to any drying or other processing; and

- "Dried shark fins by-product" (DSB), in the case of fish landed in more than one state, means in relation to blue, mako and porbeagle sharks, the state in which the pectoral fins have been landed prior to any drying or other processing.

Preliminary Consultation

25 The proposal to amend conversion factors for pelagic sharks was signalled in consultation material proposing catches limits for these species when they are introduced into the QMS on 1 October 2004. Te Ohu Kai Moana and the Seafood Industry Council supported the proposal in submissions.

Conclusion

26 Based on information from international fisheries and the limited data from New Zealand fisheries, MFish considers that use of the current factor to convert shark fin weight to shark greenweight (30.00) is leading to significant underestimation of greenweight catch for pelagic shark species. Although the available data is not extensive, MFish considers it appropriate to revise the conversion factor for shark fins as the principal landed state for mako shark, porbeagle shark and blue shark, the change to the conversion factors to take effect from 1 October 2004 to coincide with the proposed introduction of these species into the QMS. MFish will also propose the collection of further information to review and update conversion factors for sharks over time.

27 Although information on conversion factors for shark fins is only available on mako shark in New Zealand waters, international data (although potentially from separate stocks of the same species) is available and MFish considers that it is the best available information when compared to the current shark fin conversion factor. A significant potential source of error in conversion of shark fin weight to shark greenweight is the landed state of the shark fins (whether they are dry or wet). New codes conversion factors and landed state definitions are required to address these.

Initial Proposal

28 MFish proposes that:

a) The Fisheries (Reporting) Regulations 2001 and the Fisheries (Conversions Factors) Notice 2000 are amended to specify landed state codes and define define new landed states respectively as follows:

- "Dried Fins" (FID) in the case of blue, mako and porbeagle shark means the state in which the head, body and all internal organs, other than the pectoral fins, dorsal fin and the lower lobe of the caudal fin have been discarded and the pectoral fins, dorsal fin and the lower lobe of the caudal fin have been rendered into a dried form;

- "Wet Fins" (FIW) in the case of blue, mako and porbeagle shark means the state in which the head, body and all internal organs, other than the pectoral fins, dorsal fin and the lower lobe of the caudal fin have been discarded, prior to any drying or other processing of the pectoral fins, dorsal fin and the lower lobe of the caudal fin;

- "Wet shark fins by-product" (WSB), in the case of fish landed in more than one state, means in relation to blue, mako and porbeagle sharks,

the state in which the pectoral fins, dorsal fins and caudal (tail) fins have been landed prior to any drying or other processing; and

- "Dried shark fins by-product" (DSB), in the case of fish landed in more than one state, means in relation to blue, mako and porbeagle sharks, the state in which the pectoral fins have been landed prior to any drying or other processing.

b) The conversion factor for wet shark fin weight to shark greenweight (FIW conversion factor) for blue shark (*Prionace glauca*) is set at 48.00

c) The conversion factor for dry shark fin weight to shark greenweight (FID conversion factor) for blue shark (*Prionace glauca*) is set at 115.00

d) The conversion factor for wet shark fin weight to shark greenweight (FIW conversion factor) for mako shark (*Isurus oxyrinchus*) is set at 59.00

e) The conversion factor for dry shark fin weight to shark greenweight (FID conversion factor) for mako shark (*Isurus oxyrinchus*) is set at 142.00

f) The conversion factor for wet shark fin weight to shark greenweight (FIW conversion factor) for porbeagle shark (*Lamna* nasus) is set at 45.00

g) The conversion factor for dry shark fin weight to shark greenweight (FID conversion factor) for porbeagle shark (*Lamna* nasus) is set at 108.00

ANNEX ONE

Shortfin mako (Isurus oxyrinchus) fin: weight relationship

Clinton Duffy (unpublished data)

Sample size: 23
Mean total fin weight as % of body weight: 1.68 ± se 0.08 (s.d. 0.38)