

Setting of Sustainability and Other Management Controls for  
Stocks to be Introduced into the QMS on 1 October 2003

**Kingfish**

**Initial Position Paper**

14 May 2003



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# STATUTORY OBLIGATIONS AND POLICY GUIDELINES

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## Purpose of the Fisheries Act 1996

- 1 The purpose statement of the Fisheries Act 1996 describes the overriding objective of the Act as being to provide for the utilisation of fisheries resources while ensuring sustainability. The 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 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 well-being. Within the parameters of the 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 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 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 (TAC)

- 5 Below the level of the purpose statement, the 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 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 providing for utilisation while ensuring sustainability, but each option provides for a fundamentally different management outcome. The TAC determines the level of catch within which people can provide for their own well-being. There is no legal requirement that the TAC must ensure any particular measure of well-being is achieved.

### **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 maximum sustainable yield (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 biomass target ( $B_{MSY}$ ), 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 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 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 (ITQ), 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 Total Allowable Commercial Catch (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 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 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 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, e.g., 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 (e.g., 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 fishing 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 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 Act would be better achieved by setting a TAC other than in accordance with s 13 of the Act (ie, at or above MSY). Maintaining a stock above the level that ensures its long-term viability is consistent with the purpose of the 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 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  $B_{MSY}$ .



- 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 viability 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 its 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 proposals to introduce kingfish into the QMS on 1 October 2003.

### ***Other Statutory Obligations Applicable When Setting a TAC***

- 30 When setting a TAC, a number of generic provisions of the 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 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 Act.

### *Environmental Principles*

- 32 The 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 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 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 resources 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 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 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, and hence are of special significance, should be protected. Adverse effects on such areas are to be avoided, remedied, or mitigated.
- 37 Insufficient information is available to undertake a systematic assessment of biodiversity matters associated with the introduction of kingfish into the QMS on 1 October 2003. No ecosystem, population, assemblage assessment has been undertaken. However, an assessment of the relative information available and the degree of risk in relation to the environmental principles are outlined in this document.

#### *International Obligations (s 5(a))*

- 38 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 the Ministry of Fisheries’ (MFish) view that the provisions of the Act, and the proposed exercise of powers under the legislation are consistent with New Zealand’s international obligations.
- 39 The 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 Act or the exercise of discretion, the decision maker must choose the option that is consistent with New Zealand international obligations relating to fishing (s 5(a) of the Act).
- 40 MFish is involved in a number of initiatives relating to the management of stocks within the EEZ 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))*

- 41 The 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, Māori non-commercial fishing rights continue to give rise to Treaty obligations on the Crown.

- 42 This document sets out information relating to the customary interest in kingfish. An allowance for customary fishing has been made on the basis of a qualitative assessment of that interest. The consultation process will provide Māori with an opportunity to comment on the customary use and management of kingfish. However, no explicit consideration has been given to the application of the specific customary management tools available under the Act. 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.
- 43 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 kingfish stocks on introduction into the QMS.

*Additional Factors to be taken into Account (s 11)*

- 44 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.
- 45 Where any of the above factors are relevant, they are discussed in the species-specific section. MFish is not aware of any specific plans, statements or strategies that are relevant to kingfish. No fisheries plans have been approved to date. 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.
- 46 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 kingfish stocks into 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.

## **Guidelines for Setting TACs for New Species**

47 There are a number of closely interrelated factors that need to be taken into account when setting the TAC. The following factors are identified as being of particular significance:

- Identifying the appropriate TAC option for a stock (ss 13, 14, 14B): The level at which the TAC is set will be heavily influenced by the statutory TAC option proposed for the stock. Existing estimates of yield based upon on MSY or an existing catch limit for a stock might not be applicable for a stock managed under ss 14 or 14B.
- The biological and fishery characteristics of the stock and associated stocks: The biological and fishery characteristics of the stock may influence the TAC option adopted for the stock. The biological characteristics, including natural variability, may influence an assessment of the extent of any initial development opportunity. Implications for interdependent stocks should be expressly considered in particular bycatch and target relationships. In some instances information about current catch levels may not accurately reflect actual catch ratios in multi-species fisheries due to the nature of the reporting obligations for non-QMS stocks.
- The effects of harvesting the stock on the aquatic environment: The relative effects on the environment of different TAC options should be considered. Interactions with protected species and areas of high biodiversity need to be actively managed. Consideration of predator-prey relationships is an important factor. The effects of different fishing methods should be considered.
- Maximisation of utility: “Utility” is a measure of the social, cultural and economic value that flows from the target level adopted for a stock. The objective of maximising utility reflects the goal of the MFish strategic plan to obtain best value from fisheries management and can be related back to the objective in the Act to “enable people to provide for their social, economic, and cultural well-being”. Utility may sometimes be a relevant consideration when setting the TAC. For example, management above  $B_{MSY}$  will typically result in a greater level of biomass, a greater range of size classes, and lower levels of available yield on an annual basis. Accordingly, management above  $B_{MSY}$  in most cases, would bring greater value to recreational fishers than commercial fishers (although there may be advantages to commercial fishers being able to maintain higher catch rates from a stock that is above  $B_{MSY}$ ). Conversely a target level below  $B_{MSY}$  may bring greater value to commercial fishers (at least in the short term). A more in-depth discussion of utility is contained in this paper in the section on “Allocation of TAC”.
- The capacity for development of the stock: The Act requires that consideration be given to the development of fisheries resources while ensuring the sustainability of those resources. In the purpose statement of the Act (s 8), the definition of the word “utilisation” includes “developing” fisheries resources to enable people to provide for their well-being. The QMS provides the most appropriate mechanism for development to occur. Development can be actively provided under the various TAC options. Rotationally harvested and enhanced fisheries provide scope for a TAC to be set at a level other than one that moves the stock towards

$B_{MSY}$ . A stock managed below  $B_{MSY}$  may provide for additional catch to be taken. In some instances stocks introduced to the QMS have been lightly fished and are deemed to be in a near virgin state; hence the stock is well above  $B_{MSY}$ . While there is no provision in the Act for TACs to be set at a nominal level, there is scope for additional catch to be taken in the short term as the stock is fished towards a level that can produce MSY.

- Important factors when considering development potential are that:
  - i) setting TACs at the level of current catch (in some instances a zero or one tonne TAC) may artificially constrain development of a stock where there is virtually no risk posed to the stock by setting a higher TAC;
  - ii) existing catch limits (competitive or ICE) may not be appropriate for the purposes of setting a TAC/TACC. This is because they were originally designed to allow limited target fishing on a competitive basis for those fishers with existing permits. The competitive catch limits may not be reflective of actual total landings for the species concerned.
  - iii) development may be constrained by a lack of a scientific review of a stock in the immediate future once introduced to the QMS due to competing priorities for review of other stocks;
  - iv) a TAC may be set at a level that moves the stock over time towards a level that can produce the MSY ( $B_{MSY}$ );
  - v) if a TAC is set at a level in order to move a stock towards  $B_{MSY}$ , information (catch and effort data or fishery independent research) needs to be forthcoming to assess when the stock is at or above the level that can produce the MSY;
  - vi) setting a TAC that provides for some level of initial development offers an incentive for fishers to invest in the fishery and develop initiatives such as adaptive management proposals and fisheries plans.
- The information principles: The Act specifies that 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 Act. As noted above, the purpose of the Act contains two distinct elements “ensuring sustainability” and “providing for utilisation”. In the absence of an explicit hierarchy between the two objectives, a decision is to be made on a case by case basis that takes into account the available information to determine the relative weight given to each of the objectives. Any decision should explicitly identify the factors taken into account and the relative weighting placed upon the relevant information. An assessment of that weighting should be guided by the principle that “decision makers should be cautious when information is uncertain, unreliable, or inadequate” (s 10(c)).
- Existing stock assessment information about the status of the stock: Information about current biomass and estimate of available yield may be available for only a limited number of stocks. An explicit CAY or MCY (or equivalent) management approach, complementary with the characteristics of the stock, may be adopted

with the reasons stated for that approach. The certainty, reliability, and adequacy of that information needs to be taken into account. Existing estimates of yield might not be applicable for a stock managed under ss 14 or 14A.

- **Current catch levels of the stock:** In the absence of robust assessment information or an existing catch limit (competitive or ICE) current catch can be used as a basis for setting the TAC, subject to consideration of other relevant statutory obligations. The reliability of any information is to be taken into account.
- **Monitoring of stock:** Current and future monitoring of the stock is an important factor relating to an assessment of risk to sustainability. The ability to assess the stock, the nature of the assessment method and the likely robustness of that assessment, the level of observer coverage, and the nature of direct research are to be considered in the assessment of different potential TAC options.
- **Relevant social, economic, and cultural factors:** The ability to set a TAC at different levels will have commensurate social, economic, and cultural implications. The way and rate at which a stock is fished towards  $B_{MSY}$  should explicitly take into account relevant social, economic, and cultural factors. The interests of future generations is an important social consideration that is reflected in consideration of the TAC option adopted (i.e. ss 13, 14 or 14B) and the level at which the TAC is set. Treaty obligations arising in respect of a stock are encompassed within relevant cultural factors.

### ***Development opportunity***

- 48 MFish acknowledges that information on which to base catch limits in a number of non-QMS fisheries is deficient. However, in accordance with the use of the information principles, as discussed above, MFish believes that there is opportunity in a number of fisheries on introduction to the QMS to place greater weight on utilisation opportunity in the absence of any discernable risk to the stock or the aquatic environment when considering TACs.
- 49 Catch in a number of the fisheries proposed for introduction is not reflective of abundance, but rather has been influenced by the inability to obtain access to the fishery (as a result of the permit moratorium) and marketing/processing issues. In some cases there is also likely to be significant levels of underreporting, particularly in bycatch species. Introduction into the QMS will potentially provide more access opportunities and a better framework for managing the stock, given the reporting and catch balancing requirements on fishers.
- 50 The opportunity for development and 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, if the stock has been lightly fished therefore biomass is likely to be close to virgin or at least above  $B_{MSY}$ ;

- Likely impacts of fishing on aquatic environment, including bycatch species etc;
- Socio-economic and cultural issues; and
- Anecdotal information on abundance, including consideration of the size of likely habitat in the management area.

- 51 In bycatch fisheries, in particular, interaction with other harvested stocks should be a consideration in any TAC proposed. In the absence of sustainability concerns fishers in bycatch fisheries will face punitive measures under the balancing regime if the TACs are not set appropriately.
- 52 While the initial TACs proposed are likely to provide some opportunity for development of the fishery by existing and/or new entrants, they might not provide the maximum utilisation possible for the stock. Further increases will require, in most cases, additional supporting information on the impacts of fishing on the stock and aquatic environment. These matters are best incorporated within stakeholder driven initiatives following introduction.
- 53 As a consequence of providing development opportunity above existing levels of utilisation, the TAC may not be fully caught immediately following introduction pending the development of harvesting/marketing/processing capacity. However, this in itself is not a reason not to provide opportunity for development when potential risk to the stock based on the factors noted above is considered acceptable.

### ***Use of information***

- 54 The nature of the information available about each stock is likely to vary. A hierarchy (set out below) is proposed in respect of the nature of the information and hence the weighting to be assigned to that information. As a general rule greater weight will be placed on information at a higher level on the hierarchy. Stock assessment information is afforded greater weight than a non-QMS catch limit set for the stock. A catch limit or commercial catch limit may be afforded greater weight than information about historical and current catch levels.
- 55 However, careful consideration is required in assessing the nature of any current catch limit. In some instances competitive catch limits may not be reflective of actual total landings for the stocks concerned. Competitive catch limits may have also acted to constrain effort in a fishery in support of the permit moratorium (ie to limit new entrants), rather than as a measure explicitly designed to ensure sustainability of the stock. They were originally designed to allow limited target fishing on a competitive basis for those fishers with existing permits.

1.	Information about status of stock and estimates of available yield	Adopted in Plenary Report	Use as basis for setting TAC (subject to consideration of guidelines identified above – ie, general statutory obligations and TAC option, etc)
		Not adopted in Plenary Report	Take information into account, but receive limited weighting



2.	Existing catch limit set (CL/CCL – competitive or ICE)	CL or CCL and catch information of fishing sectors and other sources of mortality	Use as basis for setting TAC (subject to consideration of guidelines identified above, including validity of CL/CCL)
		Sustainability concern (in context of TAC option adopted)	Review and/or reduce existing catch limit when set TAC

3.	Catch information and estimates of other sources of mortality	Apply criteria (identified below) for calculating catch information	Use as basis for setting TAC (subject to consideration of guidelines identified above)
		Sustainability concern (in context of TAC option adopted)	Review and/or reduce overall catch when set TAC

56 The term “sustainability concern” is used to describe a situation where, after considering all relevant issues, there is a conclusion that the existing non-QMS catch limit or current catch is not sustainable and should not be used as a basis for setting a TAC. The term “sustainability” is intended to encompass issues relating to the stock itself and the effects of fishing on the aquatic environment (ie, impacts of fishing method, trophic relationships, target/bycatch stock complexes).

57 A significant increase in catch levels of a stock in recent years may not necessarily equate to increased abundance, but rather might be an indication of increased effort and targeting of the stock. Consideration of relevant information may result in a TAC being set that is more precautionary than the current catch level.

### ***Criteria for Determining Catch Levels***

58 Criteria have been developed for determining catch levels and other sources of mortality. In the absence of other information TACs may be set at levels based on consideration of known or estimated levels of recreational, Māori customary, and commercial catch and all other sources of fishing related mortality. The purpose of the exercise is to calculate the overall level of catch being taken from the fishery. The information about the catch of each sector group may act as a guide to the subsequent allocation of the TAC but, in itself, that will not be determinative of that exercise. The Minister makes a separate decision about allocation after setting the TAC.

59 The criteria is as follows:

Commercial Catch	Current catch	Current commercial catch from the fishery
	Stable fishery	Average catch for a period since 1986 where catch level has been relatively stable for in excess of 3 years
	Developing fishery	Average catch over last 3 completed fishing years where a significant increase in catch has occurred
Recreational Catch	Existing estimates (diary surveys, etc)	Use as basis for determining current recreational catch
	No estimates but known recreational catch	Nominal catch level included
	No known recreational catch	No catch level included
Customary Catch (note: criteria qualified by individual circumstances applicable to a particular fishery)	Existing estimates (customary permits/authorisations; information provided by tangata whenua etc)	Use as basis for determining current customary catch
	No estimates but known to be of significant importance to Māori above the level of recreational take	Catch level above the known recreational catch included
	No estimates but known to be of importance to Māori	Catch level similar to known recreational catch included
	No estimates but known customary catch (and stock of no particular importance to Māori)	Catch level half of known recreational catch included
	No known customary catch	No catch level included
Other Sources of Mortality to the Stock Caused by Fishing	Quantitative information or estimates of illegal catch, discards, incidental gear mortality available	Use as basis for determining current level of other sources of mortality
	No estimates but other sources of mortality known to occur based on information about similar stocks and methods	Nominal mortality level included
	No known mortality	No mortality level included

60 In the absence of an estimate of sustainable yield from the fishery, or the presence of a robust and reliable CL or CCL, an assessment of commercial catch based on the criteria of “stable” or “developing” has been undertaken. The criteria of “stable” and “developing” fisheries for estimating commercial catch were adopted in 1998 for the introduction of species into the QMS for 1 October 1998. A fishery is “stable” when reported catches have remained relatively constant over an extended period of time

(ie, in excess of three years). Included in the category of a “stable” fishery are those stocks where the catch level has fluctuated over time. In most fisheries such fluctuation is anticipated as a natural biological occurrence. For “stable” fisheries commercial catch has been calculated using the average catch for a period since 1986 where the catch level has been relatively stable in excess of 3 years.

- 61 A fishery is “developing” where a substantial increase in catch has been recorded over the last three completed fishing years. Where this has occurred the average total landings over the last three completed fishing years have been used as a basis for determining current commercial catch.
- 62 Calculation of commercial catch based on the criteria of “stable” or “developing” is one factor to be considered when setting a TAC. As indicated above, there may be the potential to provide some opportunity for development of a stock above existing catch levels.

### ***Analysis of TAC Options***

- 63 An analysis of different potential TAC options is undertaken in respect of each stock where there are viable alternatives. Where more than one statutory TAC option is available (ie, ss 13, 14 or 14A) an assessment of relevant information is provided. An important consideration is the respective trade-offs between different TAC options in terms of potential economic return, information levels – current and future, and sustainability concerns (stock specific and general environmental). The purpose is to indicate the relative weighting assigned to different factors for each TAC option. In most instances only a relatively subjective qualitative assessment can be undertaken.

### **Allocation of TAC**

- 64 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 Māori;
  - b) recreational fishers;
  - c) all other sources of mortality to the stock caused by fishing; and
  - d) the TACC
- 65 In the absence of other information TACs may be set at levels based on consideration of known or estimated levels of recreational, Māori 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***

- 66 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.

- 67 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.
- 68 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.
- 69 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.
- 70 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.
- 71 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)).

- 72 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.
- 73 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.
- 74 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.
- 75 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.
- 76 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.

- 77 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).
- 78 Certain fisheries are considered to be of particular importance to certain fishers. In considering the extent of the recreational and Māori 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.
- 79 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.
- 80 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)).
- 81 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.

- 82 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.
- 83 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).
- 84 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 Minister's TAC/allocative decisions.
- 85 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.
- 86 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.
- 87 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.

- 88 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 any 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.
- 89 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.
- 90 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.
- 91 Reference to cultural factors in s 13(3) can be interpreted as encompassing both those provisions of the Act relating to the interests of Māori 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***

- 92 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*

- 93 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*

- 94 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.
- 95 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.
- 96 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.
- 97 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.

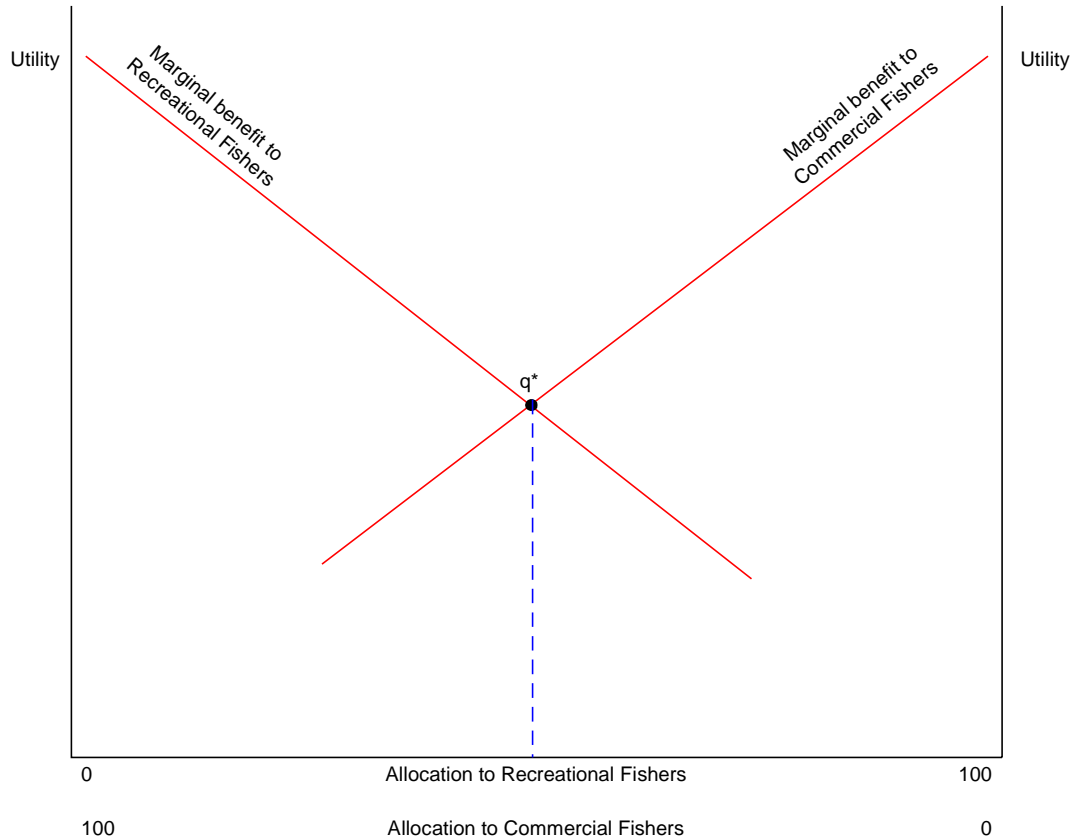


Figure 1: Determining the allocation between commercial and recreational fishers

- 98 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.)
- 99 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).
- 100 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.

- 101 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.
- 102 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.
- 103 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.
- 104 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.
- 105 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.

- 106 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.
- 107 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*

- 108 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.
- 109 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.

## **Other Management Controls**

- 110 The TAC is invariably supported by a number of management controls that collectively ensure the sustainability of the stock and provide for utilisation within accepted limits. The Act explicitly provides for the setting of sustainability measures relating to size limits, biological state, fishing seasons, methods restrictions, closed areas, plus measures such as overfishing thresholds and bag limits.
- 111 The following section sets out those measures that currently apply which are proposed for being retained as part of the management framework for kingfish under the QMS. The general intent is not to undertake a widescale review of all existing measures or potential measures that could be adopted. The ideal opportunity to discuss such issues will arise when quota is taken up by fishers and potentially within the context of development of a fisheries plan. However, where necessary, consideration of appropriate measures, such as method restrictions, is outlined.

## **Setting of Deemed Values and Overfishing Thresholds**

- 112 A section in this document sets out the interim and annual deemed values proposed for kingfish.
- 113 The section also contains information about the setting of overfishing thresholds and tolerance levels for kingfish.

## **Cost Recovery**

- 114 The Act provides a framework where certain costs of the Crown in delivering fisheries services or conservation services may be recovered from the commercial fishing industry. In summary these costs arise from research activities, administration of the QMS, enforcement activities delivered by (or through) MFish or in respect of conservation services delivered by the Department of Conservation. The services to be delivered in each of these areas is subject to annual consultation with stakeholders.
- 115 Having determined that some of the Crown's costs can be recovered the allocation of these costs is determined by the Fisheries (Cost Recovery) Rules 2001. In general the costs of research are targeted towards the fishery (or group of fisheries) to which specific research programmes relate. The costs of QMS administration and enforcement are generally targeted to quota holders. Therefore, upon introduction into the QMS, commercial quota owners will face some proportionate costs in these areas.
- 116 In a more general sense, cost recovery is a key fisheries management tool. The intent of commercial fishers meeting the full costs associated with access and property rights is to encourage rational business decisions that provide for the good husbandry of the resource. Following introduction to the QMS, fishers will have the opportunity to

consider future management options including potential trade-offs that may be available between further research (with associated costs) and increased catch levels.

# KINGFISH (KIN)

## Executive Summary

- 1 The kingfish fishery is gazetted for introduction into the QMS on 1 October 2003.
- 2 MFish notes that this fishery is highly valued by recreational fishers. Most current commercial catch is taken as a bycatch. An assessment of utility (social, cultural and economic well being) suggests that greater benefit could be obtained by improving recreational opportunity in the fishery.
- 3 In accordance with improving recreational fishing opportunity MFish proposes that kingfish be managed at a biomass above that which would support the Maximum Sustainable Yield ( $B_{MSY}$ ). In order to provide the greatest opportunity of moving toward the proposed target level, MFish proposes a reduction to the level of average landings when setting the TAC.
- 4 There are two options for allocating the reduced TACs in KIN 1 and KIN 2:
  - one option is based on a proportional reduction to removals for both commercial and recreational sector,
  - the other option involves some reallocation of catch from the commercial sector to the recreational sector on the basis of utility. MFish does not have a preference for either option.

**Table 1: Options for TACs allowances and TACCs for kingfish stocks:**

Stock	TAC	Customary allowance	Recreational allowance	Recreational fishing-related incidental mortality	TACC	Commercial fishing-related incidental mortality
<b>KIN 1</b>						
Average landings	885	76	600	24	156	29
Proportional	708	76	460	31	119	22
Reallocation	708	76	504	33	80	15
<b>KIN 2</b>						
Average landings	228	18	85	3	93	29
Proportional	182	18	66	4	72	22
Reallocation	182	18	92	6	50	16
<b>KIN 3</b>	3	1	1	-	1	-
<b>KIN 7</b>	21	2	10	1	7	1
<b>KIN 8</b>						
Average landings	108	9	40	2	50	7
Proportional	86	9	31	2	39	5
<b>KIN 10</b>	1	0	0	0	1	-

- 5 There are a number of options for management of recreational and commercial catch within allowances:
  - MFish proposes to increase the minimum legal size (MLS) for recreational fishers from 65 cm to 75 cm in order to constrain recreational catch to within the proposed allowances.

- 6 The options for the TACC noted above are based on an MLS of 65 cm. Commercial fishers are required to return fish below the MLS to the water. MFish assesses that this MLS contributes the majority of the commercial portion of fishing related incidental mortality in the fishery. A series of options are discussed:
- Retain the current 65 cm MLS. This option would result in commercial fishers having a different (lower) size limit than recreational fishers (if the increase to the recreational MLS proceeds). This option would result in 29 tonnes of other sources of mortality that is effectively lost utilisation.
  - Alternatively, the commercial MLS could be increased from 65 cm to 75 cm. The impact of this measure would be to increase the other sources of mortality substantially (from 29 tonnes to 40 tonnes in both KIN 1 and KIN 2, from one tonne to two tonnes in KIN 7, and from four tonnes to 13 tonnes in KIN 8). MFish considers that this level of mortality is unreasonably high when compared to the overall TACC proposed.
  - A second option is to remove the MLS for commercial fishers. This would require commercial fishers to land all catch and would effectively reduce the other sources of mortality attributed to commercial fishing to zero. This would make part of the allowance for other sources of mortality available to other fishers to utilise. However, the requirement to land all catch taken would substantially increase the number of kingfish commercial fishers would be required to land. The likely impact of this measure would be the requirement for fishers to alter their fishing practices in order to avoid the catch of kingfish when targeting other species. It is unclear the extent to which any alteration would reduce the amount of bycatch taken. If it is assumed that TACCs would constrain landings and it was not possible for fishers to alter their practices, then the socio-economic impacts of this option would be significant.
- 7 To mitigate the socio-economic impacts noted above, and to reduce the other sources of mortality, kingfish taken by the methods of trawl, longline and purse seine could be returned to the water by placing kingfish on the Sixth Schedule of the Act. This would reduce the socio-economic impact of constraining TACCs and provide fishers with some flexibility to control catch. However, MFish assesses that ensuring compliance with the Sixth Schedule provisions (that fish are likely to survive release) in order to prevent discarding of fish in contravention of specified provisions is potentially a significant problem. This problem would be exacerbated where a high deemed value relative to port price is proposed (as is the case with kingfish). Therefore, while this option would provide sufficient flexibility to mitigate the majority of the socio-economic impacts of a constraining TACC, it would require a commitment from fishers to manage the more complex compliance issues that result, perhaps by means of a compliance code.
- 8 MFish's initial position is not to recommend the addition of kingfish to Schedule 5A. This will allow the carry-forward of up to 10% of the annual catch entitlement that a commercial fisher may hold from one year to the next.
- 9 The Fisheries (Reporting) Regulations 2001 that outline the codes to be used by commercial fishers when completing their statutory catch returns need to be updated to reflect the new QMS reporting codes.



## Introduction

10 Kingfish will be introduced into the QMS on 1 October 2003. The Quota Management Areas (QMAs) for the fishery have been determined, as illustrated in Figure 2. The fishing year for kingfish stocks will start on 1 October and end on 30 September in the following year. The TACC and annual catch entitlement (ACE) are to be expressed in terms of greenweight.

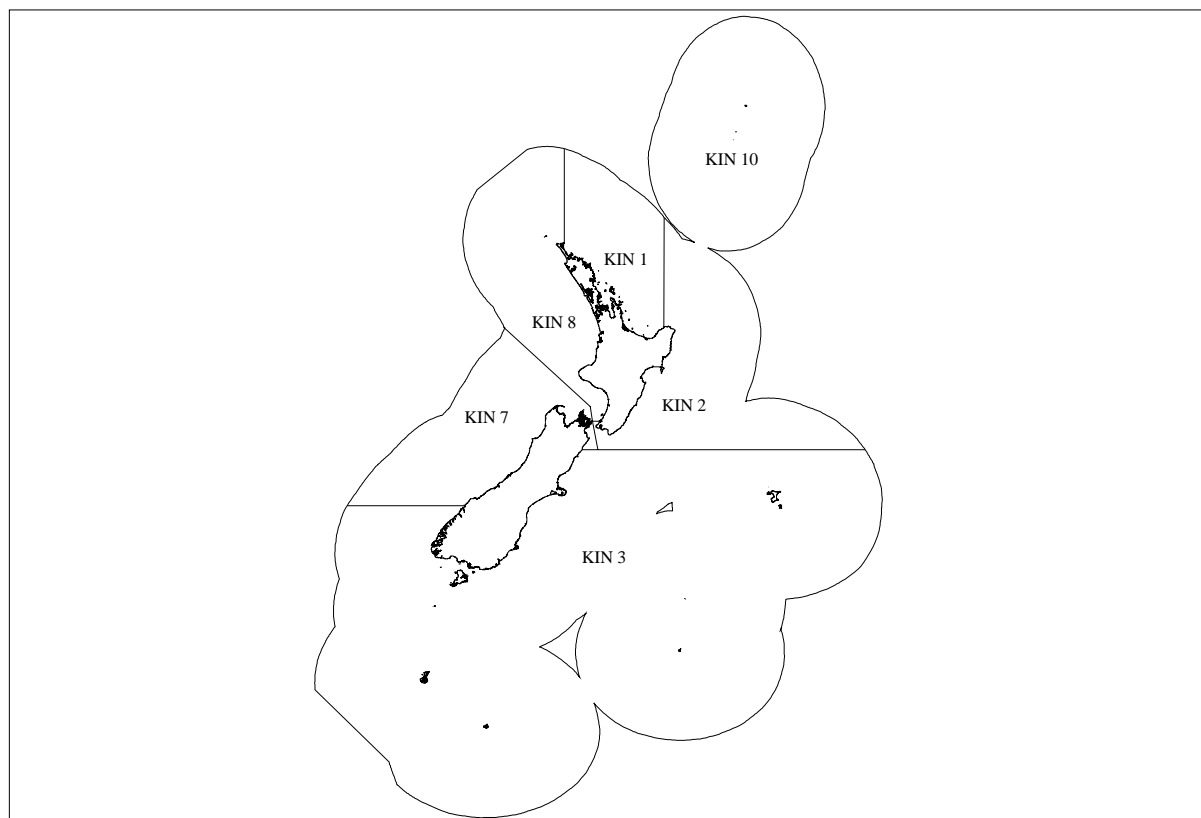


Figure 2: Kingfish Quota Management Areas (QMAs).

11 MFish considers that there are key decision steps in setting sustainability measures for kingfish stocks, as follows:

- consideration of target biomass levels;
- setting of the TAC;
- allocation of the TAC (Māori customary, recreational, TACC and other sources of incidental fishing mortality); and,
- determining tools for constraining catch to the allowances set.

### **Management context**

#### *Fishery Characterisation*

12 Background information on kingfish catch by sector and method is outlined in Annex One. However, in summary, kingfish is taken largely as a bycatch by commercial fishers. Total commercial landings reached a peak in the 1991-92 fishing year of 543

tonnes and have since declined to 222 tonnes in the 2001-02 fishing year. The majority of commercial landings is taken in QMA 1 (Northland, Hauraki Gulf, Bay of Plenty) and QMA 2 (East Cape to Cape Palliser). Commercial landings from these areas were 98 and 61 tonnes respectively in the 2001-02 fishing year. Landings in these areas have declined in line with total landings.

- 13 Recreational catch is considerably higher than commercial landings as estimated by recreational surveys. Most recent estimates from a 1999-2000 survey suggest that 800 tonnes of kingfish were taken from QMA 1.
- 14 It is important to make a distinction between landings and catches in the kingfish fishery. Since a MLS of 65 cm was established in October 1993 for most commercial methods, and in 2000 when trawling became subject to the MLS, commercial landings of kingfish have declined. However, substantial levels of fishing related incidental mortality is associated with the catching and releasing of fish caught under the MLS of 65 cm, and these incidental catches are not accounted for in landings data.
- 15 There is no stock assessment for kingfish and therefore no estimate of stock size relative to  $B_{MSY}$  or estimate of sustainable yield for the fishery. Anecdotal information from recreational fishers and the decline in commercial catch may suggest a decline in the abundance of kingfish.

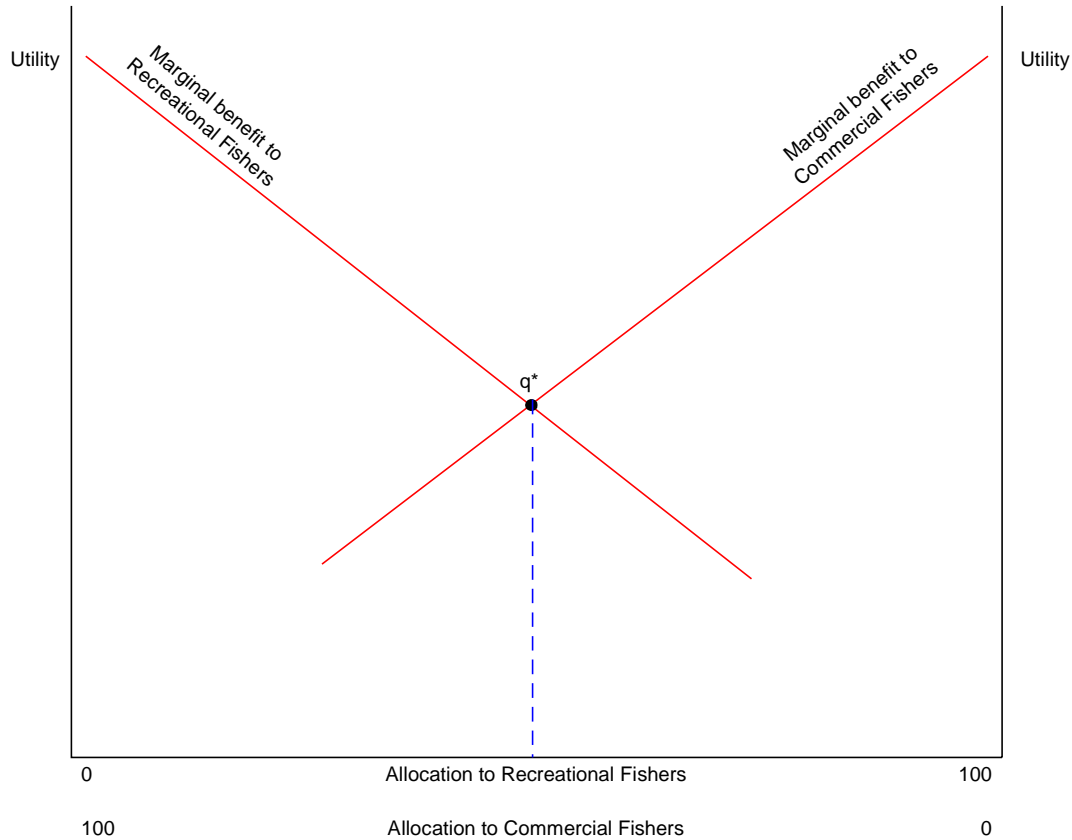
#### *Estimates of utility*

- 16 Kingfish are highly valued by recreational fishers. Kingfish are targeted by recreational fishers from private boats, and are a prized catch for spear fishers and land based game fishers. This species supports a charter boat fishery on a regional and seasonal basis. A survey of the Value of New Zealand Recreational Fishing undertaken by the South Australian Centre for Economic Studies (SACES) compared kingfish fishers with other recreational fishers. Kingfish anglers are characterised as follows: they regard fishing as a more important recreational activity; they go fishing marginally more times per year; they are more likely to fish for sport and eating purposes; are more likely to catch and keep additional fish; they are more likely to have difficulties in trying to catch their target fish; they spend a longer time fishing; they have higher average fishing trip expenditure; they have higher incomes; and they are more likely to be a member of a fishing club.
- 17 The results of the SACES survey produced estimates of the value of the recreational fishery for kingfish based on non-market estimation techniques (contingent valuation to determine the willingness of a fisher to pay to catch a kingfish). These results were used to estimate the value of the recreational kingfish fishery based on the 1996 estimate of recreational catch of 382 tonnes.
- 18 The results estimate: total recreational expenditure at \$128 million; value based on marginal willingness to pay of \$1.2 million; value based on average willingness to pay of \$11.4 million. These estimates have been used by some recreational submitters to compare recreational versus commercial fishery values and to argue that the kingfish fishery should be, in whole or at least in substantial part, a recreational fishery.

- 19 It is important to note that total expenditure (estimated at \$128 million) is not a measure of the net benefit of the fishery and cannot be directly compared to the port price value of kingfish taken commercially. Also of note is the fact that estimates of expenditure and value are based on what is likely to be an under-estimate of recreational landings.
- 20 MFish considers that the best comparative measure of recreational value is determined from the marginal willingness to pay (the change in willingness to pay with respect to a unit change in the amount of fish caught and kept). Using the estimates provided by SACES of a marginal willingness to pay of \$3,260 per tonne and capitalising this amount at rates of 5% and 10% provides a range of values from \$32,600 to \$65,200 per tonne.
- 21 Commercially caught kingfish is a relatively high value species sold as fillets, headed and gutted, or whole chilled. In recent years at least 30% of the commercial catch has been exported mainly to the United States, Europe and Australia. Export price was \$6.90 per kilogram greenweight during 2001-02. This price is comparable with that received for QMS species such as hāpuku (or groper) and John Dory. In order to determine possible future quota value of kingfish MFish has assessed two comparable QMS species, John Dory and hāpuku. While the fisheries differ in scale and characteristics, the export prices of these three species are similar. Like kingfish, John Dory is taken as a bycatch with total annual catches of around 850 tonnes. Hāpuku is both target and bycatch with annual landings of around 1500 tonnes. The average traded price for these species in 2001-02 was \$22,088 and \$15,162 respectively per tonne. These average prices suggest a commercial value for kingfish in the range of \$15,000-22,000 per tonne, which is approximately one half to one third of the estimated value of one tonne of kingfish caught by recreational fishers.

### ***Implications for management of kingfish***

- 22 Utility is a measure of the social, cultural and economic value that flows from harvest of a resource. The objective of maximising utility reflects the goal of MFish's strategic plan to obtain best value from fisheries management. If the decision maker wished to improve utility from a fishery they would make decisions that would enable those who value the fishery most to have a share of the harvest that enabled them to maximise their utility.



**Figure 3: Determining the allocation between commercial and recreational fishers**

- 23 Figure 3 illustrates the issue. A description of the graph is contained in the guidelines section to this paper (page 21, para 95). The intersection between the two curves represents the optimal allocation point where utility from the fishery is maximised.
- 24 The data noted previously indicates that recreational fishers place a greater value on the kingfish fishery than commercial fishers. Given the information on relative utility, it can be assumed that the current allocation of kingfish lies somewhere to the left of the optimal point. Accordingly, there may be some benefit (in terms of maximising utility) from increasing benefits to recreational fishers by increasing their allocation.
- 25 However, as noted in the guidelines section, there is considerable uncertainty in information used to assess utility in the absence of a market for tradable rights between sectors. This uncertainty relates to ability to compare non-market values (willingness to pay) with market values (price of quota) and the static nature of the value estimate. The estimate of value is valid only for the time the survey was undertaken. Since that time social, cultural and economic values may have changed. Further, there is no estimate currently available about the extent of reallocation that might be required.
- 26 The information noted above informs decision makers in respect of two key decisions in relation to kingfish: (i) setting the target biomass level; and, (ii) allocation between sectors.

## Total Allowable Catch (TAC)

27 MFish proposes two options for setting TACs for kingfish stocks as outlined below.

Table 2: Proposed TAC option for kingfish stocks:

QMA	1	2	3	7	8	10	Total
Option one	885	228	3	21	108	1	1 246
Option two	708	182	3	21	86	1	1 001

### Statutory TAC Options

28 Section 13 of the Act represents the default management option that is to be applied when setting a TAC for a QMS stock, unless the stock size is considered highly variable from year to year or it qualifies for management under the criteria outlined in s 14 or s 14A of the Act. MFish does not consider that kingfish stock sizes are highly variable from year to year. In order for a stock to be added to the Third Schedule under provisions of s 14, the biological characteristics of the species must prevent the estimation of  $B_{MSY}$ , the catch limit for any of the stock must form part of an international agreement, or the stock must be managed on a rotational or enhanced basis. Kingfish does not meet any of these criteria. Section 14A enables the Minister to set a TAC that maintains the stock at a level that ensures its long-term viability, while other inter-related stocks can be taken at TAC and TACC levels based on  $B_{MSY}$ . MFish does not consider that section 14A is applicable to kingfish fisheries because:

- there is no associated species that requires commercial fishing to that level;
- there would be detrimental effects on non-commercial fishing interests; and,
- of the potential for adverse ecosystem effects.

29 MFish believes that the s 13 management arrangements are appropriate for kingfish. Under s 13 there is a requirement to maintain 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.

### Proposed Target Level

30 Before setting the TAC the Minister is required to consider the appropriate target level for the stock. Section 13 of the Act provides the opportunity to manage stocks at or above  $B_{MSY}$ . As outlined in the guidelines section (page 9, para 47), the decision to manage a stock at or above  $B_{MSY}$  can be made on utility grounds because in some fisheries the target level for the TAC can provide benefits that will improve utility from the available harvest.

31 Estimates of utility for kingfish are outlined in the socio-economic section above. These values indicate the kingfish fishery is valued more highly by recreational fishers than commercial fishers. However, as noted in the guidelines section (page 43, para 99), there is a significant degree of uncertainty surrounding these valuations.

Despite this uncertainty, MFish believes the available information suggests an overall increase in utility would result from by providing greater opportunity for recreational catch of kingfish.

- 32 MFish considers that one way to provide this benefit is management of the stock above the biomass that will support the MSY. Management above MSY will provide a greater range of size classes of fish that will benefit recreational fishers as kingfish is regarded as a trophy species. In addition, abundance of the species will be greater once the proposed target level is achieved. However, there is neither information to assess when the target level has been reached nor how long it will take to be reached.
- 33 One of the impacts of management above MSY is that there is reduced yield from the fishery when compared to management at MSY. However, in the absence of an estimate of  $B_{MSY}$  and an assessment of the current stock status there is no estimate of the size of the reduction in yield that might be required to meet the target level proposed.

### ***Rationale for proposed TACs***

- 34 In the absence of estimates of stock size and yield (MSY), the proposed TACs are based on the current levels of utilisation of the fishery (option 1) or on a proportion of these (option 2). Proportional reductions in current utilisation of 20% are proposed as an option for key kingfish stocks. The choice of 20% as a level of reduction is based on an assessment that it is achievable with a limited impact on the current fishery and is likely to be sizeable enough to initiate a rebuild of key kingfish stocks.
- 35 Recreational fishers have expressed concerns over what they perceive is a marked decline in the size of kingfish available to them in recent years. Industry submissions in the past have pointed to the lack of information to support any suggestion of a decline in stock size. There is little information to confirm either claim. The uncertainty regarding both the sustainability of current catch and the position of current stock levels in relation to a size that will support MSY is noted in the 2001-02 Plenary Report.
- 36 Given the long history of exploitation of kingfish stocks they are not likely to be at or near the virgin biomass ( $B_0$ ). Further, the fishery has a history of poor reporting (the plenary report notes the likelihood of illegal catch and landings by area is poorly reported in some years), and it may be that commercial catches were considerably larger during the 1980s. The introduction of a MLS in 1993 was expected to result in a short-term reduction in landings, but landings were expected to improve as fish grew through to the MLS. Declining commercial landings over time may well be greater than can be explained by the introduction of a MLS in 1993 and the removal of the trawl exemption in 2000. This is particularly the case in KIN 1, the area of most concern to recreational fishers, although it should be noted that the number of vessels reporting landings of kingfish (a measure of fishing effort) has also declined over time.
- 37 Although inconclusive, recent trends in commercial landings from some QMAs suggest the need for caution in setting catch limits and allowances for the future. The uncertainty of the status of the stocks provides further support for an approach that lowers the risk of not achieving the management objective. The reduced TAC option

presented provides greater certainty of achieving stock levels above  $B_{MSY}$  within a reasonable timeframe.

- 38 The proposed TACs have been calculated using average commercial landings for the period between 1993 and 2002 as MFish considers this period provides the best available information on current levels of commercial utilisation. It is also largely consistent with the method for evaluating the current recreational utilisation.
- 39 The average of the two most recent estimates of recreational landings has been used to estimate current recreational utilisation of the fishery.
- 40 There is no information on customary harvest, therefore MFish proposes to use 10% of the current level of commercial and recreational utilisation as an estimate of current customary harvest.
- 41 An estimate of other sources of mortality was developed by multiplying the sub legal catch by mortality rates derived for each method of fishing (refer to the section on other sources of mortality). No fishing related incidental mortality was assessed for customary fishing as it is assumed that all fish are retained.

#### *KIN 1*

- 42 MFish has proposed two options for the KIN 1 TAC as outlined in Table 2.

#### Option one

- 43 A TAC of 885 tonnes is proposed, based on the current levels of utilisation of the fishery.
- 44 This option assumes that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable, and the KIN 1 stock is likely to be at or above  $B_{MSY}$ . This position is uncertain and is not supported by either anecdotal information from the fishery or by recent trends in commercial landings, which have progressively declined in recent years. A TAC based on average levels of recent landings therefore presents a risk to sustainability and is unlikely to result in any fishery rebuild toward the proposed target level.

#### Option two

- 45 A TAC of 708 tonnes is proposed. This option is based on a 20% reduction to average landings to provide a greater certainty of achieving a target stock level above  $B_{MSY}$ . There is no information to suggest if, or how rapidly, the stock will rebuild under this option. However, MFish considers that a TAC set at a level lower than current utilisation will provide greater opportunity for the stock to reach the proposed target level despite uncertainty in information.
- 46 There are social and economic considerations associated with this option. There will be a short-term loss in value to both commercial and recreational fisheries from reduced landings. MFish assess that a reduction to current landings of 20% balances the risk attached to anecdotal information of a decline in abundance with the uncertainty in that information, and the possible socio-economic impacts. A more

detailed discussion of the socio-economic impact of this option is contained in the allowance section below.

## *KIN 2*

47 MFish has considered two options to set a KIN 2 TAC as outlined in Table 2.

### Option one

48 A TAC of 228 tonnes is proposed, based on the current levels of utilisation of the fishery. This option is based on the assumption that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable, and the KIN 2 stock is likely to be at or above  $B_{MSY}$ . This position is uncertain and is not supported by anecdotal information from the fishery, particularly in the area from East Cape to Tolaga Bay. Recent commercial landings have shown a decline from a peak in the mid-1990s. A TAC based on average levels of recent landings, therefore, presents a risk to sustainability and the achievement of the objective proposed for the management of kingfish stocks.

### Option two

49 A TAC of 182 tonnes is proposed. This option is based on a 20% reduction to average landings in order to provide a greater level of certainty of achieving a target stock level above  $B_{MSY}$ .

50 There are social and economic considerations associated with this option. There will be a short-term loss in value to both commercial and recreational fisheries from reduced landings. MFish assess that a reduction to current landings of 20% balances the risk attached to anecdotal information of a decline in abundance with the uncertainty in that information, and the possible socio-economic impacts. A more detailed discussion of the socio-economic impact of this option is contained in the allowance section below.

## *KIN 3*

51 A single TAC option is proposed for KIN 3 (Table 2). This stock is on the margins of the distribution of kingfish and landings and catches are occasional.

52 There is no estimate of biomass or available yield for this fish stock. In the absence of other stock information the proposed TAC is based on known or estimated levels of commercial, recreational, and Māori customary landings. A TAC of three tonnes is proposed.

## *KIN 7*

53 A single TAC option of 21 tonnes is proposed for KIN 7 (Table 2) based on the current levels of utilisation of the fishery. This stock is on the margins of the distribution of kingfish and landings and catches are small.

54 This option is based on the assumption that, in the absence of confirmed information on fisheries trends and stock size, current catch is sustainable and the KIN 7 stock is



likely to be at or above  $B_{MSY}$ . This position is uncertain, although recent commercial landings have shown a stable-increasing trend. A TAC based on average levels of recent landings presents some risk that the proposed target level for management of kingfish stocks will not be achieved. However, because of the low levels of catches an alternative option is not proposed for this stock.

#### *KIN 8*

55 MFish proposes two options for setting the KIN 8 TAC as outlined in Table 2.

##### Option one

56 A TAC of 108 tonnes is proposed, based on the current levels of utilisation of the fishery.

57 This option assumes that, in the absence of confirmed information on fisheries trends and stock size, current landings are sustainable and the KIN 8 stock is likely to be at or above  $B_{MSY}$ . However, this position is uncertain. Recent commercial landings have been relatively stable, and the average of commercial landings is at similar levels to current landings. Anecdotal information from the recreational sector suggesting declines in the availability of this stock is limited. A TAC based on average levels of recent landings therefore presents a limited risk that the target level proposed for the management of kingfish stocks will not be achieved.

##### Option two

58 A TAC of 86 tonnes is proposed based on a 20% reduction to average landings. This option is intended to provide a greater level of certainty of achieving a target stock level above  $B_{MSY}$ .

59 There are social and economic considerations associated with this option. There will be a short-term loss in value to both commercial and recreational fisheries from reduced landings. MFish assesses that a reduction to current landings of 20% balances the risk attached to anecdotal information of a decline in abundance with the uncertainty in that information, and the possible socio-economic impacts. A more detailed discussion of the socio-economic impact of this option is contained in the allowance section below.

#### *KIN 10*

60 A single TAC option of one tonne is proposed for KIN 10 (Table 2). This stock is on the margins of the distribution of kingfish, and only occasional commercial landings have been reported.

61 There is no estimate of biomass or available yield for this fish stock. There is no known recreational and Māori customary fishing in this area. In the absence of other stock information, the proposed TAC is based on current levels of commercial utilisation.

## Allocation

### *Proposed allowances and TACCs*

- 62 The TAC constitutes a composite of the respective stakeholder groups' catch allocations, plus any other fishing-related mortality. When setting any TAC, a TACC must be set, as well as allowances determined for the Māori customary and recreational fishing interests and for any incidental fishing related incidental mortality.
- 63 The Act stipulates a process by which the TAC is to be allocated. However, 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.
- 64 The Minister is required to make separate decisions on allowances and TACCs for each stock. MFish propose allowances and TACCs as shown in Table 3.

**Table 3: Options to set TACs allowances and TACCs for kingfish stocks:**

Stock	TAC	Customary allowance	Recreational allowance	Recreational fishing-related incidental mortality	TACC	Commercial fishing-related incidental mortality
<b>KIN 1</b>						
Average landings	885	76	600	24	156	29
Proportional	708	76	460	31	119	22
Utility	708	76	504	33	80	15
<b>KIN 2</b>						
Average landings	228	18	85	3	93	29
Proportional	182	18	66	4	72	22
Utility	182	18	92	6	50	16
<b>KIN 3</b>	3	1	1	-	1	-
<b>KIN 7</b>	21	2	10	1	7	1
<b>KIN 8</b>						
Average landings	108	9	40	2	50	7
Proportional	86	9	31	2	39	5
<b>KIN 10</b>	1	0	0	0	1	-

- 65 MFish has assessed allocation of the kingfish TAC based on the two allocation principles outlined in the guidelines section of this paper.
- A claim-based allocation 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.
  - A 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.

- 66 Both principles are consistent with the Act. MFish does not have a preference for one allocation principle over the other. As noted, there is a great deal of uncertainty with information used to assess utility value, particularly for the recreational sector where non-market valuation techniques are used.
- 67 The first TAC option for each kingfish stock is based on existing utilisation.
- 68 Two methods are proposed to allocate the second TAC option, which proposes reductions in existing use of key kingfish stocks. MFish uses proportions of existing utilisation (claim based approach) as a method to calculate the reductions to allowances required for the reduced TAC option (Proportional). The utility based allocation option uses estimates of utility provided in the recreational survey as the basis for reallocation of some catch from the commercial to the recreational sector. Consequently, the ratio of the allocations to each sector group varies under each option.

### ***Māori customary allowance***

- 69 The proposed customary allowances for each QMA are set out in Table 3.
- 70 No quantitative estimates of customary fishing for kingfish are available. It is unlikely that customary catch is at or near the level of the recreational catch. While kingfish is considered to be an important customary species, the numbers of recreational fishers taking this species is likely to significantly exceed the numbers of customary fishers. Kingfish is not a usual target species for customary purposes, and some of the customary catch is probably taken within the bounds of the daily recreational allowance of three kingfish per person. However, kingfish has a broad coastal distribution and can also be found in harbours, particularly in northern New Zealand. A significant level of customary catch could be anticipated. Māori have had an historic interest in kingfish and it might be an important food source in some localities. MFish would welcome submissions, particularly from Māori customary fishers, that provide information about levels of customary kingfish catch.
- 71 In the absence of quantitative information MFish proposes a customary allowance set at 10% of the current level of commercial and recreational utilisation. MFish does not propose to reduce the customary allowance under any reduced TAC option.

### **TACCs**

- 72 Proposed TACCs in tonnes for each QMA are set out in Table 4 below.

Table 4: Options to set TACCs for kingfish stocks:

	KIN 1	KIN 2	KIN 3	KIN 7	KIN 8	KIN 10
Average landings	156	93	1	7	50	1
Proportional	119	72			39	
Utility	80	50				

## **KIN 1**

### *Average landings*

- 73 There are three TACC options proposed for KIN 1. The average landings option proposes that the TACC be set at 156 tonnes, based on the average of recent commercial landings from this stock. MFish notes that for KIN 1 the average landings is 58 tonnes greater than for the most recent years landings.

### *Proportional*

- 74 This option is based around a TAC reduced by 20% from the average landings option noted above. Under this option average landings of recreational and commercial fishers is reduced proportionately. Specifically, MFish proposes that the TACC be set at 119 tonnes (a reduction of 37 tonnes from average landings). Despite the reduction from historical levels for KIN 1, MFish notes that the proposed TACC is 21 tonnes greater than for the 2001-02 fishing year. On the basis that the proposed catch limit is above landings from the most recent fishing year, MFish does not assess that there will be any negative socio-economic impact from this option.

### *Utility*

- 75 This option proposes the TACC be set at 80 tonnes, based on an approximate 50% reduction from the average of recent commercial landings.
- 76 The level of TACC proposed represents a shift in allocation from the commercial to the recreational sector based on utility value. MFish notes that the reduction represents a reduction of 18 tonnes from landings reported for the 2001-02 fishing year.
- 77 It is not clear whether this reduced TACC would impact on the ability of fishers to target species in fisheries where kingfish is taken as a bycatch. MFish considers that the fishery characteristics (particularly the relationship between kingfish and other target fisheries) suggest that a 80 tonne TACC may represent the minimum amount necessary to provide a manageable level of bycatch without detrimentally affecting the targeting of associated fisheries, although no quantitative assessment of this relationship has been undertaken.
- 78 MFish does not consider that recent reported commercial kingfish landings necessarily represent a minimum level in terms of a manageable bycatch. The distribution or location of some fishing methods is likely to influence the level of bycatch of kingfish. For example, longlining and setnetting in areas of reef or around promontories might expect a proportionally higher bycatch of kingfish than when fishing in other habitats. In an unrestrained management environment it is to be expected that some fishers have attempted to optimise the level of bycatch of kingfish. In addition, recently reported bycatch levels are based on current methods in use in the fishery. MFish notes that methods may change under QMS management.
- 79 It is likely that some fishers may need to change their fishing operations to fish at a time and in areas where kingfish are not present, which may have associated costs. If a change in fishing practices was not possible, then there may be a socio-economic

impact associated with this option, through either payment of deemed values for kingfish taken above ACE or reduction in catch of target species. No quantitative assessment of this possible impact has been undertaken to date. Submissions are sought from stakeholders on the possible impacts of this option.

## **KIN 2**

80 There are three TACC options proposed for KIN 2.

### *Average landings*

81 Option one proposes that the TACC be set at 93 tonnes based on the average of recent commercial landings. MFish notes that at this level, the TACC would be 32 tonnes greater than the landings reported for the 2001-02 fishing year.

### *Proportional*

82 This option is based around a TAC reduced by 20% from the average landings option noted above. Under this option average landings of recreational and commercial fishers is reduced proportionately. Specifically, MFish proposes that the TACC be set at 72 tonnes, a reduction of 21 tonnes from the average landings option. Despite the reduction from historical levels for KIN 2, MFish notes that the proposed TACC is 11 tonnes greater than the most recent years (2001-02) landings.

### *Utility*

83 Under this option the TACC would be set at 50 tonnes based on a 50% reduction from the average of recent commercial landings. This level of TACC probably allows a minimum level of kingfish bycatch to be taken without detrimentally affecting the targeting of associated fisheries. The level of TACC proposed represents a shift in allocation from the commercial to the recreational sector based on value. MFish notes that the proposed TACC represents a reduction of 11 tonnes from landings reported for the 2001-02 fishing year.

84 It is not clear whether this reduced TACC would impact on the ability of fishers to target species in fisheries where kingfish is taken as a bycatch. MFish considers that the fishery characteristics (particularly the relationship between kingfish and other target fisheries) suggest that 50 tonnes may represent the minimum amount necessary to provide a manageable level of bycatch without detrimentally affecting the targeting of associated fisheries. However, no quantitative assessment of this relationship has been undertaken.

85 However, it is likely that some fishers may need to change their fishing operations to fish at a time and in areas where kingfish is not present which may have associated costs. If a change in fishing practices was not possible, then there may be a socio-economic impact associated with this option through either payment of deemed values for kingfish taken above ACE or reduction in catch of target species. No quantitative assessment of this possible impact has been undertaken to date. Submissions are sought from stakeholders on the possible impacts of this option.

### **KIN 3**

- 86 There is only one TACC option proposed for KIN 3 of one tonne. MFish considers this TACC appropriately reflects the current level of use in this fishery.

### **KIN 7**

- 87 MFish proposes a TACC of 7 tonnes for KIN 7, based on the average of recent commercial landings. MFish notes that a TACC at this level is one tonne less than the reported landings for this stock for the 2001-02 fishing year.

### **KIN 8**

- 88 There are two TACC options proposed for KIN 8.

#### *Average landings*

- 89 Under this option the TACC would be set at 50 tonnes, based on the average of recent landings from this stock. MFish notes that the proposed TACC is four tonnes less than the reported landings from this stock in the 2000-02 fishing year.

#### *Proportional*

- 90 Under this option the TACC would be set at 39 tonnes, based around a TAC reduced by 20% from the average landings option noted above. Under this option average landings of recreational and commercial fishers is reduced proportionately. MFish notes that a TACC at this level is a reduction of 15 tonnes from the landings reported for the 2001-02 fishing year.
- 91 MFish considers that a TACC at this level may represent a manageable level of bycatch for this stock. Also, MFish considers that there is some ability for commercial fishers to fish areas and times to reduce the likelihood of kingfish bycatch, although this might lead to slightly increased costs of fishing.
- 92 Recreational fishing is of less significance in KIN 8 and MFish considers that the application of an adjustment to further reduce yields is not necessary at the level of commercial harvest reported for KIN 8.

### **KIN 10**

- 93 There is only one TACC option proposed for KIN 10. This is a minor bycatch fishery with current landings of one tonne. Accordingly, to provide for this continued level of utilisation a TACC of one tonne is proposed for this fishstock.

#### ***Management of commercial landings***

- 94 The TACC options noted above are based on an MLS of 65 cm. Commercial fishers are required to return fish below the MLS to the water. MFish assesses that this MLS contributes the majority of the commercial contribution to commercial fishing-related incidental mortality in the fishery (for example 29 tonnes for KIN 1 and KIN 2 based on average landings). There is no utilisation value attached to these fish.

- 95 MFish proposes that the recreational MLS be increased to 75 cm. It would seem inequitable that commercial fishers have a lower MLS than that of recreational fishers. One option is therefore to increase the commercial MLS from 65 cm to 75 cm. The impact of this measure would be to increase the other sources of fishing-related incidental mortality substantially (for example for the Proportional option an increase from 29 tonnes to 41 tonnes in both KIN 1 and KIN 2, from one tonne to four tonnes in KIN 7, and from five tonnes to 31 tonnes in KIN 8).
- 96 As an alternative, the commercial MLS could be removed. This would require commercial fishers to land all catch and would effectively reduce the commercial fishing-related incidental mortality to zero. This would make part of the allowance for other sources of fishing-related mortality available to other fishers to utilise. However, the requirement to land all catch taken would substantially increase commercial landings (the Snapper 8 Company Ltd and Akroyd Walsh data suggests that between 17-45% of the trawl catch of kingfish by weight is less than 65 cm).
- 97 Depending on assumptions about the proportion of fishable biomass currently undersized, it is possible that the TACC would constrain landings of kingfish under all of the options proposed (including those based on average landings). The impact of this constraint would be a requirement that fishers alter their fishing practices in order to avoid the catch of kingfish when targeting other species. It is unclear the extent to which any alteration in fishing practices would reduce the amount of bycatch taken. If it is assumed that TACCs would constrain landings, and it was not possible for fishers to alter their practices, then MFish concludes that this constraint would have the following implications.
- 98 Adding the proportion of the catch assessed to be undersized to landings for the 2001-02 fishing year provides a point of comparison to assess the implication (of proposed TACCs set with no commercial MLS) on fishing for associated species. This analysis suggests no implication for fishing on TACCs proposed under the average landings option, except for KIN 8 where fishing could be constrained by up to 21%. For TACCs set under the proportional option the analysis suggests reduction in fishing for associated species by up to 14% in KIN 1, 19% in KIN 2 and 38% in KIN 8. For TACCs set under the utility option the analysis suggests reduction in fishing for associated species by up to 44% in both KIN 1 and KIN 2.
- 99 MFish notes that the associated species that would be most affected include snapper, trevally and tarakihi. These are valuable fisheries having a combined total value of \$38 million, based on 2001-02 landings and port prices.
- 100 Fishers could either stop fishing once their kingfish ACE has been utilised or pay the deemed value on any kingfish landings made in excess of ACE thus increasing the cost of fishing. Removing the MLS could increase the cost of fishing in KIN 1, KIN 2 and KIN 8 combined by at least \$540,000 for the proportional reduction option, and by at least \$1.1 million for the utility option. This analysis is based on the payment of annual deemed values and does not apply differential deemed value rates.
- 101 Kingfish could be placed on the Sixth Schedule of the 1996 Act to reduce the socio-economic impact of constraining TACCs and provide fishers some flexibility to control catch. The Sixth Schedule provides a means for a commercial fisher to return fish to the water subject to stated requirements set out for that stock.

- 102 In general, most stocks are required to be retained by commercial fishers, and are therefore not listed on the Sixth Schedule. The requirement to retain fish taken provides an incentive for commercial fishers to ensure that their fishing activities are in line with the harvesting rights held, and reduces the potential for high grading of the catch.
- 103 However, in circumstances where the fish are likely to survive then the Sixth Schedule provides flexibility to manage landings. MFish assesses that kingfish is a robust species that is often brought on board the fishing vessel alive and can survive return to the water in most instances after capture by methods other than set netting. Set net caught kingfish would not be considered for this provision because they are not likely to be taken alive.
- 104 MFish considers it would be preferable if kingfish catch from trawl, purse seine and long line fisheries could be managed using the Sixth Schedule, which would specify that only fish that are likely to survive and can be returned to the sea as soon as is practicable after being taken are able to be released under this provision. However, MFish assesses that ensuring compliance with the Sixth Schedule provisions in order to prevent discarding of dead kingfish is potentially a significant problem, especially where a high deemed value relative to port price is proposed (as is the case with kingfish). Therefore, while this option would provide sufficient flexibility to mitigate the majority of the socio-economic impacts of a constraining TACC, it would require a commitment from industry to manage the more complex compliance issues that result, perhaps by means of a compliance code. MFish seeks the views of stakeholders on this option.

### ***Recreational allowance***

- 105 The proposed recreational allowances in tonnes for each QMA are set out in Table 5 below.

Table 5 Options to set recreational allowances for kingfish fishstocks:

	KIN 1	KIN 2	KIN 3	KIN 7	KIN 8	KIN 10
Average landings	600	85	1	10	40	1
Proportional	460	66			31	
Utility	504	92				

### ***Average landings***

- 106 Under a TAC based on the current level of utilisation of the fishery, the average of the two most recent estimates of recreational landing is proposed as the basis for setting the recreational allowance.

### ***Proportional***

- 107 Under the option of a smaller TAC for KIN 1, KIN 2 and KIN 8, reduced recreational allowances are proposed. Reductions to allowances have been calculated on the basis of the proportions of landings established for each sector by current levels of utilisation. The proposed allowances for each stock are noted in Table 5 above.



## *Utility*

- 108 Under this option MFish proposes to set a recreational allowance of 504 tonnes for KIN 1 and 92 tonnes for KIN 2. This option applies to KIN 1 and KIN 2 only, on the basis that these stocks are of most significance to the recreational sector. The rationale for this option is based on improving the utility by increasing the share of recreational harvest (based on the current comparison of commercial and recreational fishery values) while still providing for a viable level of commercial bycatch of kingfish.
- 109 MFish acknowledges that the levels of redistribution proposed are nominal and largely arbitrary (39 tonnes for KIN 1 and 22 tonnes in KIN 2). However, even these small quantities have the potential to improve the net value from these stocks. As noted, the information on marginal utility values is uncertain, and there is no information to suggest where the optimal point of allocation lies. Whether any real benefit to the recreational sector will accrue from the proposed reallocation in the context of their existing predominance in the fishery is unclear.
- 110 Further, MFish notes that commercial limits proposed for all options are already relatively small, and there are limitations on a redistribution of allowances while retaining a viable level of commercial bycatch. MFish considers that maintaining a viable level of commercial bycatch is important. To do otherwise is likely to result in unavoidable commercial fishing mortality that would be wasteful and limit utilisation. If commercial catches are to be limited to minimum bycatch levels only, MFish acknowledges that a redistribution of quota or ACE within the commercial sector will be required to reflect changes in fishing practises that have occurred since 1990-92.

## ***Management of the recreational landings***

- 111 In order to constrain recreational removals within the reduced allowances proposed above, and provide biological benefits to the stocks it is proposed that the recreational MLS is increased from 65 cm to 75 cm.
- 112 A MLS of 65 cm for kingfish was first introduced in 1993 and now applies to all commercial and non-commercial fishing. At varying times a further increase in the MLS has been proposed.
- 113 Imposition of a MLS was an effective mechanism to reduce landings in both commercial and non-commercial fisheries. In a QMS environment commercial catches can be managed to a catch limit. This is not the case for recreational fishing. An increase in the MLS is an effective measure to reduce landings, and this measure also has biological benefits for kingfish stocks.
- 114 Current scientific information suggests that 65 cm is below the size of maturity for most kingfish. The size at which 50% of the fish of a given species achieves sexual maturity is a common target for a MLS in order to provide the opportunity for fish (on average) to reproduce at least once. Current information suggests that 50% of females reach maturity at 97 cm and 50% of males reach maturity at 70 cm.
- 115 A further rationale for a MLS is to optimise yield per recruit. In general, there is more benefit to the fishery by delaying recruitment to the fishery until fish have passed

through the most rapid phase of their growth. Age and growth of kingfish is currently uncertain, and no yield per recruit analysis has yet been undertaken.

- 116 Recreational landings can be reduced, at least in the short term, by an increase in the MLS. This is a more effective mechanism than a change in bag limit (currently three per person per day) because few recreational fishers land more than one kingfish in a day.
- 117 Some game fishing clubs and charter boats operate to a self-imposed minimum size limit of 100 cm and have suggested this becomes the MLS. Available information supports imposition of a MLS of 97 cm to ensure that 50% of all kingfish reach the size of sexual maturity. However, benefits to the fishery will still accrue from a lesser MLS by delaying recruitment to the fishery until fish have passed through the most rapid phase of their growth.
- 118 MFish has considered a range of MLS between 65 cm and 100 cm. Data suggests that only 16% of the fishable biomass is greater than 100 cm. Therefore, subsistence fishers might be detrimentally affected by an immediate change in MLS to 100 cm and some recreational fishers might resent having to release fish that weigh up to 12 kilograms without a period of rebuilding of the fishery. Apart from the option based on average landings, MFish has proposed an increase in MLS from 65 cm to 75 cm for recreational fishers as this is expected to constrain landings within any of the proposed allowances. It is also a step towards the biological standard (the average length at maturity of males is encompassed within this size limit), and can be reviewed over time. MFish considers that any greater increase in MLS in the short term might have an undue short-term impact on some recreational fisheries.
- 119 MFish favours a nationally consistent MLS for biological, compliance and education purposes, and proposes that any increased MLS apply to stocks where no reduction in allowance is proposed.
- 120 Within the allowances set, some recreational fishers may favour a higher MLS in order to promote a more rapid rebuilding of stocks. MFish would welcome submissions from recreational fishers, on their preference for a MLS and whether a phased or immediate adjustment to the MLS is supported.
- 121 Please note that allowances may change depending on final decisions regarding the MLS.

### ***Allowance for other sources of mortality***

- 122 Information regarding other sources of fishing related incidental mortality is contained in two studies undertaken in KIN 1 (*Size and condition of kingfish in SNA 1* by Akroyd Walshe Ltd) and KIN 8 (*Size and condition of Kingfish on the West Coast of the North Island* by Snapper 8 Company Ltd) on trawlers.
- 123 Akroyd Walshe assessed the proportion of trawl caught kingfish in KIN 1 that were dead when brought on board. Observers were placed on 21 fishing trips, enabling the sampling of 489 trawl shots throughout the fishing year, although most of the records relate to trips between October 1998 to March 1999. The results show that 41% of

kingfish less than 65 cm where dead when brought on board. In addition, 72% of the kingfish caught by trawlers were less than 65cm in length.

- 124 The Snapper 8 Company Ltd assessed the proportion of trawl caught kingfish in KIN 8 that were dead after fishing for west coast trevally. Observations were made on 8 fishing trips, enabling the sampling of 129 trawl shots during February 2001 to April 2001. The results showed that 65% of kingfish under the size of 65cm were assessed as dead at the end of the sorting process. In this case 28% of the kingfish caught by trawlers were less than 65cm in length.
- 125 The Snapper 8 Company Ltd research indicates there is a substantial level of incidental mortality for kingfish associated with trawling. However, a component of this mortality is associated with handling practises on board vessels once live kingfish are taken. The Snapper 8 Company Ltd report noted that the catch is sorted and binned, and any discarding of kingfish is made at the end of this sorting process. MFish considers that set netting will induce greater levels of fishing-related incidental mortality than trawlers, and other methods such as long lining and seining induce much less mortality.
- 126 MFish considers that set netting will induce greater levels of fishing-related incidental mortality than trawlers, and other methods such as long lining and seining induce much less mortality.
- 127 It is likely that the capturing and releasing of undersized fish by non-commercial fishers, and tag and release, also induce low levels of fishing related incidental mortality.
- 128 The proposed allowances for other sources of fishing related incidental mortality for each QMA are set out in Table 3.
- 129 Fishing-related incidental mortality is associated with the catching and releasing of fish caught under the MLS of 65 cm. An assessment of the proportion of fish smaller than 65 cm in catches was made from length frequencies derived from data available from the commercial trawl fishery and for recreational fishing from the 1991 boat ramp survey data.
- 130 Estimates of fishing-related incidental mortality was derived by multiplying the estimated proportion of fish less than 65 cm in catches by mortality rates for each method of fishing. Mortality rates used were: 41% for the KIN 1 and KIN 2 trawl fishery (Akroyd Walshe), 65% for the KIN 8 trawl fishery (Snapper 8 Company Ltd), 100% for the setnet fishery (assumed), 5% for the bottom longline fishery (assumed), 10% other methods (assumed), 5% recreational fishing (assumed). No fishing related incidental mortality was assessed for customary fishing as it was assumed that all fish are retained.

### *Proportional*

- 131 The allowance for other fishing-related incidental mortality under the proportional and utility option includes an estimate of recreational fishing-related incidental mortality attributed to the proposed increase in the recreational MLS along with an allowance for commercial fishing-related incidental mortality. As noted in the TACC section,

this allowance would change depending on the suite of management options chosen to manage the commercial catch.

- 132 The proposed increase in the MLS for recreational fishers is expected to increase the level of incidental mortality because the new MLS will result in more fish being returned to the sea.
- 133 Assuming a 5% mortality of released fish, MFish analysis suggests the incidental mortality for recreational catch would increase from 24 tonnes to 31 tonnes in KIN 1, increase from three tonnes to four tonnes in KIN 2 and any increase would remain within the two tonne allowance assigned to KIN 8.

## **Other Management measures**

### ***Schedule 5A***

- 134 MFish does not propose to list any kingfish stock on Schedule 5A of the Act and proposes to allow under-fishing rights to be carried forward. Details of the proposal are set out in Annex two.

### ***Deemed values***

- 135 Deemed values are intended to provide economic incentives for fishers to balance their catch against ACE. They are also generally set at levels that discourage the discarding of fish if ACE is not held (an unlawful activity). Fishers are not required to hold ACE before fishing, except in specified fisheries.
- 136 Operational guidelines have been developed for setting deemed values. Kingfish does not strictly meet criteria for high value single species fisheries, which attracts a deemed value of 200% of the average port price (high value species are considered to be those with a value of \$4/kg or greater (kingfish is \$3.92)). However, the alternative standard of setting deemed value at 75% of the average port price is not considered inappropriate. It is not desirable that catch is landed in excess of ACE (a statutory consideration) because of the proposed management objective for this fishery. The use of the high value standard for deemed values is therefore proposed for consultation with stakeholders.
- 137 An additional option (Option 2) relates to the setting of the deemed value at the maximum of the range of port price. This option is proposed for the following reasons:
- There is a wide range in port price for kingfish (from \$2/kg to \$8.9/kg)
  - The average port price is influenced by the lower port prices reported by vertically integrated companies (those that catch process and market).
  - There are niche markets that attract substantially more than the average.
  - Overcatch of the TACCs will affect the interests of the non-commercial fishers in a fishery they highly value.

**Table 6: Options to set deemed values for kingfish stocks:**

<b>Options</b>	<b>Species fishstock</b>	<b>Survey port price (\$/kg)</b>	<b>Proposed % factor</b>	<b>Proposed Annual Deemed Value (\$/kg)</b>	<b>Proposed Interim Deemed Value</b>	<b>Differential deemed value (Y/N)</b>	<b>Overfishing threshold</b>
Option 1	Kingfish (KIN) 1, 2, 3, 7, 8,10	3.92	200	8.00	4.00	Y	N
Option 2	Kingfish (KIN) 1, 2, 3,7, 8, 10			8.90	4.45	Y	N

138 It is further proposed that differential deemed values are set to apply to different levels of catch in excess of annual catch entitlements for kingfish stocks (s 74(4)) of the Act as follows:

- a) For so much of a commercial fishers reported catch as does not exceed the fishers ACE by more than 20% the basic annual deemed value applies;
- b) For so much of a commercial fishers reported catch as exceeds the fishers ACE by more than 20% but not more than 40% then 120% of the basic annual deemed value applies;
- c) For so much of a commercial fishers reported catch as exceeds the fishers ACE by more than 40% but not more than 60 % then 140% of the basic annual deemed value applies;
- d) For so much of a commercial fishers reported catch as exceeds the fishers ACE by more than 60% but not more than 80% then 160% of the basic annual deemed value applies;
- e) For so much of a commercial fishers reported catch as exceeds the fishers ACE by more than 80% but not more than 100%, 180% of the basic annual deemed value applies;
- f) For so much of a commercial fishers reported catch as exceeds the fishers ACE by more than 100%, 200% of the basic annual deemed value applies.

139 In the case of a fisher who holds no ACE they are deemed to hold one kilogram (s 76 (2(c))).

### ***Over-fishing threshold***

140 The Minister may recommend to the Governor General an over-fishing threshold for a stock, specified as a percentage in excess of the ACE held by a commercial fisher for the stock to which it relates. If a commercial fisher's catch exceeds the ACE for the stock and the excess is equal to or greater than the over-fishing threshold then it becomes a condition of the fisher's permit that the fisher may no longer fish in the area of that stock (a tolerance level may be set and if set exceeded for this to occur).

141 The matters that the Minister may have regard to when considering whether to recommend an over-fishing threshold are:

- a) The effectiveness of deemed values in encouraging commercial fishers to acquire or maintain sufficient annual catch entitlement to cover their catch;

- b) The particular need, in relation to target stocks, to encourage fishers to acquire or maintain sufficient annual catch entitlement to cover their total catch;
  - c) Actual or potential risks to the sustainability of the stock;
  - d) Any other matters considered relevant.
- 142 It is not possible to assess (a), as kingfish is a new entrant to the QMS. Category (b) relates to target stocks and while there is potential to target kingfish, this species is primarily taken as incidental bycatch. There is a potential risk to the sustainability of kingfish (c) if commercial catch exceeds the TACC, but this risk is not considered to be critical at this stage. A relevant consideration (d) is the importance of achieving the management objective proposed for kingfish stocks because of the recreational importance of this species.
- 143 While a case exists that all mechanisms of the Act should be considered to ensure a balance between catch and TACCs particularly in KIN 1, MFish considers that the combination of the deemed values proposed and the proportionally increasing deemed values for fishers who exceed their ACE should be an effective set of balancing provisions. The performance of the deemed value system will be monitored to ensure it is effective in limiting commercial catch to the TACC.
- 144 Details of proposed changes to Reporting Regulations are contained in Annex two.

## **Preliminary Recommendation**

- 145 MFish recommends that the Minister:
- a) Note that there are two options for setting of TACs:
    - i) Average landings;
    - ii) Reduction of 20% to average landings.
  - b) Note that options for the allocation of the TAC vary by stock and is based on three principles:
    - i) Average landings;
    - ii) Proportional reductions in commercial and recreational allowances;
    - iii) Utility.
  - c) Note that the allowances vary within each option depending on the management tools used.
  - d) Note that the possible management tools for commercial fishers include;
    - i) Retaining the current MLS;
    - ii) Increasing the MLS for commercial fishers from 65cm to 75cm;
    - iii) Removing the MLS for commercial fishers;

- iv) Use of the Sixth Schedule to allow the release of live kingfish as soon as is practicable when taken by trawl, longline and purse seine if they are likely to survive.
- e) Note that use of (iv) above would be contingent on industry developing a code of compliance to mitigate against possible discarding fish in contravention of specified provisions;
- f) Note that it is proposed to increase the MLS for kingfish taken by recreational fishing from 65 cm to 75 cm fork length;
- g) Amend reporting regulations to reflect new fish stock codes;
- h) Set an annual deemed value of \$8.90 per kilogram for kingfish.





# ANNEX ONE

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## Species Information

### *Species Biology*

- 1 The New Zealand kingfish (*Seriola lalandi*) is sometimes referred to by its common names of kingi, yellowtail kingfish, amberjack, or its Māori name of haku. It should not be confused with the southern kingfish or gemfish (*Rexea solandri*).
- 2 Kingfish have a largely pelagic early life history, with juveniles often associated with rafts of floating debris or seaweed. Adult kingfish are large predatory fish that can exceed one and a half metres in length. They usually occur in schools ranging from a few fish to well over one hundred individuals. Adult kingfish tend to occupy a semi-pelagic existence and occur mainly in open coastal waters, preferring areas adjacent to rocky outcrops, reefs and pinnacles. However, kingfish are not restricted to these habitats and are sometimes caught or observed in open sandy bottom areas and within shallow enclosed bays and harbours.
- 3 In New Zealand, kingfish occur from latitude 29° to 46° S (Kermadec Islands to Foveaux Strait), but are predominantly found in the northern half of the North Island to depths of 200 metres. Kingfish are highly mobile, and gamefish tagging records include movements of fish from Australia to New Zealand, from New Zealand to Australia, moderate to long distances within New Zealand, and short distances within New Zealand. However, by far the greatest number of returns relate to short distance movements (even over many years at liberty) within New Zealand waters.
- 4 New Zealand kingfish are often found in association with schools of trevally and koheru, circling the outskirts of schools in search of prey. They are also known to prey on small pelagic species such as pilchard and anchovy, as well as squid, jack mackerels and yellow-eyed mullet.
- 5 Biological information on the growth, reproduction and longevity of kingfish is limited, although research on these issues is currently being undertaken. The stock productivity of the species is therefore unknown. Age determination using hard-structures such as otoliths has yet to be validated for New Zealand kingfish, and current growth estimates have been derived from less precise mark and recapture methods. Estimates of growth based on mark recapture data suggest that kingfish is a fast-growing species. Research is currently underway to revise and validate age estimation for kingfish. This will allow review of growth patterns and rates for this species. No published estimates of natural mortality are available for New Zealand kingfish. There is one record of a tagged New Zealand kingfish being recovered after 14 years at liberty.
- 6 A recent review of reproductive information for kingfish has led to a revision of estimates of the length at which kingfish attain (on average) sexual maturity. Current information now suggests that the fork length at which 50% of the kingfish have

reached sexual maturity is 70 cm for males and 97 cm for females. The current MLS for kingfish of both sexes is 65 cm.

## ***Fishery Characteristics***

### *Customary Māori catches*

- 7 Kingfish is an important traditional food for Māori, but no quantitative information about customary catch is currently available. The extent of the traditional fisheries for kingfish is described in the Muriwhenua Fishing Report (Waitangi Tribunal 1988). Given the coastal distribution of the species and its inclination to strike lures, it is likely that Māori caught considerable numbers.
- 8 The current catch of kingfish using customary permits is unknown. In 1999, new regulations applied to the taking of fisheries resources for traditional customary purposes from any New Zealand fisheries waters. Regulations provide for Tangata tiaki/kaitiaki once appointed to report customary catch that they have authorised. Tangata tiaki/kaitiaki appointments now cover only parts of the fishery and traditional customary harvest authorised by them, while recorded, will be incomplete for the fishery as a whole.

### *Recreational catches*

- 9 Kingfish is highly regarded by recreational fishers in New Zealand as a game fish. Kingfish are recognised internationally as a sport fish, and anglers taking kingfish in New Zealand waters hold 20 of the 22 International Game Fish Association (IGFA) World Records.
- 10 Kingfish are caught most often by recreational fishers from private boats and from charter boats, and are a prized catch for spear fishers and land-based game fishers. Recreational kingfish catch rates are greatest when the species is targeted, however, most kingfish are caught when targeting other species, predominantly snapper. In 1993-94, 61% of kingfish landed by recreational fishers participating in a diary survey were caught by hand line or rod and reel from boats (including live baiting, jigging and bait fishing) 17% by shore based fishing and 8% by spear fishers. Charter boat operations are an increasingly important part of the recreational fishing sector. Charter boats accounted for 15% of recreational kingfish landings estimated from the 1996 diary survey, and a survey suggests that these landings represent 39% of the charter boat catch as the majority of kingfish are released alive. In addition, the charter boat estimate does not include landings by visiting anglers from overseas (who made up 7% of charter fishers in 1997-98).
- 11 Obtaining estimates of the total recreational catch of kingfish is difficult. Recreational fishing surveys are designed to estimate the fish caught and killed, not those that are taken and subsequently released. In the kingfish fishery, where the recreational sector practises “catch and release”, the survey estimates are likely to be an underestimate of the actual level of catch (and hence measure of fish available to the sector and the potential mortality associated with fishing). Survey participants may have reported some released kingfish, however, MFish considers that it is unlikely that survey estimates include all fish caught and landed or released by the

recreational sector. Since 1991 there have been three telephone and diary surveys conducted to estimate national landings by recreational fishers.

Table 7. Recreational landings of kingfish (number of fish and tonnes greenweight) by QMA for 1992–93, 1996, and 1999–2000.

Year	1993-1994		1996		1999-2000	
	Number	tonnes	number	tonnes	number	Tonnes
KIN 1	87,000	390-600	64,000	350-410	127,000	800
KIN 2	2,000	(12)	5,000	(30)	25,000	138
KIN 3	-	-	3,000	(18)	-	-
KIN 7	-	-	-	-	2,000	11
KIN 8	12,000*	50-80*	2,000	(12)	9,000	65

- no estimate

() weight extrapolated from numbers of fish

\* estimate pertains to FMA 9 only.

- 12 A national survey estimated annual recreational landings of kingfish during the 1991-94 period to be 100 tonnes. However, 1993-94 estimates from the north region recreational survey suggested landings might be much greater for QMA 1 (390-600 tonnes) and the northern part of QMA 8 (FMA 9). A national survey conducted in 1996 produced an estimate of 350-410 tonnes in QMA 1. Recreational surveys also indicate 85 % of the recreational kingfish landings are taken in the northern QMAs (1 & 8). A survey conducted in 1999-2000 produced an estimate of kingfish landings of 800 tonnes for KIN 1 (compared to 350-410 tonnes in 1996). There remains some doubt about the estimates from both surveys. The uncertainty revolves around the participation rates of recreational fishers used in each survey. Those for 1999-2000 may be too high and those for 1996 may be too low. Assuming a common participation rate for both surveys will have the effect of lowering the 1999-2000 estimate and increasing the 1996 estimate.

### *Commercial catches*

- 13 Commercial landings of kingfish are reported largely as bycatch of inshore setnet, trawl and bottom longline fisheries. Since 1991, targeting of non-QMS species, including kingfish, has been prohibited unless the species is authorised on a fisher's permit. A few permit holders are authorised to target kingfish, and most of their catch is taken using setnets. There is no current commercial catch limit on kingfish, but a MLS of 65 cm has been in place since October 1993. Between 1993 and 2000, the MLS did not apply to kingfish taken by trawling. Since December 2000, the MLS has applied to trawl-caught kingfish. A minimum net mesh size of 100 mm applies to both commercial and non-commercial netting for kingfish.
- 14 The main commercial fishing areas for kingfish are the east (QMAs 1 and 2) and west coast (QMA 8) of the North Island. The largest commercial catches generally come from QMA 1, and most likely reflect the relative abundance of kingfish in this QMA compared with other areas.

### *Catch and landing by QMA*

- 15 Reported commercial landing summaries of kingfish for each QMA for the fishing years 1990–91 to 2001–02 are given in Table 2.

Table 8. Reported commercial landings (tonnes) of kingfish by QMA from 1990–91 to 2001–02.

Fishing Year	QMA						Total
	1	2	3	7	8	10	
1990-91	288	88	3	2	52	<1	433
1991-92	369	95	3	3	45	9	515
1992-93	365	81		1	83	<1	543
1993-94	172	64	2	4	37	<1	279
1994-95	198	76	1	5	28	<1	307
1995-96	203	121	2	6	48	<1	381
1996-97	185	112	2	7	24	6	363
1997-98	142	114	1	7	22	1	318
1998-99	151	101	3	11	51	<1	317
1999-00	112	99	2	9	51	0	273
2000-01	142	89	3	10	73	<1	318
2001-02	98	61	1	8	54	<1	222

16 Recent total reported landings (Table 8) across all QMAs peaked in 1992-93 at 543 tonnes, with 67% of these from QMA1. The reported catch of kingfish for all QMAs decreased considerably by 1993-94, mainly because of reduced landings from QMA 1. Likely reasons for this decrease include: (a) the effect of the October 1993 introduction of a MLS (MLS) of 65 cm on all methods other than trawl; (b) changes in fishing patterns in the snapper and trevally target set net, trawl, and bottom longline fisheries (that are responsible for most of the bycatch of kingfish); (c) decreased target fishing for kingfish, and (d) set net area closures in QMA 1 which applied from October 1993. The trawl exemption with respect to the MLS was removed in December 2000.

17 The annual reported commercial landings of kingfish from QMA 1 and QMA 2 have declined since 1993-94. Recent landings from QMA 8 have generally been stable, in the region of 50 tonnes per year.

### Catch by fishing method

18 Total kingfish catch (tonnes) by main commercial fishing method for all QMAs combined from 1990-91 to 1999-00 is shown in Table 9.

Table 9: Total kingfish landings (tonnes) by main commercial method for all QMAs combined, for fishing years 1990–91 to 2001–02:

Method	Fishing year											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Bottom longline	64	72	85	38	51	54	41	32	27	39	63	44
Bottom pair trawl	6	6	7	3	3	10	5	2	4	4	5	3
Bottom trawl	64	68	84	37	40	68	110	106	119	114	104	58
Danish/Beach seine	10	16	22	18	15	7	12	9	8	8	5	5
Midwater trawl	0	0	0	0	1	0	0	0	1	0	31	20
Purse seine	10	8	1	7	11	6	25	3	27	1	1	2
Set net	168	224	217	100	114	136	131	109	74	49	54	43
Trolling	24	9	18	11	11	8	5	8	2	1	2	4
Unknown	86	112	111	65	62	91	33	49	56	58	54	46
<b>Total</b>	<b>433</b>	<b>515</b>	<b>543</b>	<b>279</b>	<b>308</b>	<b>381</b>	<b>363</b>	<b>318</b>	<b>317</b>	<b>273</b>	<b>318</b>	<b>222</b>

Note: Fishing year '1991' is fishing year 1990–91.

19 Set net, bottom trawl, and bottom longline account for the majority of the kingfish commercial landings. The largest historical landings have been by set net. Trolling,

purse seine, bottom pair trawl, and Danish/beach seine each accounted for lesser amounts.

- 20 The total set net landings decreased from 48% of the landings in 1991-92 to 24% in 2001-02, as a result of the introduction of the MLS, set net area closures and changes in fishing patterns.
- 21 The annual landings of kingfish taken by trawling remained relatively stable across all QMAs until the 1996-97 fishing year when it increased probably due to increased trawling for trevally. There is a decline in kingfish landed from trawling between 2000-01 and 2001-02. MFish attributes this decline to the application of the MLS to trawl-caught kingfish from December 2000.
- 22 Most of the bottom longline kingfish landings comes from QMA 1. Landings have remained relatively stable through time, decreasing in more recent years to around 40 tonnes per year. Reported landings of kingfish by bottom longline reduced from 85 tonnes in 1992-93 to 38 tonnes in 1993-94. That is likely to be due to the introduction of the MLS.
- 23 Landings of kingfish by methods other than set net, trawl, or bottom longlines is relatively small. There has been development of a mid-water trawl fishery for jack mackerels that has reported bycatches of kingfish during 2000-01 and 2001-02. The purse seine fishery for pilchard in QMA 1 reported 26 tonnes of kingfish bycatch in 1998-99. However, that fishery reported no landings of kingfish in any other year.

#### *Targeted catch and bycatch*

- 24 Kingfish commercial landings by nominated target species for all QMAs combined in fishing years 1990-91 to 2001-02 are provided in Table 10.

Table 10: Kingfish landings (tonnes) by nominated target species for all QMAs combined, fishing years 1990–91 to 2001–02:

	Fishing year											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Snapper	90	114	110	51	63	90	69	51	59	54	87	51
Kingfish	72	51	43	23	28	31	12	33	8	6	12	3
Trevally	63	74	114	37	43	41	112	78	52	48	51	32
Tarakihi	30	37	33	17	21	20	21	22	31	35	26	15
Warehou	21	60	27	23	21	47	51	19	23	20	14	11
Gurnard	13	13	18	5	4	14	17	22	17	18	14	18
Other <sup>1</sup>	64	54	87	59	67	58	48	43	73	35	61	47
Unknown	80	112	111	64	80	80	32	51	54	58	53	45
<b>Total</b>	<b>433</b>	<b>515</b>	<b>543</b>	<b>279</b>	<b>308</b>	<b>381</b>	<b>363</b>	<b>318</b>	<b>317</b>	<b>273</b>	<b>318</b>	<b>222</b>

Fishing year '1991' is fishing year 1990–91

Note.1. Other species listed as target include rig, hāpuka/bass, barracouta, school shark, pilchard, albacore, jack mackerels, blue moki, and others with annual bycatch combined of typically < 5 tonnes.

- 25 Most kingfish is taken as a bycatch of the snapper and trevally fisheries. Target caught kingfish was the second most important component of the total catch in 1990-91, but the amount of landings reported as a result of target fishing has progressively declined to only 3 tonnes in 2001-02. Target fisheries for red gurnard, tarakihi, blue warehou, spotted dogfish or rig, hāpuku and bass, barracouta, school shark, pilchard,

albacore tuna, jack mackerels and blue moki also report small amounts of kingfish as bycatch.

### *Number of vessels reporting the catching and landing of kingfish*

26 The number of vessels that reported landings of kingfish is provided in Table 11.

**Table 11:** Number of vessels reporting catch or landing of kingfish for the fishing years 1990–91 to 1999–00

No. vessels reporting:	Fishing year											
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Catch or landing	635	654	704	637	589	516	516	439	403	398	316	273
Target catch	56	57	53	36	29	27	19	12	11	9	8	7

27 There is a relatively large number of vessels reporting landings of kingfish between 1990-91 and 2001-02, consistent with the largely bycatch nature of the fishery. Few vessels by comparison reported landing kingfish when kingfish was the nominated target species. The number of vessels reporting kingfish as either target catch or bycatch has decreased since the early 1990s, with only 7 vessels reporting target catch in 2001-02.

## **Other factors relevant to consideration**

### *Regulatory framework*

28 The recreational daily bag limit for all areas is three kingfish per fisher. The minimum mesh size for recreational set nets targeting kingfish is 100 mm. A MLS of 65 cm has been in place since October 1993.

29 Since the mid 1980s commercial target fishing permits for kingfish were restricted to certain methods. From 1991 kingfish became subject to regulations that restricted catch to bycatch only, except for those existing target fishers who had received a fishing permit in previous years. This meant kingfish could be legally landed only as bycatch of target fishing for another species, unless a target permit was held. An exception was the Central and Challenger Fishery Management Areas (QMAs 7 and 8, Figure 2) where kingfish target fishing permits were available using line methods only.

30 In 1992 a moratorium was imposed on non-QMS species, which restricted fishing permits to those who had reported a landing of non-QMS species in the previous two years. This was in anticipation of some of these species being introduced to the QMS.

31 A MLS of 65 cm was established for kingfish in October 1993. Between 1993 and 2000 this restriction applied to kingfish taken by all commercial methods except trawling. The rationale for not applying the restriction to trawl at that time was that most trawl caught kingfish were likely to be dead after hauling and sorting of the catch and would therefore be wasted if returned to the sea.

- 32 Following a review of this measure in 2000 the Minister of Fisheries considered that concern about sustainability, the need for equity between stakeholders for size limits, the biological reproductive data and compliance considerations, outweighed the concerns about wastage and economic loss to the industry. Accordingly, the regulatory exception provided in 1993 that enabled trawl operators to retain undersized kingfish was revoked in December 2000.
- 33 There is a regulatory provision that specifies a minimum net mesh size of 100 mm when taking kingfish.
- 34 MFish notes that there have been voluntary agreements to restrict the commercial take of kingfish. For example a voluntary agreement among commercial pilchard purse seine fishers to return all kingfish to the sea was made during 2000 in response to concerns about the possible impact of pilchard fishing on recreational interests in kingfish.
- 35 Trawling and Danish seining have been prohibited within two nautical miles of much of the shoreline of the Bay of Plenty, for much of the Hauraki Gulf, and within one nautical mile of much of the north-western coast of the North Island. The reasons for these closures include protecting juvenile fish that often tend to congregate in near-shore waters, and spatially separating commercial trawl and Danish seine vessels and non-commercial fishers.

#### *Consideration of other statutes*

- 36 Before setting any sustainability measure the Minister must 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 management plan under the Conservation Act 1987 that applies to the coastal marine area and is considered to be relevant by the Minister. MFish is not aware of any provisions in any strategy or planning document under the Resource Management Act or Conservation Act that are relevant to the setting of sustainability measures for kingfish stocks.
- 37 MFish notes that the setting of a sustainability measure (ie, a TAC) for the KIN 1 stock is consistent with s 7 and s 8 of the Hauraki Gulf Marine Park Act 2000. The Minister is required to have regard to these provisions. This Act's objectives are to protect and maintain the natural resources of the Hauraki Gulf.

#### *Consideration of conservation or fisheries services, and any relevant fisheries plan*

- 38 Before setting any sustainability measure the Minister must also take into account any conservation services or fisheries services, any relevant fisheries plan approved under the Act, and any decisions not to require conservation services or fisheries services. There is no relevant fishery plan approved that would have any bearing on the setting of TACs for kingfish stocks, and similarly no decision has been made not to require conservation services or fisheries services relevant to any kingfish stock.

## Fishery Assessment

- 39 Estimates of current and reference biomass are not available. Maximum constant yield (MCY) estimates from the commercial fishery were derived using the  $cY_{av}$  method (outlined in annual reports from the Fishery Assessment Plenary). The natural variability factor,  $c$ , is taken to be 0.6, which is based on the estimated natural mortality rate for New South Wales *S. lalandi* ( $M = 0.38$ ). MFish notes that determining estimates of natural mortality for New Zealand kingfish is part of a current research program.

Table 12 Summary of yields (t) from the commercial fishery, and reported commercial landings (t) for the most recent fishing year

QMA	FMA	MCY	2001-02 Reported Landings
KIN 1	1	195*	98
KIN 2	2	40	61
KIN 3	3, 4, 5, 6	5#	1
KIN 7	7	-	8
KIN 8	8	20	54
KIN 10	10	-	<1
<b>Total</b>		<b>260</b>	<b>222</b>

\* includes FMA 9

# includes QMA 7

- 40 MCY is based on average annual commercial catch ( $Y_{av}$ ) calculated using the fishing years 1983-84 to 1992-93 under the assumption that these years were relatively stable and may best balance out the many factors affecting this fishery.
- 41 The Report from the Fishery Assessment Plenary, May 2002 (available from MFish), notes that it is not known if recent combined commercial and recreational catch levels are sustainable or at levels that will allow the stocks to move towards a size that will support the MSY. The report also notes that recreational fishers are concerned about the perceived decline in the quality of the fishery.

## Associated fisheries

- 42 Kingfish bycatch at moderate levels is associated with target fishing for snapper and trevally and at low levels for eleven other target fisheries. The level of kingfish bycatch reported from these fisheries has been stable or declining over the past twelve years.

## Environmental Issues

- 43 Kingfish, as high-level predators, form an important ecological relationship with their prey, some seabirds, and possibly with some marine mammals. Kingfish circle and herd schools of prey when feeding and in doing so make available the prey species to other predatory species. There is no information on whether current kingfish fishing activities are detrimental to the long-term viability of any other species.
- 44 Kingfish is taken as a bycatch in trawl fisheries. The nature of trawling is that this method has an affect on the physical structure of the substrate and the benthic community structure. Most of the trawling where kingfish is taken as a bycatch is likely to occur in long-established existing trawl grounds where it is likely the original



benthic community will have been modified. MFish does not anticipate that introducing kingfish into the QMS will result in new areas being trawled.

- 45 There are no known areas where biodiversity or habitats of significance to fisheries management are likely to be adversely affected by fishing for kingfish.

### ***Current and Future Research***

- 46 Current research has the objective of determining age, growth and natural mortality for kingfish. Further research is being undertaken to determine the stock structure of kingfish in New Zealand waters.
- 47 NIWA is also collecting further samples of kingfish for analysis of reproductive condition from both east and west coasts of the north island during the 2002-03 summer. This information could be available to assist in a review of the MLS later in 2003.
- 48 Kingfish are amenable to mark-recapture. However, up to now, tagging studies have been conducted solely to determine kingfish movement patterns and to estimate growth. Gamefish tagging records (10 900 returns) show movements of fish from Australia to New Zealand, from New Zealand to Australia, moderate to long distances within New Zealand, and short distances within New Zealand. However, by far the greatest number of returns relate to short distance movements (even over many years at liberty) within New Zealand waters<sup>1</sup>. MFish is supporting the maintenance of a gamefish tagging database.
- 49 Research is being undertaken on the potential for both the enhancement and aquaculture of kingfish. Work is progressing on establishing breeding populations, rearing eggs through to juvenile stages and on growing cage-reared fish to three kilograms in 12 months. Further research is improving larval quality and developing methods of parasite control.
- 50 Research on the interrelationships between kingfish and other elements of the aquatic environment has been identified as an area for future consideration, however, this is a complex area of study and it is unlikely to be undertaken in the foreseeable future.
- 51 As mentioned, obtaining reliable estimates of recreational catch for kingfish has proved difficult. Further work to estimate, and to differentiate, recreational catches and landings are required.

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<sup>1</sup> 76% of returns were made five nautical miles or less from where they were released and 93% were made within 50 nautical miles.



## **ANNEX 2**

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### **Carrying Forward of Underfishing Rights**

- 1 MFish does not propose to list any kingfish stock on Schedule 5A of the Act and proposes to allow under-fishing rights to be carried forward. Details of the proposal are set out in annex two.

#### ***Schedule 5A***

- 2 Where commercial fishers are unable to land their full entitlement within a fishing year, the Act provides for the carry-forward of the lesser amount calculated under section 67A(2)(a) or 10% of the ACE that a commercial fisher holds at the end of the fishing year, to be fished in the subsequent fishing year. Therefore, under-fishing rights can accrue at the end of a fishing year and apply for fishing against ACE in the following fishing year. MFish considers that this degree of flexibility is unlikely to present any risk to the sustainable use of kingfish stocks at the conservative TACC levels proposed. The Act further provides that this carry-forward of ACE entitlement does not apply where a reduction in TACC has been implemented for the subsequent fishing year. Accordingly, MFish would not seek the addition of any kingfish stocks to Schedule 5A to prevent the use of the carry-forward of ACE provision.

### **Amendment to regulations**

#### ***Consequential Amendments to the Fisheries (Reporting) Regulations 2001***

##### *Background*

- 3 It is proposed to make consequential amendments to the Fisheries (Reporting) Regulations 2001 by amending:
  - a) Table 1 of Part 1 of Schedule 3 of those regulations that specifies the codes to be used when completing catch returns which must be furnished to the chief executive. This amendment will incorporate codes which reflect the revised Quota Management Areas (QMAs) for kingfish;
  - b) Table 2 of Part 1 of Schedule 3 of those regulations defining the specific QMAs defined by the Minister in his declaration of October 2002.
- 4 The Fisheries (Reporting) Regulations 2001 provide the framework for the completion and furnishing of statutory catch returns by fishers to the Chief Executive. Information contained in these returns is used for research, stock assessment, enforcement and administrative reasons (including balancing catch against ACE). With the Minister's decision to establish specific QMAs for kingfish stocks, it is necessary to amend these regulations to ensure that they reflect the decisions made, and to enable the effective and efficient operation of the QMS.

### *Problem definition*

- 5 The obligations for fishers to report their catch and the codes used to complete these returns should reflect the Minister's decisions on QMAs for each species to be introduced into the QMS on 1 October 2003.

### *Preliminary consultation*

- 6 No direct consultation on the need to revise these regulations has been undertaken as it is a consequential amendment flowing from the Minister's QMA decisions.

### *Options*

- 7 As the reporting framework is contained in regulations, there is no other option than to amend these regulations.

### *Costs and benefits of the proposal*

- 8 The proposed amendments clarify the obligations for commercial fishers when completing their statutory returns. Regulatory clarification means commercial fishers are aware of their reporting obligations and complete their returns in the simplest fashion possible.

### *Administrative implications*

- 9 Minor amendments to forms and explanatory notes will be required consequential to this regulatory amendment.

## **Conclusion**

- 10 Consequential amendments to the Fisheries (Reporting) Regulations 2001 are necessary to fulfil the requirements to effectively manage kingfish stocks within a QMS environment from 1 October 2003.