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Submission to: Primary Production Committee

Submission: Against the Fisheries Act 1996 Amendment Bill (No.2) 240-1 (2008)

From: option4/Hokianga Accord/New Zealand Big Game Fishing Council

Hearing: We wish to be heard by the Primary Production Committee

Introduction

1. The mid north iwi fisheries forum, representing the non-commercial fishing interests of the people of Tai Tokerau, the New Zealand Big Game Fishing Council and option4 jointly submit as the Hokianga Accord. We submit on behalf of non-commercial fishers, both customary and amateurs, and in the interests of all New Zealanders.
2. The Hokianga Accord aims to achieve “more fish in the water/kia maha atu nga ika ki roto i te wai”. We believe if the proposed amendment is given effect it will have the opposite result, namely less fish in the water.
3. Fish are one of the last wild populations sourced for food and New Zealanders enjoy and treasure their well settled common law rights to access the ocean to secure this food. These rights pre-date the middle ages and form a vital cultural plank in New Zealand society.
4. The Crown, as *parens patriae* (guardian), is both entrusted with and obligated to protect and provide for these rights, and ensuring that the manner in which we use this treasured resource, our *taonga*, does not deny our following generations a similar ability to source food. There is a continuum of oceanic riches dating back centuries and we have an overarching responsibility to preserve this productivity for future generations.
5. The Primary Production Committee is asked to take great care when considering the meaning and effect of this Bill, and not accept at face value the proposed amendment without fully understanding first the purpose and scheme of the Fisheries Act 1996 (the Act) and secondly, the critically important part the amendment would play in setting the total allowable catch (TAC). The TAC is the cornerstone sustainability measure which precedes allowing for non-commercial interests in the setting of the total allowable commercial catch (TACC).
6. The proponents of this amendment suggest this will address the problems they perceive from the Anton decision and wish to restrict Ministerial discretion, and

compel the Minister of Fisheries (the Minister) to set the highest possible justifiable TAC, regardless of the quality of information before him.

Problem Statement

7. The biomass or stock level that can produce the maximum sustainable yield is referred to as B_{MSY} . The Minister is unable to set or vary a TAC under section 13 without estimates of B_{MSY} , and is denied the use of section 14 under which TAC's may be set in the absence of B_{MSY} estimates.
8. Less than 4% of New Zealand's QMS fish stocks have B_{MSY} assessments. (Refer Appendix One).
9. The proposed amendment would set a TAC with the intent of achieving the maximum yield, even when it is unknown, thereby lessening the importance of the key sustainability provision in the Act.
10. This amendment would reinforce that B_{MSY} is the Minister's single goal when setting a TAC, and would deny any discretion to restrict catches when information is uncertain or unavailable.
11. Whereas the Act requires the Minister to exercise caution when information is poor, or an environmental risk exists. This amendment would offer no ability to express caution by choosing stock targets considered to best achieve the purpose of the Act.
12. Inclusion of a fish stock in Schedule 3 is the single mechanism available that enables a Minister to choose a TAC that best achieves the purpose of the Act and apply the principles, without reference to B_{MSY} . However, the biological impossibility test in s14(8)(b)(i) denies the Minister access to Schedule 3 in almost all cases.
13. In the interest of the environment (health of fisheries and aquatic environment) and the public's non-commercial interest in New Zealand's fisheries, the urgent introduction of the proposed amendment is both unnecessary and inappropriate. There is time for full consultation on other options before 1 October 2009.

Why does MFish want to amend section 13?

14. MFish argues that urgency is required to set TACs for Orange Roughy (ORH3B) and Bluenose (BNS) fish stocks this year, requiring a "quick fix" rather than a thorough review of the sustainability measures in the Fisheries Act.
15. However, we consider this is unsupported and the urgency for the proposed amendment, as stressed by MFish, is absent for the particular fish stocks in question for the following reasons:
 - a. Orange Roughy (ORH3B East and South Chatham Rise sub-stock) –
 - i. In 1990 the biomass was estimated to be about the size that would support B_{MSY} .
 - ii. Since then the TAC has been reduced by 68 percent for the ORH3B area as a whole.
 - iii. The current estimate of mature biomass is 98,000 tonnes (t) for this sub-stock, which is within the range of B_{MSY} estimates (90,000 to 135,000 t).

- iv. This year MFish have proposed two options for reductions spread over two or three years. They are to reduce the TAC by 1,080 t or 1,620 t in the first year.
 - v. This represents just 1.1 percent or 1.65 percent of the current biomass and is not sufficient on its own to constitute a rebuild.
 - vi. There is not sufficient urgency to implement all the reductions in a single year, in fact next year's information may change the size of the reductions required.
 - vii. The proposed reductions are a small step in the right direction but are not sufficient on their own to warrant emergency legislation.
- b. Bluenose –
- i. There is even less data and certainty about the status of the BNS stocks, particularly what proportion of the stock residing in deeper waters is available to be fished.
 - ii. There is currently no stock assessment available for any of the BNS stocks to allow estimation of B_{MSY} or current biomass.
 - iii. For years MFish and scientists have said that bluenose commercial catch rates are not reliable indicators of the abundance of bluenose. The decision to propose a TAC reduction is based solely on the decline in catch rates in the last few years.
 - iv. However, Catch Per Unit of Effort (CPUE) has also declined in areas where commercial catch is quite small. This would indicate that something other than fishing pressure might be contributing to lower catch rates
 - v. If MFish had wanted to implement sustainability measures for BNS they could have used section 14 rather than rush through emergency legislation.
- c. Kahawai (not considered for review in 2008) –
- i. On July 8th the Minister advised in a media statement, *“there is simply not enough time to carry out these reviews, adequately consult, and make fresh decisions in time for the start of the new fishing year on 1 October...There is new information to gather and consider and there must be an opportunity for fishers and the general public to have their say. With the recent history of this fishery and the complexity of the issues, this is not a process I am prepared to rush”*.

The Hokianga Accord submits: There is no urgency to amend section 13 of the Fisheries Act 1996 for sustainability purposes in 2008, and urges the Select Committee to carefully consider MFish's stated reasons for urgency.

Effect of the Amendment

- 16. The effect of the proposed amendment will be to further undermine the purpose and principles contained in Part 2 of the Act by focussing on commercial objectives (maximum yield) at the risk of the viability and ability of our fisheries to enable all New Zealanders to provide for their social, economic and cultural wellbeing.
- 17. Non-commercial fishers, both amateur and customary, will find it harder to catch fish with reasonable effort.

18. In particular clause 13(2A)(a) would direct that the Minister –

“not use the absence of, or any uncertainty in, that information as a reason for postponing or failing to set a total allowable catch for the stock; and..
[Emphasis added]

- a. This imports part of s10(d), forming part of the information principles, in such a way as to change both the meaning and importance of s10.

Section 10(d) provides 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 this Act.” [Emphasis added]

The intent and effect of including a modified part of 10(d) in 13(2A)(a) is to place greater weight and importance on the proposed clause 13(2A)(a) thereby (arguably) lessening the weight to be given to the information principles in section 10.

- b. This new clause also disregards the existing precautionary approach prescribed in the information principles within s10(c) which provides:

“decision makers should be cautious when information is uncertain, unreliable, or inadequate”.

The failure to make any reference to the precautionary approach is either an omission or possibly an indication that this proposed amendment is designed to modify and reduce the principled approach the Minister must take under s10 of the current Act.

- c. Setting a TAC is not a discretionary activity. The existing section 13(1) **compels** the Minister to set a TAC for each fish stock.

However, the obvious single reason for proposed clause 13(2A)(a) is to introduce the ability for the Minister to avoid applying the precautionary approach when information is uncertain, unreliable, or inadequate.

The Hokianga Accord submits: Clause 13(2A)(a) of the proposed amendment unnecessarily repeats parts of the information principles and, if enacted, may not achieve the purpose and principles in the Act.

19. Clause 13(2A)(b) would direct that the Minister –

“have regard to the interdependence of stocks, the biological characteristics of the stock, and any environmental conditions affecting the stock; and”

- a. This sub-clause imports a modification of parts of the environmental principles (not just environmental conditions) as contained in s9 of the Act.

Section 9(a) of the Act provides that:

associated or dependent species should be maintained above a level that ensures their long term viability:

Section 9(b) of the Act provides that:

the biological diversity of the aquatic environment should be maintained:

Section 9(c) of the Act provides that:

the habitat of particular significance for fisheries management should be protected.

Again, arguably, the intent and effect of including clause 13(2A)(b) is to erode the environmental principles within section 9 even though the application of s9 for all decision-making is similarly mandatory.

The Hokianga Accord submits: Clause 13(2A)(b) of the proposed amendment unnecessarily repeats parts of the environmental principles and, if enacted, may not achieve the purpose and principles in the Act.

20. Clause 13(2A)(c) requires that the Minister -

set a total allowable catch—

(i) using the best available information; and

(ii) that is not inconsistent with the objective of maintaining the stock at or above, or moving the stock towards or above, a level that can produce the maximum sustainable yield.

- a. The effect of this approach would be to move the TAC setting further away from a sustainability measure that aligns with the purpose and principles of the Act and transforms the TAC into a maximum justifiable catch regime, regardless of the quality of information. It would do this by effectively lowering the information standards and further constraining the Minister from taking a precautionary approach, regardless of the paucity of information to support the estimates relied upon.

This somewhat circuitous approach would promote B_{MSY} as the single management objective when setting a TAC. A Minister may no longer set out to achieve the purpose of the Act in the best possible manner by applying the tools under the Act. Rather, the Minister would be authorised to be concerned only with B_{MSY} or decisions that are *not inconsistent* with that objective.

In effect, the purpose of the Act in section 8 could be trumped or made subservient to clause 13(2A)(c).

- b. The proposed amendment would authorise the Minister, when he has no reliable biomass estimates, to set a TAC as if he was in possession of the most comprehensive and reliable estimates. The Minister would be able to apply any information, however uncertain, unreliable or inaccurate, to set a TAC that purports to allow for the maximum yield.

The Hokianga Accord submits: On the assumption that clauses 13(2A)(a) and (b) are given effect, clause 13(2A)(c) of the proposed amendment would oblige the Minister to set the highest, justifiable TAC based on poor information, thereby creating a potential sustainability risk.

Inter-relationship of Sections 13 and 14

21. The proposed amendment relates to the setting of TAC's under Part 3 of the Fisheries Act 1996. The Act provides the Minister four ways in which a TAC may be set.
22. Before setting any TAC the Minister first needs to examine the stock in such a manner that determines which TAC-setting provision of the Act is most appropriate based on the information at hand.

23. The flow chart (Figure 1) demonstrates that the Minister has approaches or options other than s13(2) to set a TAC. Other options are included in Appendix Three.
24. MFish may argue that it is not as simple as this, and that section 14 can only be used when it is not possible, because of the biological characteristics of the species, to estimate a maximum yield. MFish may that argue is different from having no estimate.
25. However, Parliament anticipated that, for a variety of reasons, information for many stocks would be unavailable or unreliable and provided for setting the TAC using Schedule 3.

Section 14 – Schedule 3 - application to certain fish stocks

26. The stocks in Schedule 3 are managed under section 14. The essential difference between section 13 and section 14 is that section 13 is concerned only with achieving a biomass that produces MSY.
27. Section 14 on the other hand does not mention B_{MSY} and has the objective of achieving the purpose of the Fisheries Act in section 8.
28. Section 14 is for fish stocks where the Minister, given the best information at hand, considers the purpose of the Act will be better achieved by setting a TAC without relying on biomass estimates.
29. It is obvious that the most common reason for using Schedule 3 to set a TAC is when biomass estimates are unavailable, unreliable, or unnecessary, and an alternative strategy is required. The Minister then adds the stock to Schedule 3 and then has the option to set the TAC under section 14. Schedule 3 exists for stocks like ORH1, and the Minister should use it when those criteria apply.

TAC's based on B_{MSY}

30. MFish argue that if this amendment is introduced then only B_{MSY} -targeted TAC's will be set by a Minister, and that the proposed amendment is required to enable the Minister to set a TAC regardless of the quantity or quality of the information.
31. However, the proposed amendment would *compel* the Minister to make decisions to set a TAC in some circumstances that could be at best be considered negligent, at worst reckless from a risk management perspective by always sanctioning the maximum possible catch so long as the information does not demonstrate that the effect of the decision will be to reduce the stock below B_{MSY} .
32. Given the lack of and uncertain nature of information on any fish stock, it is difficult to see how it can ever be demonstrated that a stock is below B_{MSY} .

How can stocks be added to Schedule 3?

33. Section 14(8) states:

The Governor-General may from time to time, by Order in Council, -

(a) omit the name of any stock from Schedule 3:

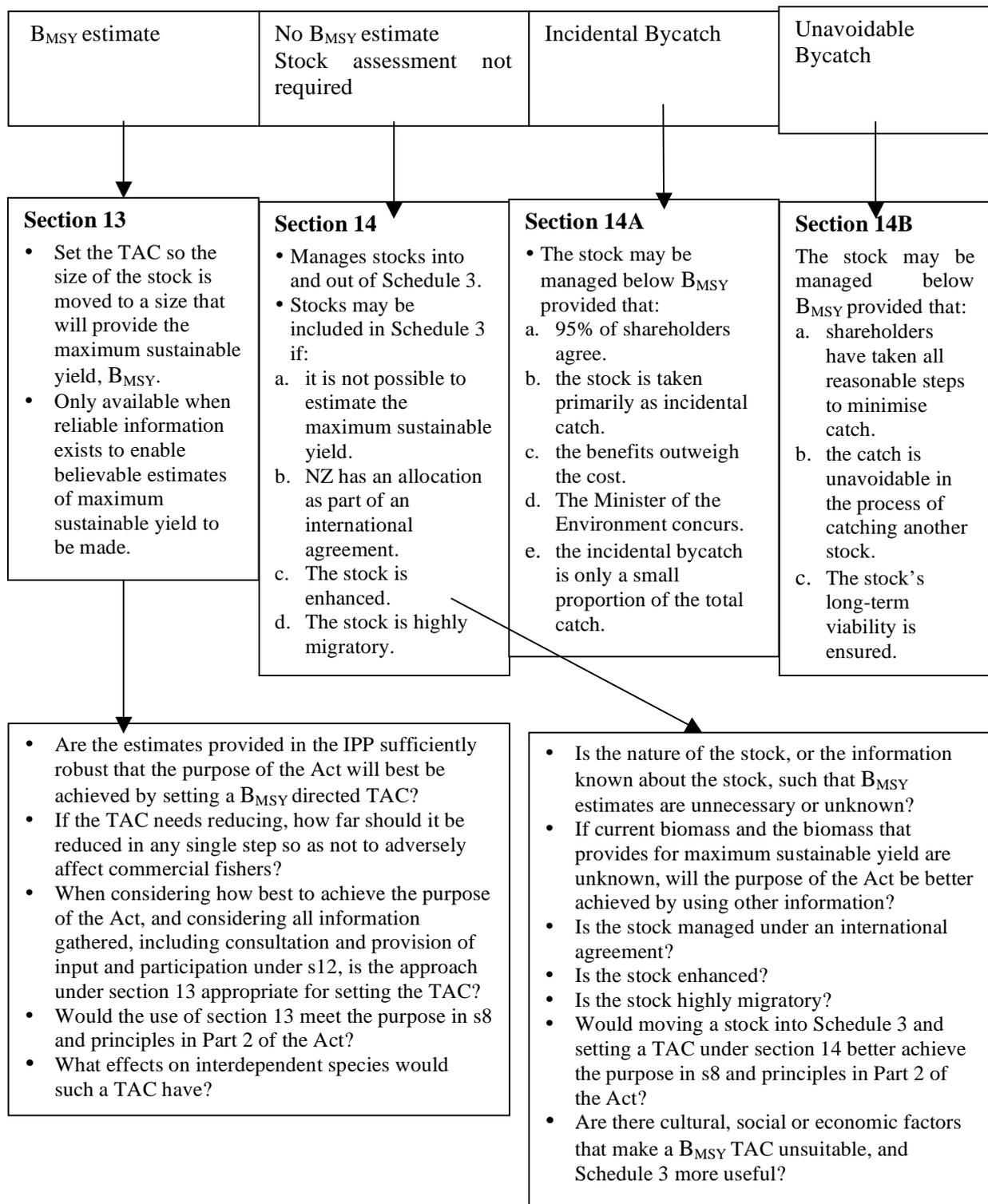
(b) add to that schedule the name of any stock if—

*(i) it is **not possible**, because of the **biological characteristics** of the species, to estimate maximum sustainable yield; or...*

34. Difficulties arise when we try to determine:
- how that discretion ought to be exercised.
 - what a biological characteristic is.
 - how would a characteristic differ between species in a way as to make one unable to determine a B_{MSY} estimate and one not.
 - What test would be applied to ascertain whether a stock could be added to Schedule 3 under s14(8)(b)(i).
35. In the Anton decision the High Court accepted *that B_{MSY} cannot be calculated accurately for many species*: [para 50].
36. In paragraph 52 Miller J. *noted that the legislation contemplates in s14 that there will be species in respect of which no estimate of B_{MSY} is possible*.
37. Miller J. also noted the parties' different reasons for saying that s14 would not apply to Orange Roughy. In paragraph 54 and 55 Miller J states,
- [54] *"I need not determine whether impossibility of estimating B_{MSY} is attributable to biological characteristics such that s14 is unavailable, and it is not wise to do so, not only for the reason given by Mr Cooke but also and more importantly for reason given in the next section of the judgment. For present purpose, the short answer to Mr Ivory's submission is that **the legislature foresaw the problem of impossibility of estimating B_{MSY} and established a separate mechanism, s14, to deal with it.**"* [Emphasis added]
- [55] *"...It is not for the Court to say whether policy dictates that s14 should be available when present ignorance of stock levels is attributable not to impossibility resulting from biological characteristics but to insufficient research into the relevant fish stock. **If it does the legislation wants amending.**"* [Emphasis added]

The Hokianga Accord submits: Schedule 3 is for stocks that do not have or do not need B_{MSY} estimates, but need a TAC. If there is an impediment in section 14 that prevents the Minister from using Schedule 3 then that should be the basis for an amendment.

Figure 1: The TAC-setting decision flow chart.



Purpose and scheme of the Act

38. Section 8 (purpose) describes in detail that the Act is about utilisation while ensuring sustainability. The Hon. Doug Kidd described the purpose and principles as ‘the religious bits’ in Parliament when the report of the Primary Production Committee on the earlier Fisheries Bill was discussed by Parliament in July 1996 (Hansard).
39. The purpose is defined as ‘conserving, using, enhancing and developing fisheries resources to enable people to provide for their social, economic, and cultural well-being’ in a way that ‘(maintains) the potential of fisheries resources to meet the reasonable foreseeable needs of future generations; and avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.’
40. In support of that purpose, sections 9 (environmental principles) and 10 (information principles) spell out what all persons exercising or performing functions and duties under the Act must do in relation to the utilisation of fisheries resources *or* ensuring sustainability.
41. As well as the Minister and Ministry officials being directed by sections 9 (environmental principles) and 10 (information principles) as outlined above, the very scheme of the Act is carefully designed so that the purpose is met or achieved. In particular this is in part done by Part 3 of the Act which is concerned with sustainability measures, the most important of which is the setting of the total allowable catch (TAC) described in the Parliamentary debates as ‘at the heart of the Bill in terms of managing our fisheries. That catch has to be set at or below a level that will enable the maximum sustainable yield of a fishery to be maintained.’
42. The remaining parts of the Act contain various tools and mechanisms relating to the QMS including the TACC, for which the starting point is allowing for non-commercial interests and all other mortality caused to the particular fish stock by fishing.
43. The Act is an important piece of environmental, social, economic and cultural legislation relating to the use of a wild resource for food by all New Zealanders and designed to ensure good guardianship and husbandry to provide abundance for present and future generations of New Zealanders.
44. In establishing the QMS to govern and regulate commercial fishing, the rights of non-commercial fishers including Maori customary are preserved and recognised and must be allowed for, and tools and mechanisms relating to the Crown’s obligations to Maori concerning non-commercial interests are included.
45. Concerning the environmental aspect of the Act as also stated in the Parliamentary debates ‘an important element of these provisions (sections 8, 9, and 10) is to complement other domestic legislation that manages the environment and to clarify the interfaces with other enactments.’

Summary

46. The proposed amendment further distances any TAC decision from the purpose and principles of the Act because it will compel the fisheries Minister to set the highest justifiable catch while withdrawing any concern for the reliability or availability of supporting information.
47. There is no urgency to amend section 13 of the Fisheries Act 1996 for sustainability purposes in 2008, and the Hokianga Accord urges the Select Committee to carefully consider MFish's stated reasons for urgency.
48. It seems a realistic danger that the proposed amendment introduces more complexity, and therefore legal uncertainty, into the decision-making process.
49. Clause 13(2A)(a) of the proposed amendment unnecessarily repeats parts of the information principles and, if enacted, may not achieve the purpose and principles in the Act.
50. Clause 13(2A)(b) of the proposed amendment unnecessarily repeats parts of the environmental principles and, if enacted, may not achieve the purpose and principles in the Act.
51. On the assumption that clauses 13(2A)(a) and (b) are given effect, clause 13(2A)(c) of the proposed amendment would oblige the Minister to set the highest, justifiable TAC based on poor information, thereby creating a potential sustainability risk.
52. The Transitional Provisions for section 12 are unnecessary if the proposed amendment is withdrawn, but if enacted, will contradict all the principles of kaitiakitanga. (Refer Appendix Two).
53. Schedule 3 is for stocks that do not have or do not need B_{MSY} estimates, but need a TAC. If there is an impediment in section 14 of the Act that prevents the Minister from using Schedule 3 then that should be the basis for an amendment.
54. B_{MSY} exists only in theoretical stock assessment models, never in nature, and when used as the primary management objective in an information-poor fishery may pose a significant sustainability risk. Many of the major fish stock collapses in the modern era (e.g. Atlantic cod) have had management decisions based estimates of MSY. B_{MSY} is a biological reference point and should never be the default or primary stock management target.
55. Maximum Sustainable Yield is an unobtainable concept.
56. Optimum Sustainable Yield strategies would be preferable to achieve the purpose of the Act than B_{MSY} strategies. The Minister could be empowered to choose the strategies that he or she considers will best achieve the purpose of the Act. (Refer Appendix Three).
57. An amendment that enables the Minister to choose the TAC for stocks that best achieve the purpose of the Act, having regard to the best information, is preferable both for utilisation and sustainability.

Recommendations

The Hokianga Accord respectfully requests that you recommend:

- that the Fisheries Act 1996 Amendment Bill (No.2) be withdrawn; and
- an amendment to section 14 of the Act, to enable the Minister to apply an alternative method of setting a TAC for stocks where B_{MSY} cannot be estimated.

Thank you for the opportunity to submit to this amendment.

Yours sincerely,



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Appendix One

Effects of reducing stocks to B_{MSY}

Non-commercial fishing interest groups and individuals have been working for over ten years to try to and prevent the further erosion of the common law right to fish.

Over the last three years this has involved the judicial review of what the Minister must consider when allowing for recreational fishers, specifically the Kahawai decisions through the Kahawai Legal Challenge.

Of particular concern to non-commercial fishers, both customary and amateur, is not just having a paper right to fish but to ensure that there are sufficient fish left in the water to maintain reasonable catch rates. Fishing a stock down to the biomass that will support the maximum yield greatly reduces the amount of fish in the water and their average size.

There are a number of fish stocks where the MFish have stated that the recreational catch is assumed to be proportional to the biomass (e.g. kahawai, west coast snapper). Generally, for inshore fish stocks B_{MSY} is 20% to 30% of virgin biomass. The lower the biomass the harder it is for recreational and customary fishers to catch a feed.

Only a few inshore fish stocks have stock assessments that provide estimates of B_{MSY} and virgin biomass (Table 1). Often even when a stock assessment model exists there is considerable uncertainty about the current biomass ($B_{current}$).

Table 1: Inshore finfish species where there is an estimate of B_{MSY} as a proportion of virgin biomass, N/A = not available.

Fish Stock	B_{MSY}/ B_0	Fish Stock	B_{MSY}/ B_0	Fish Stock	B_{MSY}/ B_0
Snapper		Kahawai		Trevally	
SNA1	22%	KAH1	24%	TRE1	N/A
SNA2	24%	KAH2	N/A	TRE2	N/A
SNA7	29%	KAH3	N/A	TRE3	N/A
SNA8	20%	KAH4	N/A	TRE7	29%
		KAH8	N/A		

There are no B_{MSY} estimates for blue cod, tarakihi, kingfish, hapuku. In fact a recent review of the 2007 MFish plenary reports¹ found that for most stocks B_{MSY} was not known (Table 2).

Table 2: Summary of the ways of stating whether $B_{current}$ was above or below B_{MSY} in the Status of the Stock section of the 2007 Plenary Report.

Description	Number of stocks	% of stocks
Not know (or not stated)	445	80%
$B_{current}$ near virgin (lightly fished)	78	14%
Non-quantitative (terms like 'likely' or 'believed to be')	11	2%
Quantitative (specific B_{MSY} estimate)	22	4%
Total	556	100%

The proposed amendment to section 13 will force stocks to be reviewed against the objective of moving the stock towards or above, a level that can produce the maximum sustainable yield even when there is not the information to determine what B_{MSY} is. Clearly it is the wrong section to use.

¹ Current Use of MSY-Related Reference Points in New Zealand, Chris Francis and Sophie Mormede, NIWA, 2008.

Appendix Two

The Transitional Provision for Section 12

Section 5 of the Fisheries Act requires that:

This Act be interpreted, and all persons exercising or performing functions, duties, or powers conferred or imposed by or under it shall act, in a manner consistent with –
(b) the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.

This accords with the ongoing obligation on the Crown to Maori under s10(b) of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (ToWFCSA) in relation to non-commercial fishing arising out of the 1992 Settlement. This obligation is expressed in part by the mandatory requirement in s12(1)(b) of the Fisheries Act 1996 which provides:

Before doing anything under any of sections 11(1), 11(4), 11A(1), 13(1), 13(4), 13(7), 14(1), 14(3), 14(6), 14B(1), 15(1), and 15(2) or recommending the making of an Order in Council under section 13(9) or section 14(8) or section 14A(1), the Minister shall -

b. provide for the input and participation of tangata whenua having –
i. a non-commercial interest in the stock concerned; or
ii. an interest in the effects of fishing on the aquatic environment in the area concerned -

*and have **particular regard** to Kaitiakitanga.*

Section 12 is a very important provision in the scheme of the Act. This is because by the mandatory process of consultation and the provision of input and participation of tangata whenua and having particular regard to kaitiakitanga in relation to a proposed TAC, the Minister is able to gather the necessary and vital information including the health and abundance of the particular fishery and the importance of that fishery to non-commercial interests, particularly tangata whenua, for food.

Apart from the need to intensely consult with tangata whenua about the reasons for and the effects of the proposed amendment, the concern is that a possible or even probable (and it is presumed unintended) effect of the proposed amendment to s13 will be at best to undermine this obligation or at worst place the Crown in breach of its statutory obligations under s5 of the ToWFCSA.

A serious risk with the proposed amendment is that it would allow s12 to be read-down or enable the mandatory obligation on the Minister under s12(1)(b) to be sidestepped.

Parliament has bestowed responsibility on the Minister, expressed in the section 8 purpose of the Act, of utilisation of New Zealand's fisheries whilst ensuring sustainability to safeguard and ensure healthy and abundant fisheries for future generations of New Zealanders.

Because the proposed amendment to s13 would sanction MFish's management practices, held unlawful by the High Court in the Anton decision, a more measured and considered approach to setting the TAC is warranted.

All New Zealanders, including non-commercial (customary and amateur) and commercial fishers, have vested interests in abundant fisheries. The Act must be administered and our fisheries managed for our collective benefit without damaging our fisheries.

Appendix Three

Alternative Management Regimes

Maximum Least-Cost Yield

In practice very few stocks have any reliable estimate of original biomass (B_0) or the biomass that will deliver maximum sustainable yield (B_{MSY}); which results in proxies being used. The usual proxy is to look at changes in catch per unit effort (CPUE) over time supplemented by occasional random trawl surveys.

A major problem with these proxies is that they have an inbuilt assumption that the method of extraction (bottom trawling) has no impact on productivity. This assumption has been proven false for many important inshore stocks. For many of these stocks the use of bottom trawling on firm-bottom seabed significantly reduces the ability of the stock to reproduce, and results in steady yields that are well below B_{MSY} .

Rather than delivering maximum sustainable biomass these proxies tend to deliver a maximised least-cost yield to industrial fishing practices. These are often at variance with the needs and aspirations of coastal communities for their social, economic and cultural wellbeing.

Whilst acknowledging the need for commercial uses to exist alongside other higher priority uses, there is a need for management to be directed not simply towards least cost extraction but to deliver least impact extraction that can deliver maximum productivity, with insurance margins for uncertainty, for the long-term benefit of all New Zealanders.

Optimum Yield - An approach preferable to B_{MSY} and MSY

The definition of MSY in the Act differs from the United Nation's definition of MSY. If the UN definition of MSY were contained in the Act, management of our fisheries by allowing a reduction of biomass down to 10 or 20 percent of virgin biomass (B_0) would not be authorised because of the adverse effects on the fishery that would impair 'renewability (of the particular fishery) through natural growth or replenishment.'

If a TAC was set without considering any potential or possibility of not impairing the stock's ability to reproduce itself, extreme care would be needed. This is because significant impairment could occur with few indicators before the collapse of a fish stock. For these reasons B_{MSY} estimates of 10 or 20 percent target of B_0 are simply not reliable and never able to be used.

The UN now prefers Optimum Yield (OY) because it takes the MSY concept and qualifies it to achieve the cultural, economic and social ambitions of the people.

Optimum Sustainable Yield (OSY), as it is now defined in the US Federal Sustainable Fisheries Act, is MSY minus a precautionary factor that reflects:

- a. the interdependence of stocks within the ecosystem;
- b. the inherent tendency in MSY models to over-estimate sustainable catch;
- c. the cultural and social aspirations of the people; and
- d. to better protect the stock from over-fishing.

Optimum Sustainable Yield strategies would achieve the purpose of the Fisheries Act far better than B_{MSY} strategies and the Minister should be left with the ability to choose the strategies that he considers will best achieve the purpose of the Act.