



Ministry of  
**Fisheries**  
Te Tautiaki i nga tini a Tangaroa

## FINAL ADVICE PAPER

# MANAGEMENT OF THE MARLBOROUGH SOUNDS AMATEUR BLUE COD FISHERY



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# Management of the Marlborough Sounds Amateur Blue Cod Fishery

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## Key Points

1. The Ministry of Fisheries (the Ministry) recommends that you re-open the area of the Marlborough Sounds (the Sounds) currently closed to amateur blue cod fishing on 1 April 2011 with the following new management measures in place (Option 2):

- i. A maximum bag limit of one blue cod per person per day; *two?*
- ii. A seasonal opening from 20 December – 31 August (*note: in first year, the season would begin when the fishery opened on 1 April*); *April-Aug.*
- iii. A minimum legal size limit of 30cm and a maximum legal size limit of 35cm; *40cm?*
- iv. A hook limit of two hooks per line when fishing for any species; ✓
- v. A personal accumulation limit of two daily bag limits; and ✓
- vi. A requirement for amateur fishers to possess blue cod in a whole or gutted state, unless for immediate personal consumption. ✓

2. The Ministry recommends that you apply these measures to the area defined as the Marlborough Sounds Area (MSA; Figure 1), rather than just to the area currently closed, because blue cod populations have declined in most parts of the MSA outside the closed area and because doing so will make the rules easier for fishers to remember and simpler for Ministry officers to monitor and enforce. ✓

3. The Ministry considers the measures will combine to: (i) manage amateur catch in the Sounds to levels likely to allow blue cod populations to increase (the bag limit and accumulation limit); (ii) protect pre-recruits and spawning fish (the fishing season, slot limit, and hook limit); and, (iii) support effective rule enforcement (the requirement to possess whole or gutted cod and application to the MSA).

4. The measures are cautious. The Ministry considers a cautious approach is warranted because:

- a. Preliminary information from recent surveys indicates that adult blue cod biomass has increased in the closed area since the closure began, but pre-recruit blue cod biomass has remained low or declined.
- b. A significant reduction in amateur catch compared to that occurring before the closure is required to achieve an increase in the blue cod populations while still allowing fishing. Three years after introduction of a three-cod bag limit in 2003, the blue cod populations in the Sounds had reduced on average by 25%. Information on amateur catch is unreliable but best available information suggests a two cod bag limit might reduce amateur catch by about 13% (cf. prior to the closure) and a one cod bag limit might reduce catch about 54%.

5. You may also wish to consider the following additional measures:

- i. An extension to the MSA (Figure 1), which would provide preventative protection to the most outer regions of the Sounds and further increase ease of enforceability. ✓
- ii. A no take area around Maud Island, which may provide an opportunity to monitor changes in the abundance and population structure of blue cod with removal of ✓

amateur fishing effort and benefit local populations within the rest of the Marlborough Sounds via the transfer of eggs and larvae.

- iii. Application of the accumulation limit and the requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption to the whole of the Challenger (East) Area (Figure 2), which would reduce the risk of blue cod being over fished in the future and would support fishery officers in enforcing the bag limit and minimum legal size limit in the Challenger (East) Area. ✓

6. These additional measures are not required for a rebuild of depleted populations, but they could confer additional benefits and may increase security of maintaining healthy local populations of blue cod in the region in the longer-term.

7. Nearly all submitters on the proposals agreed new management measures were required when the fishery reopened. The one-cod bag limit is likely to be considered too restrictive by amateur fishers and there is a risk of low buy-in from the amateur fishing community for this measure. An alternative way of restricting amateur catch may be a shorter seasonal opening (1 February to 31 August), so the fishery is closed during December and January when historically most amateur fishing for blue cod occurred. This option is reflected in the package of management measures provided in Option 3 and may be the appropriate choice if you consider a one cod bag limit overly restrictive.

8. Option 3 is considered to carry a higher level of risk that catches would not be reduced to a level that enables the blue cod populations to grow. In the medium term, fishers may transfer fishing effort to the open season and the effectiveness of this measure at reducing amateur catch may therefore be compromised. Most submitters did not support a seasonal closure over December and January, indicating that there may also be low buy-in from amateur fishers for a seasonal closure.

9. Some submitters raised concern about the closure being lifted earlier than 2012 as it is unclear whether local blue cod populations have increased to healthy levels. Preliminary information from the 2010 survey suggests adult blue cod biomass in the areas closed to fishing has increased since the 2007 but that pre-recruit (blue cod < 30cm) biomass in most of these same areas has remained at low levels or continued to decline. Option 1 retains the current temporary closure. Option 1 is the appropriate option if you wish to provide more time for blue cod populations in the Sounds to increase before providing for utilisation by amateur fishers.

10. If you choose to retain the closure (Option 1), the Ministry recommends you also choose a package of measures (ie, those in either Option 2 or Option 3) for implementation from 1 October 2012, which is the scheduled reopening date.

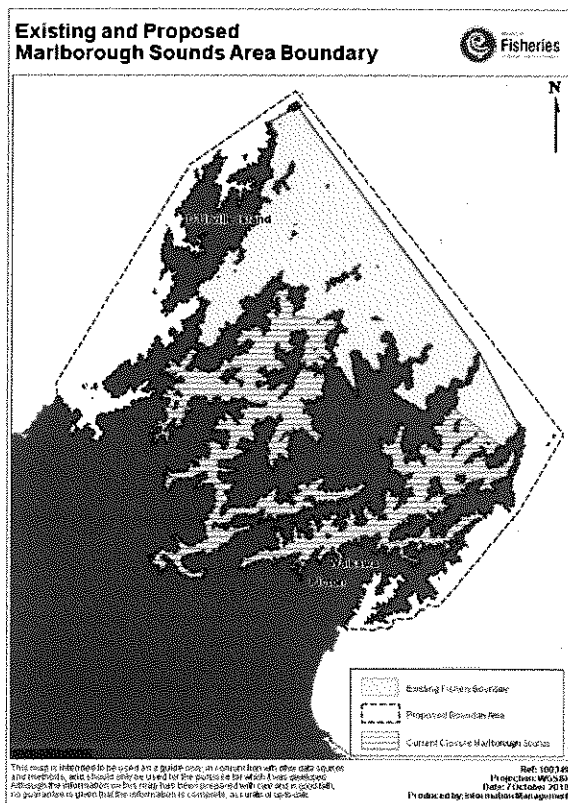
11. The Ministry notes that, no matter which option you choose, ongoing monitoring of the Sounds blue cod populations will inform future adjustments to management measures to ensure blue cod populations in the Sounds remain healthy and provide benefits to amateur fishers.

## Introduction

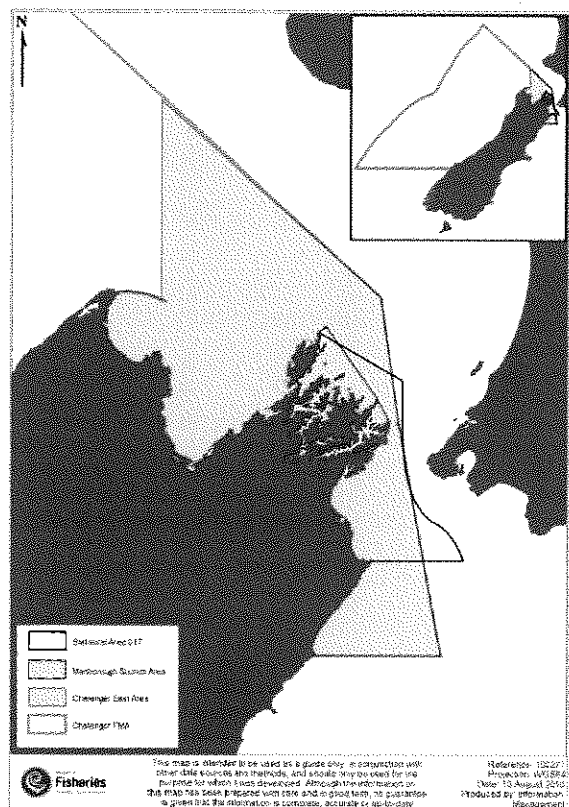
12. In 2008, the then Minister of Fisheries closed an area of the Marlborough Sounds to amateur fishing for four years (hatched area, Figure 1). The closure was implemented after previous management measures failed to limit amateur fishing effort to a level that allowed blue cod populations in the area to increase from depleted levels.

13. Shortly after the closure of the fishery, the Marlborough Sounds Blue Cod Management Group (BCMG) was established and tasked with formulating a management plan to support a lifting of the closure earlier than the scheduled date of 1 October 2012. The BCMG membership comprised representatives of amateur fishing interests from the Marlborough Sounds and Nelson.

14. The BCMG completed its management plan earlier this year and it formed the basis of a consultation document released in August 2010. This paper provides you with Final Advice on management of the Sounds amateur blue cod fishery.



**Figure 1. Boundaries of the current closed area, the Marlborough Sounds Area and the proposed extended Marlborough Sounds Area.**



**Figure 2. Boundaries of the BC07 quota management area (shown as "Challenger Area"), the Challenger (East) Area, Statistical Area 017, and the Marlborough Sounds Area**

## Available Information

### Biological Characteristics of Blue Cod

15. Key biological characteristics of blue cod (*Parapercis colias*) make them susceptible to the effects of fishing and to localised depletion. These are:

- a. blue cod populations (particularly the pre-recruit populations) tend to be concentrated into shallow non-mud habitat around the shorelines;
- b. blue cod (including pre-recruits) are voracious and non-selective feeders that easily take bait;
- c. blue cod are relatively slow growing and long lived, reaching a maximum age of 32 years;
- d. pre-recruits and adults are relatively resident (>60% of individuals have been estimated to not move more than 1 km during their lifetime);
- e. adults are believed to be territorial;
- f. populations are considered to have low connectivity, as eggs and larvae only remain pelagic for 10 days and fish are not expected to move between populations; and
- g. blue cod are protogynous hermaphrodites – females have the ability to change sex to males once they reach a certain size and this is likely to be controlled by local population structure.

16. Characteristics a and b result in blue cod being highly susceptible to fishing pressure. Characteristics b, c, d and e indicate that local blue cod populations may be vulnerable to fishing pressure across small scales (e.g., kilometres and 10's of kilometres) leading to localised depletion, and that populations may take a long time to recover once depleted.

17. For sex-changing species, it has been shown that selective fishing pressure can affect the mature population sex ratio, the timing of sexual transformation and thus the mean size and length frequency distributions. The removal of larger dominant males from the population is believed to result in more females changing sex and the sex change taking place when individuals are at a smaller size.

18. Reproductive output is considered to increase exponentially with fish size, so larger fish produce a larger number of more viable sperm, eggs and larvae. A reduction in the average blue cod size, coupled with a reduction in the numbers of females in the Sounds, due to fish changing sex to males earlier than under unfished conditions, is believed to result in the population being less productive as fewer recruits will be produced.

### Status of the Marlborough Sounds Blue Cod Populations

19. The Sounds is part of blue cod quota management area, BCO7 (Figure 2). The Ministry does not have specific information on the status of the BCO7 stock relative to the biomass level than can support the maximum sustainable yield. There is currently no information which indicates a stock-wide sustainability issue.

20. There is concern about localised depletion of blue cod in the Sounds. The best available information on these blue cod populations is provided by scientific surveys undertaken in 1995, 1996, 2001, 2004, 2007, 2008 and 2010. The Ministry notes that information from the 2010 survey is preliminary and the information should be considered with caution.

21. The surveys record information on abundance, sex ratio, size-at-maturity, size and age frequency and provide estimates of fishing mortality. The survey data is divided into nine strata (Figure 3), with a tenth stratum (Tory Channel) added in 2008 which will be included in future surveys:

- i. Inner Queen Charlotte Sound (IQCH);
- ii. Outer Queen Charlotte Sound (OQCH);
- iii. Extreme Outer Queen Charlotte Sound (EQCH);
- iv. Inner Pelorus Sound (IPEL);
- v. Middle Pelorus Sound (MPEL);
- vi. Outer Pelorus Sound (OPEL);
- vii. Extreme Outer Pelorus Sound (EOPE);
- viii. East D'Urville Island (DURE); and
- ix. West D'Urville Island (DURW; only surveyed since 2004).

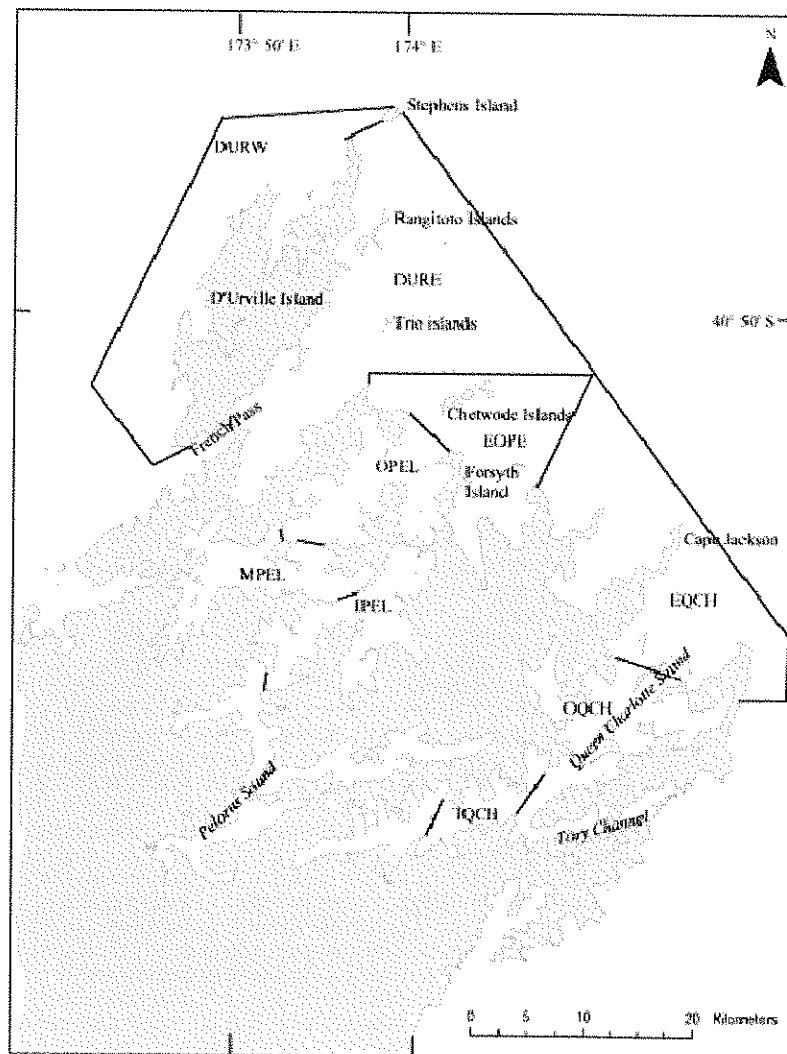


Figure 3 Survey strata of the Marlborough Sounds.

22. Between 1995/6 and 2004, adult blue cod biomass declined in all strata (not including West D'Urville Island which has only been surveyed since 2004). The estimated average

decline was 64%. From 2004 to 2007, adult biomass continued to decline or remained at low levels in the inner, middle and outer strata of both Queen Charlotte and Pelorus Sound. No blue cod (adults or pre-recruits) were recorded in 2007 in the inner Queen Charlotte Sound.

23. The preliminary 2010 survey information suggests that, since 2007, the inner, middle and outer strata of both Queen Charlotte and Pelorus Sound (i.e., the closed area) have shown improvement in adult blue cod biomass. In contrast, with the exception of the extreme outer Pelorus Sound stratum, strata outside of the closed area have shown a decline in adult abundance (Table 1).

**Table 1. Survey CPUE data (kg/hr) recruited blue cod ( $\geq 30$  cm) Marlborough Sounds 1995 to 2007.**

		1995	1996	2001	2004	2007	2010 <small>Preliminary results only</small>	Approx. % change 2007 to 2010	Approx. % change 1995/96 to 2010
Queen Charlotte Sound	Inner	0.54		0.3	0.21	0	0.48	↑	↓ 11
	Outer	1.16		0.55	0.33	0.19	2.18	↑ 1047	↑ 88
	Extreme Outer	2.52		1.08	1.08	1.91	1.48	↓ 23	↓ 41
Pelorus Sound	Inner		0.56	0.07	0.09	0.11	2.23	↑ 1927	↑ 298
	Middle		1.42	0.19	0.22	0.21	1.38	↑ 557	↓ 3
	Outer	1.62	1.95	0.31	0.47	0.46	3.55	↑ 672	↑ 119
	Extreme Outer	2.33	2.08	0.81	1.84	2.42	2.81	↑ 16	↑ 21
	D'Urville East		7.93	3.33	2.83	2.69	1.35	↓ 50	↓ 83
	D'Urville West				2.8	4.84	4.27	↓ 12	

24. In the closed area, the preliminary 2010 survey information suggests pre-recruit (blue cod < 30cm) biomass has remained at low levels or declined from 2007 to 2010 in all strata, with the exception of the inner and middle Pelorus Sound. Despite an increase in pre-recruit biomass in part of the Pelorus Sound, the 2010 survey suggests that since 1995/6, pre-recruit biomass in all strata has declined by between 33 and 83%. The low relative abundance indices of pre-recruits suggest poor recent recruitment for blue cod for the whole of the Sounds (Table 2).

25. Fishing effort can also affect population structure, such as the sex ratio and size distribution. In 2007, blue cod populations in all strata of the Sounds were dominated by male fish and the average size of male and female fish had decreased on average by 2.1 and 1.8 cm total length respectively from 1995/96 to 2007. Information on sex ratio and size distribution from the 2010 survey is not yet available. It is expected that it may take longer than 2-3 years for a shift in the size and sex distribution to be observed.



**Table 2. Survey CPUE data (kg/hr) pre-recruited blue cod (< 30cm) Marlborough Sounds 1995 to 2007**

		1995	1996	2001	2004	2007	2010	% change 2007 to 2010	% change 1995/96 to 2010
Queen Charlotte Sound	Inner	0.18		0.25	0.16	0	0.12	↑	↓ 33
	Outer	0.85		0.77	0.61	0.43	0.37	↓ 14	↓ 56
	Extreme Outer	0.6		0.72	0.96	0.67	0.38	↓ 43	↓ 37
Pelorus Sound	Inner		0.4	0.12	0.23	0.17	0.25	↑ 47	↓ 38
	Middle		1.33	0.33	0.26	0.18	0.22	↑ 22	↓ 83
	Outer	1.33	1.17	0.29	0.65	0.34	0.31	↓ 9	↓ 77
	Extreme Outer	1.19	0.72	0.64	1.19	0.77	0.71	↓ 8	↓ 40
	D'Urville East		1.98	2.79	1.85	0.67	0.79	↑ 18	↓ 60
	D'Urville West				1.23	0.89	1.37	54	

### The Marlborough Sounds Blue Cod Fishery

26. The Sounds blue cod fishery is part of the BCO7 quota management area. The Total Allowable Catch (TAC), Total Allowable Commercial Catch (TACC), and the allowances for recreational and customary fishing and for other sources of fishing-related mortality for BCO7 are outlined in Table 3.

**Table 3. BCO7 TAC, TACC and allowances (tonnes, t)**

Total Allowable Catch (TAC)	Total Allowable Commercial Catch (TACC)	Recreational Allowance	Customary Allowance	Fishing-related Mortality
343t	70t	177t	27t	69t

### Recreational Catch

27. Blue cod is consistently identified as the most important target finfish species by amateurs fishing in the Sounds. Blue cod is the second most frequently landed species by amateurs nationally and the most frequently landed species in the South Island.

28. Amateur fishers take the largest portion of the blue cod catch in BCO7 and it is estimated that about 80% of this catch is taken within the Sounds. Amateur catch is estimated using surveys as there is no reporting requirement. Surveys of amateur blue cod harvest in BCO7 are summarised in Table 4. All of the estimates are considered to carry a high level of uncertainty.

**Table 4. Estimates of blue cod harvest by amateur fishers**

Year	Area	Estimated Catch (t)	Data source
1991-1994	BCO7	165 - 250	Fishstock and survey, Teirney <i>et al.</i> 1997
1996	BCO7	220 - 260	National diary survey of recreational fishers, Bradford 1998
1999/2000	BCO7	230 - 347	National diary survey of recreational fishers, Boyd & Reilly 2002
1997/1998	Charter vessels in BCO7	76	National marine diary survey of recreational fishers from charter vessels, James & Unwin 2000
2004/2005	Marlborough Sounds	117 (5.2t from Inner & Middle Sounds and 111.8t from Outer & Extreme Outer Sounds)	Aerial flight survey, Davey <i>et al.</i> 2008
2008/2009*	Marlborough Sounds	104	Survey of recreational fishers, Batstone <i>et al.</i> 2009

\* Survey data collected in 2008/2009 but the estimate is for blue cod harvest prior to the closure.

29. Most amateur fishing occurs in summer months in the Sounds. Approximately 70% of fishers in the Sounds are active in December and January, whereas only around 50% are active in February and less than 40% are active the rest of the year. Approximately 60% of fishers in the Sounds during the peak summer months of December and January are non-residents.

30. Amateur fishers target blue cod using line fishing methods. Within the Sounds, amateur fishing effort for blue cod is concentrated mostly within shallow coastal waters. This coastal area only makes up a fraction of the total water body of the Sounds.

#### Commercial Catch

31. In 1995/6 the commercial catch of blue cod in BCO7 was restricted to a TACC of 70.005 tonnes (t) and since then commercial catch has ranged between 71 t and 28 t. In 2008/09 the commercial catch from BCO7 was 58 t.

32. Approximately 22 t of the 2008/09 commercial catch was taken in Statistical Area (SA) 017 (Figure 2), which includes most of the Sounds strata. From 2003/04 to 2009/10, the commercial catch of blue cod in SA 017 ranged from approximately 20 to 26 t and in the five years prior to 2003/04, from 15 to 17.5 t. The West D'Urville Island strata is in SA 038. In 2008/09 the commercial catch for SA 038 was approximately 15 t.

33. Most of the commercial catch of blue cod in the Sounds is taken using the potting method. Fishing is focussed around the extreme outer Sounds, particularly around D'Urville Island, Cook Strait, and Cape Campbell. A voluntary commercial code of practice exists for the Sounds that encourage commercial fishers not to target blue cod inside an area which starts just outside the current amateur closed area of the Sounds. Anecdotal evidence suggests that this code of practice has largely been adhered to.

#### Customary Catch

34. No quantitative information on historical or current Māori customary take is available. Bones found in middens suggest that blue cod was a significant species in the traditional Māori take. Blue cod remains an important kaimoana species for tangata whenua.

## Summary of Options

35. The Ministry proposes three options for your consideration. Option 1 (status quo) would keep the temporary closure in place until its regulated removal on 1 October 2012. Options 2 and 3 each propose a package of recommended and optional 'extra' management measures to support an earlier reopening date of 1 April 2011 (Table 5). Each package seeks to:

- a. Reduce amateur harvest to levels that may allow blue cod populations to grow;
- b. Protect spawning biomass and maintain reproductive output; and
- c. Protect pre-recruits to improve recruitment into the fishery.

Table 5. Summary of Options 2 and 3.

	Option 2	Option 3
Primary measures (recommended)	<p><b>Bag limit</b> Maximum of <b>one</b> blue cod per person per day</p> <p><b>Seasonal Opening*</b> 20 December – 31 August</p> <p><b>Size limits</b> Minimum legal size of 30cm Maximum legal size of 35cm</p> <p><b>Hook limit</b> Maximum of <b>two</b> hooks per line when fishing for any species.</p> <p><b>Accumulation limit</b> Personal Accumulation Limit of <b>two</b> daily bag limits (<b>two</b> blue cod)</p> <p><b>Filleting rule</b> Requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption.</p>	<p><b>Bag limit</b> Maximum of <b>two</b> blue cod per person per day</p> <p><b>Seasonal Opening*</b> 1 February – 31 August</p> <p><b>Size limits</b> Minimum legal size of 30cm Maximum legal size of 35cm</p> <p><b>Hook limit</b> Maximum of <b>two</b> hooks per line when fishing for any species</p> <p><b>Accumulation limit</b> Personal Accumulation Limit of <b>two</b> daily bag limits (<b>four</b> blue cod)</p> <p><b>Filleting rule</b> Requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption.</p>
Additional measures (optional)	<p><b>Management Area Expansion</b> Extend the current MSA (Figure 3).</p> <p><b>Maud island no take zone</b> Amateur fishers would be prohibited from taking all finfish species from a defined area around Maud Island.</p> <p><b>Challenger (East) Area</b> Extend application of v (accumulation limit) and vi (filleting rule) to Challenger (East) Area.</p>	<p><b>Management Area Expansion</b> Extend the current MSA (Figure 3).</p> <p><b>Maud island no take zone</b> Amateur fishers would be prohibited from taking all finfish species from a defined area around Maud Island</p> <p><b>Challenger (East) Area</b> Extend application of v (accumulation limit) and vi (filleting rule) to Challenger (East) Area.</p>

***\*Note that, in the first year, the fishing season would begin at the time of re-opening, which is 1 April 2011.***

36. For both Option 2 and 3, the primary measures would be applied to the MSA.

37. Under Option 2 and 3, the current regulation 4F (Marlborough Sounds blue cod restrictions) Fisheries (Challenger Area Amateur Fishing) Regulations 1986, which prevents blue cod being taken from the Marlborough Sounds amateur fishery, would be revoked. All options will, in any event, require amendments to be made to the existing regulatory restrictions pursuant to Section 297 (General Regulations) of the Fisheries Act 1996.

## Consultation

38. The Ministry released an Initial Position Paper (IPP) for public consultation on 23 August 2010 for a six week period. The IPP was published on the consultation section of the Ministry website and sent to persons and organisations with an interest in the fishery.

### Initial Position Paper

39. The IPP sought feedback on the management measures proposed in the BCMG's management plan for the Sounds amateur blue cod fishery. The measures were:

- i. Seasonal opening;
- ii. Maximum daily bag limit;
- iii. Minimum and maximum size limits;
- iv. Hook limit;
- v. Accumulation limit;
- vi. Maximum daily boat limit;
- vii. Possession of blue cod in whole or gutted state;
- viii. Extension to the Marlborough Sounds Area (MSA);
- ix. No-take zone for Maud Island;
- x. Introduction of an amateur fishing permit; and
- xi. Introduction of measures (a bag limit of two, an accumulation limit of two daily bag limits, a minimum legal size limit of 33cm and the requirement that blue cod be possessed in the whole or gutted state) to the Challenger (East) Area.

40. The Ministry also noted and sought feedback on alternative approaches to some of the measures.

### Submissions

41. The Ministry received 287 submissions on the IPP, including from:

- a. SeaFIC
- b. Soundfish
- c. Tasfish
- d. Te Tau Ihu Forum
- e. Ngāti Tama Manawhenua ki Te Tau Ihu Iwi Trust
- f. Marlborough Sounds Blue Cod Sustainability Society Inc.
- g. Affinity Charters Limited
- h. Pelorus Boating Club
- i. Te Ohu Kaimoana
- j. Wharehunga Enterprises Ltd.
- k. Wharehunga Trust
- l. Fitzgerald Cove Ltd.
- m. Challenger Finfisheries Management Co. Ltd.
- n. Holiday Parks Association and Tourism Industry Association
- o. 'Lady Karen' R&R Cruises
- p. Mana Cruising Club
- q. Marlborough Recreational Fishers Association
- r. New Zealand Underwater Association
- s. Okiwi Bay Ratepayers Association
- t. Pelorus Tours Ltd.
- u. New Zealand Recreational Fishing Council
- v. 265 submissions from individuals.

42. Copies of all submissions are available in Appendix 1.

43. All stakeholder groups, and the majority of individual submitters, generally agreed that new management measures were necessary to increase abundance of blue cod in the Sounds if the fishery is reopened.

## **Analysis of Options**

44. Both the Ministry and the BCMG consider a package of complimentary management measures is required to support re-opening the closed area to amateur fishing for blue cod, as previous approaches indicate a single or dual tool approach is unlikely to be effective. This section sets out the costs and benefits of two “packages” of measures (Options 2 and 3) as well as the status quo (Option 1).

45. All of the options presented are consistent with the purpose of the Act; in that they seek to provide for sustainable use of blue cod populations in the Sounds by amateur fishers.

46. An overview of the costs, benefits and key submission comments on each of the eleven individual measures (refer para 39) is provided in Appendix 2.

### Option 1 (Status Quo)

47. Under Option 1, the existing temporary closure would remain in place until the regulated closure period ends on 1 October 2012. The closure applies only to the hatched area shown in Figure 2. In the wider MSA area, the following regulations apply:

- a. a maximum bag limit of three blue cod per person per day;
- b. a MLS limit of 30cm (no MaxLS applies); and
- c. a requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption.

48. Preliminary information from the 2007 survey suggests that the closure has increased adult blue cod biomass in the closed area, but pre-recruit blue cod biomass appears to have remained low or declined. Option 1 is likely to result in blue cod abundance being higher when the fishery is re-opened on 1 October 2012, and to provide an opportunity to assess the status of pre-recruit populations in the Sounds. Higher abundance of adult and pre-recruit blue cod, by itself, will not ensure healthy blue cod populations or reduce the risk of future depletion, however. Whether or not blue cod populations remain healthy after the reopening depends on the management measures put in place to managing fishing impacts on the blue cod populations. The Ministry recommends that, if you choose Option 1, you also chose a management package (ie. either Option 2 or 3) to be introduced by the opening date of 1 October 2012.

49. The 2010 survey also suggests that blue cod biomass in most strata adjacent to the closure has decreased, most probably due to displaced fishing effort since the closure. Retention of the closure under Option 1 is likely result in further depletion in these areas.

50. Option 1 delays realisation of any utilisation benefits for amateur fishers. It may also increase risks of localised depletion occurring in areas of the MSA outside the closed area due to fishing effort displaced by the closure.

## Option 2

51. Under Option 2, the fishery would be reopened on 1 April 2011 with the following management measures in place:

- i. A maximum bag limit of one blue cod per person per day;
- ii. A seasonal opening from 20 December – 31 August (note, in first year season would begin when fishery opened on 1 April);
- iii. A minimum legal size limit (MLS) of 30cm and maximum legal size limit (MaxLS) of 35cm ("slot limit");
- iv. A hook limit of two hooks per line when fishing for any species;
- v. A personal accumulation limit of two daily bag limits; and
- vi. A requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption.

52. Under Option 2, the measures would be implemented over the area defined as the MSA (Figure 1), rather than just to the area currently closed.

### Benefits

53. Option 2 provides for some access to the Sounds blue cod fishery by amateur fishers 18 months earlier than the currently schedule reopening date. The Ministry considers this combination of management measures most likely to allow local blue cod populations in the Sounds to increase while allowing for some utilisation by amateur fishers. The measures proposed are complimentary and important in the following ways:

- a. The one-cod bag limit is the most effective means of achieving a significant catch reduction, noting that
  - Three years after introduction of a three-cod bag limit in 2003, blue cod populations in the Sounds continued to decline and had reduced on average by 25%. Catches therefore need to be less than those that occurred before the closure for fishing to be more sustainable. Information on amateur catch is unreliable but best available information suggests a two-cod bag limit might reduce amateur catch about 13% and a one-cod bag limit might reduce catch about 54%.
  - Preliminary information from the 2010 survey indicates that, since the closure was implemented, adult blue cod biomass has increased in the areas closed to fishing while pre-recruit biomass has remained low or declined. To allow blue cod populations to continue to increase while still allowing fishing, the required catch reductions will likely need to be significant.
- b. The accumulation limit compliments the bag limit, supporting a reduction in catches, and promoting good stewardship by embedding the "fish for a feed not the freezer" principle.
- c. As noted, pre-recruit blue cod populations are still low or declining. The closed season and slot limits work together to support reproductive output by protecting spawning fish and attempt to achieve a more balanced population structure. The slot limits chosen ensure:
  - Fish are able to breed before being available for harvest;
  - Larger and more fecund fish are protected;
  - A natural sex ratio by increasing the large male population to suppress female to male sex change and;

- Incentives to high-grade fish are minimised.
- d. A seasonal closure over the core spawning season compliments the slot limit by reducing disruption to spawning behaviour.
  - e. The two-hook limit both supports the bag limit and reduces risks associated with incidental mortality by reducing the incidence of multiple blue cod simultaneously taking the hook.
  - f. The requirement to possess cod in the whole or gutted state enables Ministry officers to effectively monitor and enforce the size limits.
  - g. Blue cod populations have declined in most parts of the MSA outside the closed area. Application of the measures to the MSA may assist to halt the decline and rebuild the populations. Applying the measures to the MSA would also reduce the number of different rules applying to the amateur harvest of blue cod in BCO7, making the rules easier for fishers to remember and simpler for Ministry officers to enforce

54. A key feature of Option 2 is that it seeks to balance the need to allow for amateur catch while aiming to provide an increase in blue cod abundance. It does this by setting a very low bag limit but keeping the fishery open during the peak amateur fishing season (December and January). Consequently, the benefit per fisher per day is small (i.e. one blue cod) but the number of fishers receiving benefit is large.

55. Submissions indicate there is likely to be a high level of stakeholder support for the measures, except the one-cod bag limit which was not consulted on. However, a low level of support for this bag limit is expected. The risk associated with having a low level of support for the bag limit is that voluntary compliance levels are low and therefore the effectiveness of the measure is reduced. If you choose Option 2, the Ministry recommends that any information distributed on the new measures emphasises that management measures like the bag limit would be adjusted once sufficient increases in both pre-recruit and adult populations were achieved.

## Costs

56. The key impacts of the proposed measures are:

- a. The measures would decrease amateur fishing access in areas of the MSA outside the current closure (Figure 1). For example, the bag limit would reduce from three to one, the area would be closed to blue cod fishing for part of the year and the MLS of 33 cm would be replaced with a slot limit of 30-35cm. Application of the accumulation limit may also make travelling to the most Extreme Outer areas for multiple-day fishing trips less worthwhile.
- b. In general, the average size of blue cod increases from the Inner Sounds to the MSA boundary. The 30-35cm slot limit may therefore be more constraining in Outer Sounds areas, as more large fish may be caught and have to be released.
- c. Some submitters expressed concern about high-grading catch. High grading may increase overall fishing-related mortality.
- d. A hook limit of two hooks per line may restrict fishers fishing in the MSA from efficiently accessing other species like hāpuka and snapper. Also, much of the hook gear manufactured and sold for blue species like cod and snapper is three hooks per line.
- e. Monitoring and securing compliance with the new rules may be difficult because the Sounds is characterised by large numbers of boat fishers transiting to and from a wide range of locations (e.g., Wellington, Tasman and Golden Bays, and

Christchurch) on day or multi-day trips, and these fishers pass through areas with different blue cod harvesting rules to those applying in the Sounds.

- f. Some charter operators expressed concern about not being able to fillet customers' fish as many did not have filleting facilities at their accommodation.

57. Declining blue cod biomass in the extreme outer Sound strata indicates application of these measures to the whole MSA is warranted and timely (Tables 1 and 2).

58. The risk of high levels of incidental mortality resulting from high-grading or returning non-legal cod to sea is mitigated by the narrow slot limit and the two-hook limit, which act to minimise incentives to high grade and reduce the number of fish hooked, respectively. In addition, a voluntary Code of Practice put in place by the BCMG promotes fishing practices, hook types and sizes, and handling practices that improve the survival rates of returned fish. The Code is supported by a "Which Hook?" poster developed by the Ministry.

59. The impact of the introduction of the measures, in particular the hook limit, on other amateur fisheries is not accurately known at this time. A survey of amateur fishers indicated that around 60% of fishers target snapper within the Sounds, but only 14% of amateur fishers use long lines. Hāpuka is estimated to be around the sixth most popular fish to target within the Sounds and anecdotal evidence suggests hāpuka is frequently targeted using a drop line with more than two hooks. A hook limit is, however, simple to understand and memorise, and the high level of buy-in indicated in submissions for this measure indicates voluntary compliance levels are likely to be high.

60. Risks to enforcement can be managed by requiring that amateur fishers in the MSA cannot possess more blue cod than specified by the daily bag limit or accumulation limit, cannot possess blue cod outside the legal size limits and blue cod must be in the gutted or whole state, even if the cod were caught in locations outside the MSA. This will be constraining to fishers departing from on the MSA to fish outside of the area, particularly under option 2 as fishers will not be able to transit more than one blue cod per day, or a total of two blue cod from multiple days fishing through the MSA.

61. The requirement to possess cod in the whole or gutted state would not prevent charter boats from offering a filleting service but they may have to adjust their practices so that fish are landed in the whole state and are only filleted after docking if being taken back to accommodation for eating.

#### Additional Measures to Consider

62. Under Option 2, you are also being asked to consider the following additional measures:

- a. An extension to the MSA (Figure 1), which would mean the proposed measures would also apply to western D'Urville Island, the Brothers Islands and Port Underwood areas. The extension would reduce any long-term risk of over fishing in the most outer regions of the Sounds due to effort being transferred away from the MSA (because of the stricter rules), and would be easier for Ministry officers to enforce. Strong opposition to the extension was expressed in submissions; submitters considered there was no evidence additional constraints were needed in the extension areas and that rougher conditions acted to naturally limit fishing effort in the areas. Low buy-in for the expansion from the amateur fishing community may decrease the effectiveness of the overall package of measures. The extension might also increase tension between amateur fishers and the commercial sector, as the extended area encompasses a greater number of areas where commercial fishers target blue cod.



- b. A no take zone around Maud Island, which would provide an opportunity to monitor changes in the abundance and population structure of blue cod with removal of amateur fishing effort and may also benefit abundance the local populations within the rest of the Sounds via the transfer of adults, eggs and larvae. MFish notes that a no-take zone would not affect tangata whenua rights to harvest under customary permits. If tangata whenua were to harvest in the no-take zone, the value of the area as a monitoring site may be compromised.
- c. Introducing the requirement to possess blue cod whole or gutted and the accumulation limit (two daily bag limits) to the Challenger (East) Area, would reduce any long-term risk of over fishing in area due to effort being transferred away from the MSA, and would aid Ministry officers in monitoring and enforcing the bag limit and minimum legal size limit. As targeted commercial fishing for blue cod occurs in Challenger (East) Area, outside of the MSA, the introduction of stricter measures to regulate amateur fishing effort within this area may cause tension between amateur and commercial fishing sectors.

63. The Ministry considers that none of the additional measures are required to rebuild populations known to be depleted or over fished, but each does confer additional benefits.

### Option 3

64. Under Option 3, the fishery would be reopened on 1 April 2011 with the following management measures in place:

- i. A maximum bag limit of two blue cod per person per day;
- ii. A seasonal opening from 1 February – 31 August (note, in the first year the fishing season would begin when fishery opened on 1 April);
- iii. A minimum legal size limit (MLS) of 30cm and maximum legal size limit (MaxLS) of 35cm ("slot limit");
- iv. A hook limit of two hooks per line when fishing for any species;
- v. A personal accumulation limit of two daily bag limits; and
- vi. A requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption.

65. Under Option 3, the measures would be implemented over the area defined as the MSA (Figure 1), rather than just to the area currently closed. Declining blue cod biomass in the extreme outer Sound strata indicates application of measures to the whole MSA is warranted and timely (Tables 1 and 2).

### Benefits

66. Option 3 confers most of the same benefits as Option 2. The key difference between Option 2 and 3 is the balance between the need to reduce amateur catch to levels that will ensure blue cod populations continue to increase with the desire to provide maximum benefits to amateur fishers possible. Option 3 seeks to do this using a slightly higher bag limit (two cod per person per day) and a shorter open season by closing the fishery during the peak amateur fishing months of December and January. Therefore, under Option 3, the opportunity to obtain benefit per fisher per day is slightly larger (i.e., two blue cod) but the number of fishers able to receive benefit may be smaller because the fishery would be closed during the period when most amateur fishers are active and/or visiting the area.

67. The Ministry considers Option 3 may have a higher risk of not achieving an increase in blue cod biomass, as some fishers that previously fished in December and January may transfer their effort to the new open season.

68. Submissions indicate there is likely to be a high level of stakeholder support for the measures, with the exception of the dates for the seasonal opening. The majority of submitters supported a seasonal closure over the core spawning season as they considered it important to protect spawning activity, but did not support the fishery being closed during December and January, as these were the most popular fishing months.

## Costs

69. Option 3 has mostly the same costs as Option 2, with the following differences:

- a. The decrease in amateur fishing access to blue cod in areas of the MSA outside the current closure (Figure 1) would comprise a lesser reduction in bag limit (from three to two), but a longer time period when the area was closed to fishing for blue cod, including the peak summer months of December and January.
- b. Submitters involved with local businesses noted that a closure over summer months would restrict the level of economic benefit that they could gain from the fishery being reopened.

70. The Ministry has no quantitative information on the potential impact on local businesses but acknowledges that fishing related businesses, such as charter boat operators and businesses selling fishing rods, tackle and bait, are likely to be impacted in summer months as blue cod is the species most frequently targeted by amateur fishers. In the medium, a portion of the lost transactions may be transferred to other times of year.

## Additional Measures to Consider

71. As with Option 2, you may also wish to consider the additional measures:

- a. An extension to the MSA (Figure 1). This measure may be considered more necessary under Option 3 than Option 2, as more amateur fishing effort may be transferred to areas not covered by the new measures as a result of the blue cod fishery being closed during December and January when the highest number of amateur fishers are active.
- b. A no take area around Maud Island. This is considered to have the same costs and benefits as Option 2.
- c. Introducing the possession rule and the accumulation limit to the Challenger (East) Area. This is considered to have the same or similar costs and benefits as Option 2 (neither option affects the current bag limit of three or MLS of 30cm for the Challenger (East) Area).

## Other Matters

### Measures Consulted on but not Included in the Packages

72. Not all the measures discussed in the IPP are represented in the options outlined above. The measures not included (and why) are as follows:

- a. A maximum daily boat limit: A high level of opposition to a boat limit was evident in submissions and this kind of rule is difficult to enforce. These two characteristics would likely reduce the effectiveness of the rule and may also impact on support for the overall package of measures.

- b. An amateur fishing permit: Submissions indicated a very low level of support for this measure which may compromise the benefits that a permit can provide. Also, it is unlikely that introducing a scheme for a single species in a localised area would be cost-effective.
- c. A minimum legal size limit of 33cm and a bag limit of two and for the Challenger (East) Area: Given the proposed slot limit of 30 – 35cm for the MSA in both packages, as it is not considered appropriate to raise the MLS to 33cm in the adjacent area it would be confusing for fishers. Option 2 proposes a bag limit of one and a change to the bag limit in this area to a different number of fish than proposed for the MSA may also be confusing for fishers.

### General Matters in submissions

73. Some submitters expressed concern that damage to the benthic habitat caused by deforestation, commercial trawling, marine farming and boat pollution may be having a large negative impact on blue cod populations. The Ministry considers the most significant influence on blue cod populations in the Sounds to be fishing pressure, while land-based activities (i.e. changes in land-use and forestry effects) and other marine-based activities (i.e. marine farming, and tourism) are also likely to contribute to the current state of the fishery. Trawling and marine farming activities occur only in some parts of the Sounds. For example, trawling is prohibited in Queen Charlotte Sound and restricted in Pelorus Sound, and very little marine farming occurs in Queen Charlotte Sound. The Ministry is working with authorities responsible for managing land based activities to make them aware of their potential impacts on fish stock health.

74. Some submitters expressed concern about the level of commercial and customary fishing for blue cod within the Sounds. There was a strong view that if recreational fishers are making concessions to allow recovery of the blue cod populations then commercial and customary fishers should do so also. The largest extractor of blue cod from BCO7 and the Sounds is the amateur sector. The purpose of this review is to more effectively manage amateur fishing effort in the Sounds to achieve an increase blue cod abundance. Fishing effort by other sectors will be monitored. If commercial effort increases significantly, the Ministry may progress measures to manage the effort.

### **Conclusions**

75. The temporary closure appears to have increased adult blue cod biomass in the closed area. Pre-recruit blue cod biomass has remained low or continued to decline in most strata, however. Without detailed analyses of the survey data we can only speculate about the absence of an increase in pre-recruit blue cod biomass, possible reasons could be:

- a. Spawner biomass has not grow sufficiently to impact pre-recruit recruitment;
- b. Newly settled pre-recruits have not growing enough to be susceptible to the survey gear; and
- c. An as yet unknown environmental factor is suppressing pre-recruit survival.

76. The Ministry therefore considers any reopening of the areas to amateur fishing for blue cod should be undertaken cautiously. All three proposed options are cautious. Option 1 retains the closure to allow time for further increases in adult blue cod biomass, and for pre-recruit biomass to begin increasing. Options 2 and 3 provide for low levels of amateur utilisation – which are thought likely to allow blue cod numbers to increase – and puts in place measures to assist reproductive output.

77. The key difference between Option 2 and 3 is the balance between the need to reduce amateur catch to levels that will ensure blue cod populations continue to increase with the desire to provide the maximum benefits to amateur fishers possible. Option 2 sets a very low daily bag limit (one cod per person) but keeps the fishery open during the peak amateur fishing season (December and January). Consequently, the opportunity to gain benefit per fisher per day is small (ie, one blue cod) but the number of fishers receiving benefit is large. Option 3 sets a slightly higher daily bag limit (two cod per person) and closes the fishery during the peak amateur fishing months of December and January. Under Option 3, the benefit per fisher per day is slightly larger (ie, two blue cod) but the number of fishers receiving benefit is smaller.

78. The Ministry considers Option 2 the best option because it:

- a. Provides some access, and therefore benefits, to amateur fishers earlier than Option 1;
- b. Would probably manage amateur catch to a level that allows blue cod populations within the Sounds to grow; and
- c. Is more secure than Option 3, as more of the fishing effort that might otherwise have occurred in the proposed closed period may transfer to the open season.

79. The Ministry notes that, no matter which option you choose, ongoing monitoring of the Sounds blue cod populations will inform future adjustments to measures to provide for more or less or different amateur utilisation in the future to ensure blue cod populations in the Sounds remain healthy and provide benefits to amateur fishers.

80. Regarding the additional measures:

- i. The Ministry does not recommend you extend the MSA boundaries at this time. The available information has not yet confirmed that depletion is occurring in the areas covered by the extension and there is strong opposition to the extension.
- ii. The Ministry considers a no take zone around Maud Island would be beneficial and there is a high level of support for the measure. The Ministry notes the no-take zone would not affect tangata whenua rights to harvest under customary permits, which may reduce its effectiveness, but notes that tangata whenua's initial views on the measure were positive and they may choose to support the measure. The Ministry recommends that you implement a no take zone around Maud Island.
- iii. The Ministry recommends that you require amateur fishers to possess cod whole or gutted as this would assist Ministry officers in monitoring and enforcing the bag limit and minimum legal size limit in the Challenger (East) Area.
- iv. The Ministry does not recommend you adopt the accumulation limit of two daily bag limits in the Challenger (East) Area. It is unclear what benefit the accumulation limit would provide to blue cod populations in the area and the introduction of stricter measures to regulate amateur fishing effort within this area may cause tension between amateur and commercial fishing sectors.

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- i. The Ministry does not recommend you extend the MSA boundaries at this time. The available information has not yet confirmed that depletion is occurring in the areas covered by the extension and there is strong opposition to the extension.
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- iii. The Ministry recommends that you require amateur fishers to possess cod whole or gutted as this would assist Ministry officers in monitoring and enforcing the bag limit and minimum legal size limit in the Challenger (East) Area.
- iv. The Ministry does not recommend you adopt the accumulation limit of two daily bag limits in the Challenger (East) Area. It is unclear what benefit the accumulation limit would provide to blue cod populations in the area and the introduction of stricter measures to regulate amateur fishing effort within this area may cause tension between amateur and commercial fishing sectors.

## 81. Summary of Recommendations

The Ministry recommends that you either:

### Option 1

- i. **Retain** the closure of parts of the Marlborough Sounds to amateur blue cod fishing Yes / No

### AND EITHER

- ii. **Agree** to recommend the making of regulations as set out in **Option 2** for implementation on 1 October 2012 Yes / No

### OR

- iii. **Agree** to recommend the making of regulations as set out in **Option 3** for implementation on 1 October 2012 Yes / No

### OR Option 2 (Ministry's preferred option)

- i. **Agree** to reopen the parts of the Marlborough Sounds currently closed to amateur blue cod fishing on 1 April 2011 Yes / No

### AND

- ii. **Agree** to recommend the making of the following amateur fishing regulations to apply to the MSA from 1 April 2011:
- A daily bag limit of ~~one~~<sup>two</sup> blue cod per person Yes / No
  - A seasonal opening from 20 December – 31 August Yes / No
  - A minimum legal size limit (MLS) of 30cm and maximum legal size limit (MaxLS) of 35cm Yes / No
  - A maximum of two hooks per line when fishing for any species Yes / No
  - A personal accumulation limit of ~~two~~<sup>one</sup> daily bag limits Yes / No
  - A requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption Yes / No

### AND

- iii. **Extend** the boundaries of the MSA as per Figure 1 Yes (No)

### AND

- iv. **Agree** to introduce a no take zone for Maud Island Yes / No

### AND

- v. **Agree** to introduce a requirement for amateurs to possess blue cod in the whole or gutted state, unless for immediate personal consumption, to the Challenger (East) Area Yes / No

### AND

- vi. **Agree** to introduce a personal accumulation limit of two daily bag limits to the Challenger (East) Area Yes / No

**OR Option 3**

- i. **Agree** to reopen the parts of the Marlborough Sounds currently closed to amateur blue cod fishing on 1 April 2011 Yes / No

**AND**

- i. **Agree** to recommend the making of the following amateur fishing regulations to apply to the MSA from 1 April 2011:
- A daily bag limit of two blue cod per person; Yes / No
  - A seasonal opening from 1 February – 31 August Yes / No
  - A minimum legal size limit (MLS) of 30cm and maximum legal size limit (MaxLS) of 35cm Yes / No
  - A hook limit of two hooks per line when fishing for any species Yes / No
  - A personal accumulation limit of two daily bag limits Yes / No
  - A requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption Yes / No

**AND**

- ii. **Extend** the boundaries of the MSA as per Figure 1 Yes / No

**AND**

- iii. **Agree** to introduce a no take zone for Maud Island Yes / No

**AND**

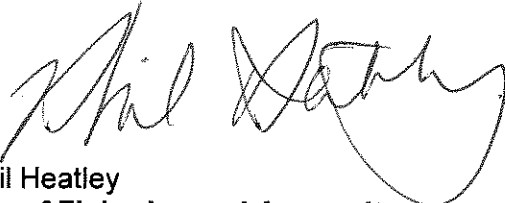
- iv. **Agree** to introduce a requirement for amateurs to possess blue cod in a whole or gutted state only, unless for immediate personal consumption, to the Challenger (East) Area Yes / No

**AND**

- v. **Agree** to introduce a personal accumulation limit of two daily bag limits to the Challenger (East) Area Yes / No

  
Steve Halley  
for Chief Executive

~~AGREED / AGREED AS AMENDED / NOT AGREED~~

  
Hon Phil Heatley  
Minister of Fisheries and Aquaculture

17/11/2010

## Appendix 1: IPP and Submissions (separate document)

### Appendix 2: Discussion of Individual Measures

82. The IPP considered the following eleven individual management measures:

- i. Seasonal opening;
- ii. Maximum daily bag limit;
- iii. Minimum and maximum size limits;
- iv. Hook limit;
- v. Accumulation limit;
- vi. Maximum daily boat limit;
- vii. Requirement that blue cod be possessed in whole or gutted state;
- viii. Extension to the MSA;
- ix. No-take zone around Maud Island;
- x. Introduction of an amateur fishing permit; and
- xi. Application of the accumulation limit and the requirement that blue cod be possessed in the whole or gutted state to the Challenger (East) Area.

#### (i) Seasonal Opening

83. Blue cod have an annual reproductive cycle with an extended spawning season from late winter to late spring. Closing the amateur fishery over the spawning period may support reproduction by reducing disruption to spawning behaviour. However, there is no quantitative information to inform the level of enhancement that might be provided to blue cod populations.

84. Closing the fishery in popular fishing months is likely to also reduce amateur harvest of blue cod. Approximately 70% of fishers are active in December and January, whereas only around 50% are active in February and less than 40% are active the rest of the year. Estimating how much effort would be removed by closing the fishery at certain times of year and how much would be transferred to other times of the year is difficult. A survey of amateur fishers in the Marlborough Sounds estimated that approximately 30% of fishers stayed at their usual residential location when fishing. This sector of fishers may be considered more able to shift their effort outside of the peak summer months of December and January. The remaining 70% predominantly stayed in holiday homes or "baches". These fishers may be able to shift their effort also, but may be more restricted in how frequently they can access the fishery outside of the peak summer months.

85. The IPP proposed two fishing season options:

- a. 1 February to 31 August (ie, close the fishery over the core spawning period and the peak amateur fishing months of December and January); or
- b. 1 January to 31 August (ie, close the fishery over the core spawning period only).

86. The majority of submitters supported a seasonal closure over the core spawning season as they considered it important to protect spawning activity, but did not support the fishery being closed during December and January, as these were the most popular fishing months. Approximately a third of submitters objected to a seasonal opening at any time, considering it unfair to restrict access in this way. Submitters involved with local businesses



suggested that a closure over summer months would restrict the level of economic benefit that they could gain from the fishery being reopened.

#### (ii) Maximum Daily Bag Limit

87. The proposed amateur daily bag limit of two blue cod would restrict amateur fishers to taking a maximum number of blue cod per person per day when fishing in the Marlborough Sounds and Challenger (East) areas. Amateur fishers located in the management area (i.e., the area to which management measures are introduced) would also not be allowed to be in possession of more than the daily bag limit for a single days fishing, regardless of where the blue cod was caught. This measure supports compliance as there are likely to be a high number of fishers transiting fish through the MSA from other areas and this measure ensures that the daily bag limit of amateur fishers can be monitored effectively.

88. The pre-closure bag limit was three blue cod per person per day. The three cod bag limit was introduced in 2003. Research suggests that biomass in the Sounds strata declined on average by approximately 25% from 2004 to 2008. If blue cod populations are to increase after reopening, then amateur blue cod harvest will need to be constrained to a level lower than that occurring prior to the closure.

89. The average catch of blue cod per fisher prior to the closure was estimated to be 1.95 fish per trip. Using estimates of average catch, a bag limit of two can be estimated to reduce catch by approximately 13%, if applied to the whole Sounds region. A bag limit of one is estimated to reduce catch by approximately 54%. These estimates of average catch are highly uncertain, however, and have a high level of error associated with them.

90. The IPP proposed a bag limit of two blue cod per person per day. The majority of submitters supported a two cod bag limit. However several submitters considered a bag limit of two as overly restrictive. Some stakeholders expressed a view that a bag limit less than two would result in low buy-in from the amateur fishing community and reduce utilisation benefits to a level that is unacceptable.

91. Some submitters expressed concern about high-grading of landed catch. High-grading is when a fisher catches a small fish (above the MLS), then discards it to retain a larger one caught later. High grading increases overall fishing mortality. Research has shown that if fish are handled correctly and caught using large hooks, then their chance of survival if returned to sea immediately is high. A small scale experiment showed that returned, undersized fish caught with small hooks (size 1/0) experience 25% mortality, whereas those caught with large hooks (size 6/0) appear to have little or no mortality (Carbines 1999).

92. A voluntary Code of Practice put in place by the BCMG and a "Which Hook?" educational poster promote fishing practices, hook types and sizes, and handling practices that improve the survival rates of returned fish and therefore mitigates risks associated with high grading. The introduction of a narrow slot limit and a hook limit may also assist to reduce incentives and need to high grade (refer later sections).

#### (iii) Minimum and Maximum Size Limits ("Slot Limit")

93. This regulation would prevent amateur fishers from being able to harvest blue cod outside of the legal slot limit and/or be in possession of blue cod outside of the legal slot limit while in the MSA. Due to the high number of fishers that are believed to transit fish through the MSA, the requirement for fishers not to possess fish outside of the slot limit while inside the MSA is necessary to ensure compliance can be monitored effectively.

94. A minimum legal size (MLS) limit can protect pre-recruits and, when set at the right level, ensure fish have an opportunity to spawn prior to harvest. A maximum legal size (MaxLS) limit can support reproductive output by preventing the harvest of larger, more fecund fish and by assisting the establishment of a balanced sex ratio. Depleted blue cod populations in the Sounds are generally comprised of smaller fish and are male-dominated. The presence of large dominant males is expected to help suppress females from changing sex and from changing sex at a smaller size, however this hypothesis has yet to be tested for blue cod.

95. The IPP suggested the following slot limits:

- a. 33 – 45cm
- b. 30 – 35cm
- c. 33 – 40cm
- d. 33 – 45cm

96. A MaxLS of 40cm or 45cm is likely to be ineffective at supporting reproductive output as size frequency data suggests that only a small number of blue cod are larger than 40cm and these fish are almost entirely male (Figure 4).

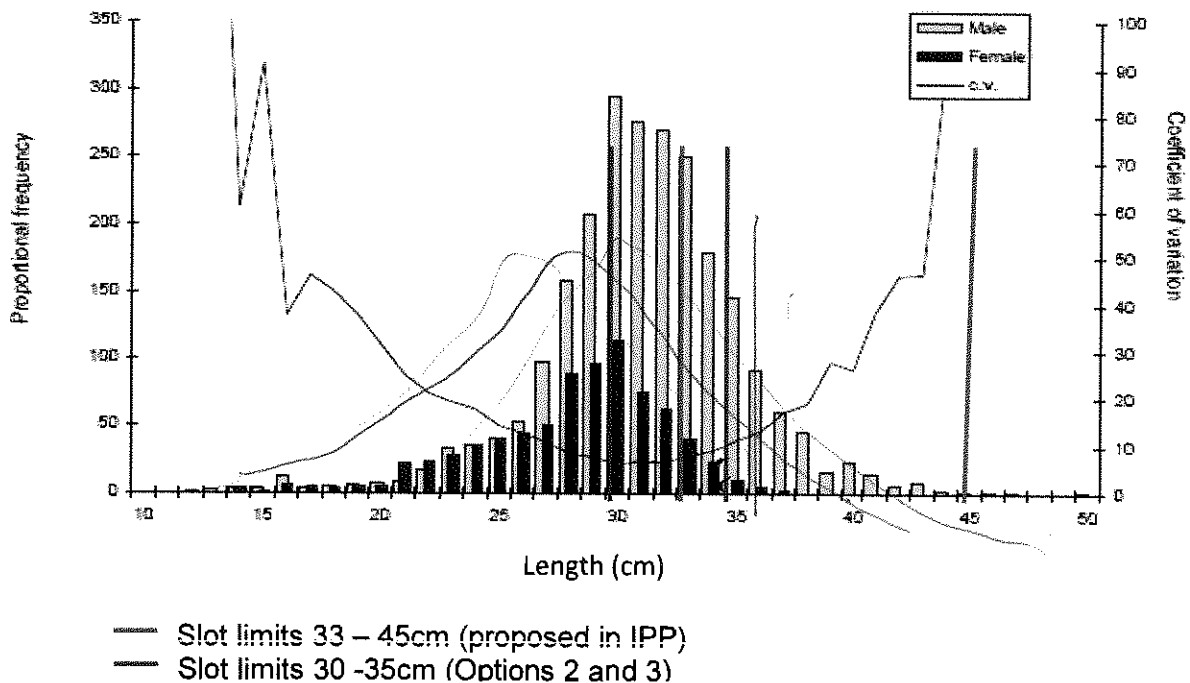


Figure 4 Size-frequency distributions for blue cod sampled from all strata sampled during a 2007 survey.

97. While the majority of submitters supported the introduction of a MLS and a MaxLS, some submitters suggested the MaxLS is overly constraining. Several submitters also expressed concern that a slot limit would result in higher levels of incidental mortality, as fish released back into the water have only a low chance of survival. Some submitters suggest that adult fish especially would have a high rate of mortality following release as they tend to swallow the hook which can result in fatal wounding to the gut. As noted above, the BCMG voluntary Code of Practice promotes fishing practices, hook types (including circle hooks which reduce hook swallowing by adult fish) and sizes, and handling practices that improve the survival rates of returned fish and therefore mitigates risks associated with returning fish.

98. Several submitters also expressed concern that a slot limit may encourage high-grading. Choosing a narrower slot limit, for example from 30 to 35cm, would act to disincentivise high-grading, which would further reduce risks associated with high grading.

#### (iv) Hook Limit

99. Blue cod take a hook easily and it is not unusual to catch multiple blue cod simultaneously on a line with multiple hooks. A hook limit can assist to reduce the number of fish hooked at any one time and therefore reduce incidental mortality.

100. The IPP proposed a maximum of either one or two hooks per line when fishing for any species. The majority of submissions that commented on this measure supported the introduction of a two hook limit and considered that a limit of two hooks would not restrict the ability of fishers to catch their bag limit of blue cod. Some submitters supported a two hook limit only for the current closed area and suggested this measure should only apply to handheld lines if introduced outside the closure (i.e., fishers could still use long lines and drop lines) to prevent impacts on fishers targeting species like snapper and grouper. Some submitters suggested that this measure should be included in the voluntary code of practice but should not become a regulation as it is too hard to enforce.

101. A restriction of one or two hooks per line does not prevent amateur fishers from targeting other popular species but may reduce fishing efficiency. The impact the introduction of this measure may have on other amateur fisheries is not accurately known at this time. A survey of amateur fishers indicated that around 60% of fishers target snapper within the Sounds, but only 14% of amateur fishers use long lines. Hāpuka is estimated to be around the sixth most popular fish to target within the Sounds and anecdotal evidence suggests hāpuka is frequently targeted using a drop line with more than two hooks.

102. Non-compliance can be difficult to monitor for this type of measure, as the restriction only applies to fishing equipment that is in current use (possessing more hooks than the hook limit is allowed). However, a hook limit is simple to understand and memorise, and the high level of buy-in indicated in submissions for this measure indicates voluntary compliance levels are likely to be high.

#### (v) Accumulation Limit

103. An accumulation limit restricts amateur fishers from possessing more than a specified maximum number blue cod at any time. An accumulation limit can be used to support the fishery management objective of reducing amateur catch. This measure supports compliance as there are likely to be a high number of fishers transiting fish through the MSA from other areas and this measure ensures that all amateur fishers must only possess a maximum of two daily bag limits of blue cod, regardless of where they were fishing. Without this possession rule compliance cannot be effectively monitored.

104. Anecdotal evidence suggests that non-resident fishers may apply greater fishing effort during visits to the Sounds in order to harvest blue cod to store for future consumption. As approximately 50 - 60% of fishers in the Sounds during the peak summer months are non-residents, fishing effort for accumulation purposes may significantly contribute to harvest, particularly during the summer period. However, there is no quantitative information to estimate how much an accumulation limit may reduce amateur catch by.

105. The IPP proposed a personal accumulation limit of two daily bag limits of blue cod. The majority of submitters who commented on this measure supported its introduction. Some submitters, including some charter operators, opposed introducing the accumulation

limit to the proposed extension of the MSA (refer measure (viii)), considering it would make travelling to the most Extreme Outer areas for multiple-day fishing trips far less worthwhile.

106. Monitoring non-compliance with an accumulation limit can be difficult if people are storing cod in private property, such as holiday homes. However the support expressed in submissions suggests voluntary compliance levels are likely to be high.

#### (vi) Possession of Blue Cod in Whole or Gutted State

107. The IPP proposed a requirement for amateur fishers to possess blue cod in a whole or gutted state only, unless for immediate personal consumption. Fishers would be allowed to fillet fish if they are to be consumed immediately either on board a vessel or on coastal land. Requiring fishers to possess blue cod in a whole or gutted state would make it possible to monitor and ensure compliance with the proposed slot limit.

108. Most submitters supported this measure and the rationale underlying it. However, a number of submitters questioned the need for this measure, suggesting that compliance to size regulations could be assessed by measuring fillets or by measuring fish frames. The use of fillets or fish frames to regulate size limits can be unreliable and is likely to lead to problems for Ministry officers monitoring compliance.

109. Several charter boat operators noted that many of their customers do not have facilities to fillet fish on land and that filleting of customers' fish is expected. The measure would not prevent charter boats from offering a filleting service but they may have to adjust their practices so that fish are landed in the whole state and only filleted if being taken back to accommodation for eating.

110. A few submitters expressed concern about fish waste being dumped in marinas and off wharves. The Marlborough District Council is responsible for controlling dumping of waste from vessels and offshore installations through the Resource Management (Marine Pollution) Regulations 1998 developed under sections 15A, 15B and 15C of the Act.

#### (vii) Maximum Daily Boat Limit

111. A boat limit restricts all persons fishing from a single vessel from jointly possessing more than a set number of blue cod per day regardless of the number of people on board or where the fish were caught. A boat limit can reduce concentrated fishing effort over small areas and therefore reduce risks of localised depletion occurring.

112. Information collected on charter vessels indicated 38 charter boat companies operated a total of 48 vessels within the Sounds and carried from 4 – 50 passengers, with 70% of vessels recording they take 10 or more day passengers. This data was supplied voluntarily and has not been verified as accurate or complete.

113. The IPP suggested a daily boat limit of 10 blue cod per vessel. Of those submissions that commented on this measure, approximately 56% of submitters expressed support for the measure. Opposing submissions considered the measure was discriminatory towards fishers who could not afford a private boat and/or were mobility limited (such as pensioners). Some charter boat operators submitted that, if this measure was implemented across the proposed extended MSA, it would make charter boat business uneconomical.

114. Several submitters noted this measure would be hard to enforce as it would be unclear who on the boat would be held responsible if the limit was breached. The Ministry confirms that the measure is difficult to enforce in the low support expressed in submissions means buy-in, and therefore voluntary compliance, may be low.

#### (viii) Extension to the Marlborough Sounds Area (MSA)

115. The MSA defines the boundaries of an area in which specified rules set out in amateur fishing regulations apply. The default area of application for all the measures discussed in this paper (excepting measure (xi), which proposes applying an accumulation limit of two bag limits and the requirement to possess blue cod in the whole or gutted state to the Challenger (East) Area).

116. Some stakeholders have previously expressed concerns about fishing effort in the wider Sounds areas, including effort displaced by the more restrictive rules applying in the current MSA, potentially causing localised depletion in these areas. The IPP proposed expanding the MSA to encompass the wider Sounds area, including western D'Urville Island, the Brothers Islands and Port Underwood (refer Figure 1 for the existing and proposed MSA boundaries). The West D'Urville Island area has been surveyed three times – in 2004, 2007 and 2010 (tables 1 and 2). Survey information for the West D'Urville strata suggests that blue cod abundance is stable, however, the information is uncertain as there are only three survey points.

117. Considerable opposition to the extension of the boundary was expressed in submissions. Submitters noted: that the outer most areas of the Sounds have not experienced depletion and therefore do not require additional management; and, that fishing effort in these areas was governed by weather, tide and access constraints which meant it was unlikely to ever reach to the level that may result in localised depletion. Approximately 20 submissions supported the proposed extension. Soundfish considered it would be irresponsible not to address the entire Sounds blue cod fishery.

118. The proposed boundary is expected to be easier to enforce than the current boundary. The proposed boundary would include all the landing points most commonly used by amateur fishers fishing in the Sounds other than Delaware Bay and Nelson. Low buy-in for the expansion from the amateur fishing community may decrease the effectiveness of this measure, however. It may also increase tension between amateur fishers and the commercial sector as the extended area encompasses a greater number of areas where commercial fishers target blue cod.

#### (ix) No Take Zone for Maud Island

119. A study conducted by the Cawthron Institute in 2010 showed that Maud Island appeared to have a relatively high spawning biomass across all years, suggesting that it is a good candidate for a no-take zone. A no-take zone within the Sounds is likely to provide a valuable learning opportunity to monitor changes in population abundance, sex ratio and size structure with a large, almost complete, reduction in harvest and may benefit blue cod populations in the wider Sounds via the transfer of eggs and larvae.

120. The IPP proposed that amateur fishers be prohibited from taking all finfish species from a defined area around Maud Island (Figure 4). Amateur fishers would still be able to participate in the shellfish and other fisheries, e.g. diving for scallops and paua.

121. The vast majority of submissions supported the introduction of a no take zone and many express that they would support the introduction of more such areas within the Sounds. A no-take zone is an easy measure for fishers to comply with, which may increase its effectiveness. Several submitters considered that customary fishers should be required to comply with a no-take zone in order for it to be fair and effective.

The Ministry notes that a no-take zone would not affect tangata whenua rights to harvest under customary permits. If tangata whenua were to harvest in the no-take zone, the value

of the area as a monitoring site may be compromised, but benefits via egg and larvae transfer may still be achieved. Initial discussions with tangata whenua indicate the Maud Island area is an important traditional fishing area and that tangata whenua consider its protection important.

(x) Introduction of an Amateur Fishing Permit

122. This measure would require amateur fishers to hold a fishing permit when fishing for blue cod in the MSA. Information on fisher participation levels and catch are important for informing fisheries management decisions. In the Marlborough Sounds blue cod fishery, where amateur fishers take the majority of fish, such information is critical and a permitting requirement would assist with the collection and accuracy of this type of information.

123. The majority of submitters who commented on the measure opposed an amateur permit scheme. These submitters consider the permit scheme unnecessary, are concerned it would result in an unfair cost to amateur fishers or suggest it is against the principles of amateur fishing in New Zealand. Soundfish and SeaFIC supported an amateur permit scheme, stating it would aid the collection of information about amateur fishing activity and help educate amateur anglers about sustainable fishing practices.

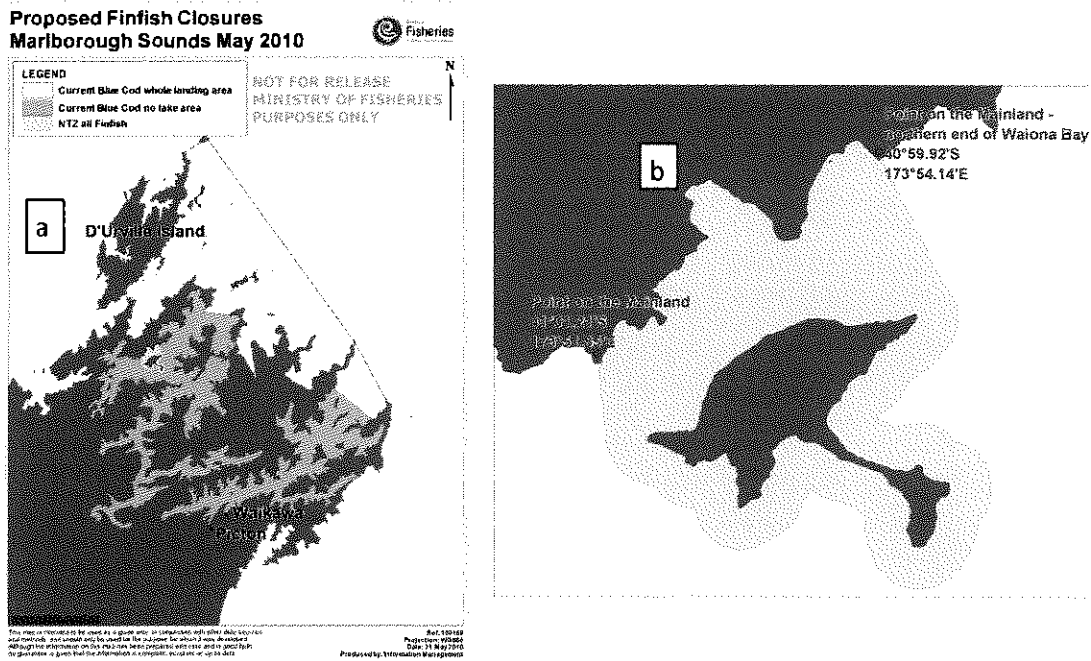


Figure 4. Proposed No Take Zone for Maud Island showing a) its position in the Marlborough Sounds and (b) the boundaries of the proposed zone.

124. The development, implementation and ongoing administration associated with permitting schemes can be costly, and it is unclear whether the benefits would outweigh the costs associated with implementing such a scheme for a single species in a localised area.

(xi) Introduction of Measures into the Challenger East Area

125. Information on blue cod populations within the Challenger (East) Area is limited. Davey et al (2008) estimated that in 2004/05 the recreational blue cod harvests in Golden Bay and Tasman Bay were approximately 23.8 t. Only two strata from the abundance surveys are included in this survey - West D'Urville Island has been surveyed three times in 2004, 2007 and 2010 (tables 1 and 2) and Separation Point has been surveyed in 2004 and 2007. Preliminary data from the 2010 survey suggest that adult blue cod abundance in West

D'Urville Island strata may be stable or decreasing slightly. At Separation Point, adult biomass was found to be low in both surveys.

126. The IPP proposed introducing a daily bag limit of two, an accumulation limit of two daily bag limits, a minimum legal size limit of 33cm, and the filleting rule to the wider Challenger (East) Area. These measures would reduce the risk of blue cod being depleted in these areas in the future.

127. The current bag limit is three blue cod per person per day and the minimum legal size limit (MLS) is 30 cm total fish length. No accumulation limit or filleting restriction currently applies. Consequently, the proposed measures would reduce amateur utilisation benefits in these areas. Some submitters considered the introduction of the proposed measures into the Challenger (East) Area too restrictive as there is no evidence of depletion in this area currently. Ngāti Tama Manawhenua ki Te Tau Ihu Iwi Trust, Soundfish, TASFISH and other submitters supports the introduction of additional management measures into this area, as they believe this area is at risk of depletion. As targeted commercial fishing for blue cod occurs in Challenger (East) Area, outside of the MSA, the introduction of stricter measures to regulate amateur fishing effort within this area may cause tension between amateur and commercial fishing sectors. This may also lead to lower buy-in from the amateur fishing community to any new measure introduced.