

Bluenose (BNS 1, 2, 3, 7 and 8): Final Advice Paper

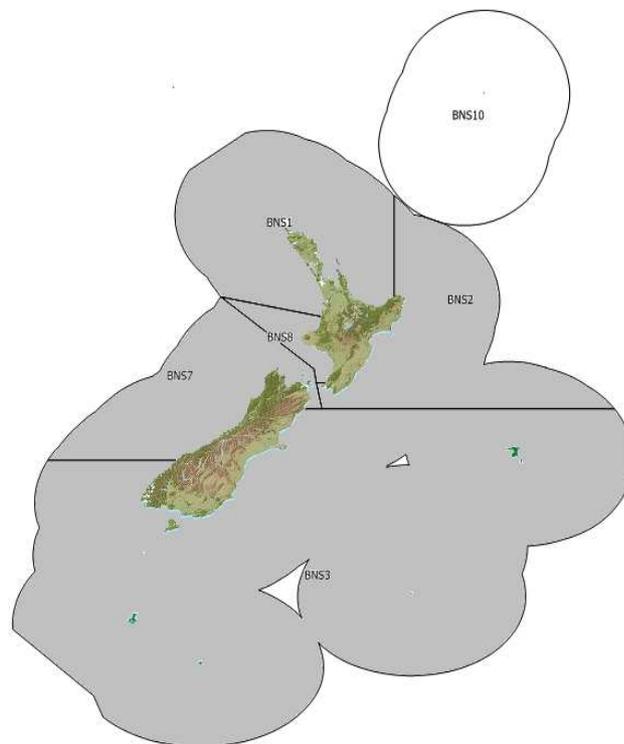


Figure 1: The Quota Management Area (QMA) boundaries for bluenose.

Summary

1 The Ministry of Fisheries (the Ministry) is recommending that you reduce the catch limits for BNS 1, 2, 3, 7 and 8 because of sustainability concerns. The Ministry proposes three options for your consideration. Each option results in a reduction of the combined Total Allowable Catch (TAC) for bluenose stocks but represents different ways and rates to rebuild bluenose towards a target stock size. Option A represents a single reduction to the TAC and Options B and C propose phased reduction strategies over 3 and 5 years, respectively.

2 A significant proportion of the catch reductions proposed in the options are borne by the commercial sector. This is because the commercial sector takes the greatest proportion of bluenose overall and has benefited from catch increases in the past. The options also propose reducing customary Māori catch allowance in each Quota Management Area (QMA). The reduction is proposed only to reflect available information that suggests that little bluenose is taken using customary permit authorisations at this time and does not affect customary fishing activity.

3 The Ministry also recommends decreasing the daily recreational bag limit to 5 bluenose. This is intended to constrain current catch during the stock rebuild, while allowing recreational fishers to harvest what the Ministry considers a 'reasonable' amount.

4 The three options for your consideration are summarised in the table below:

Table 1: Final Proposed and Current Management Options for BNS 1, 2, 3, 7 and 8. The numbers in bold correspond to the catch limits proposed for 2011/12.

Option	Fishing year	Combined total for BNS 1, 2, 3, 7 and 8					
		TAC (t)	TACC (t)	Other sources (t)	Māori customary (t)	Recreational	
						Allowance (t)	Bag limit for each QMA (t)
Current settings		2477	2325	47	42	63	20 or 30 (part of mixed bag)
A	2011/12	787	700	15	9	63	5
B (3 year phased approach)	2011/12	1685	1580	33	9	63	5
	2012/13	1194	1110	22			
	2013/14	704	620	12			
C (5 year phased approach)	2011/12	1603	1500	31	9	63	5
	2012/13	1225	1130	23			
	2013/14	1225	1130	23			
	2014/15	521	440	9			
	2015/16	521	440	9			

5 Submissions from the commercial sector supported a phased reduction over 5 years as proposed in Option C. The commercial sector submissions noted the uncertainty in the stock assessment and were predominantly concerned with the potential short-term impact of the proposed TAC reductions on Industry. Submissions from recreational sector participants, customary representatives and environmental organisations supported the single reduction proposed in Option A. These submissions considered that the sustainability risk was great enough that immediate action needed to be taken to secure a rebuild of bluenose.

Key Considerations

Need to Act

6 A stock assessment in 2011 assessed the combined current stock size for all bluenose stocks as being below the target stock size and as likely as not to be less than the soft limit reference point.¹

7 The stock assessment projections indicate that the bluenose stock will continue to decline under current TACs and current catch levels. Consequently, the Ministry considers the combined TACs for BNS 1, 2, 3, 7 and 8 are not consistent with the obligations of the Act.

Bluenose Biological Characteristics & Associated Species

8 Bluenose are long-lived (maximum age of 76 years) and have a low mortality rate (less than 0.1). These biological characteristics make bluenose a low productivity stock (based on the productivity characterisation in the Harvest Strategy Standard). Low productivity stocks are more likely to decline rapidly under fishing pressure and take a long time to rebuild from low levels of abundance. A more cautious approach to fisheries management is therefore desirable for low productivity stocks relative to more productive species.

9 Biological stock boundaries are unknown for New Zealand bluenose, but similarities in catch per unit effort (CPUE) trends between each of the five bluenose QMA's suggest there may be just one biological stock across all these areas, or a strong relationship between the fish in these areas. Tagging studies have shown bluenose are capable of extensive migration, which suggests the single stock hypothesis is plausible. In addition, bluenose have a long larval life span followed by a 2 year pelagic phase which would allow the population to be well mixed. However, there is no conclusive information available to confirm this hypothesis or alternate hypotheses of stock relationships.

10 Research trawl surveys record the main depth range of bluenose as 250–750 m, with a peak at 300–400 m. Adult bluenose are known to associate closely with underwater topographic features (hills and seamounts).

11 Bluenose are preyed upon by other fish species, such as broadbill swordfish. The significant decline in bluenose biomass may have an impact on predator species like broadbill swordfish, subject to the availability of alternative food sources. The decline in abundance may also affect other complex interactions within the ecosystem. For example, bluenose is likely to be an important predator, feeding on tunicates, fish, squid and crustaceans. A change in predation pressure may alter competitive interactions between these species.

Relevant Fishery Information

Commercial

12 The commercial fishing sector harvests the greatest portion of the total bluenose catch. Commercial harvest levels were identified as a key driver of the decline in stock

¹ A “soft” limit is a biological reference point that triggers a recommendation for a formal, time-constrained rebuilding plan when the Ministry’s *Harvest Strategy Standard* is applied.

abundance. The Plenary noted other potential contributing drivers such as recruitment and environmental factors.

13 Between 1992 and 2009, all bluenose fishstocks were included, for at least some of the time, in Adaptive Management Programmes (AMPs). The goal of the AMPs was to increase commercial utilisation in low knowledge stocks while providing a cost-effective way to obtain more information on stock status to enhance the assessment of management options.

14 Under AMPs, the bluenose combined TACCs increased by over 1000 t. In response to information suggesting declines in abundance in BNS 1, 2, 3, 7 and 8, TACCs were reduced in 2008 to the current combined TACC of 2325 t (Table 1) and additional research was initiated.

15 Bluenose is often taken in conjunction with commercial fisheries that are associated with undersea features, such as midwater trawling for alfonso and line fishing for ling, hapuku and bass. Over the past ten years, reported bycatch of bluenose has ranged from around 440 tonnes to 1200 tonnes (see appendix 3 for more information). Industry has suggested that unavoidable bycatch of bluenose is most likely to be an issue for line fisheries targeting species that shoal with bluenose, such as hapuku and ling. In recent years, approximately 40% of reported bycatch came from line fishing for these species.

Recreational

16 The total combined recreational allowances for all bluenose QMAs is 63 tonnes. This allowance level is based on 2000/01 diary survey estimates of recreational catch.

17 The Recreational Technical Working Group has indicated its concerns that the surveys completed to date are likely to be inaccurate. However, there is no new or better information on recreational catch currently available.

18 Anecdotal information² suggests recreational fisher interest in bluenose may have increased in recent years. An increase in the availability of fishing equipment that may allow recreational fishers to target bluenose more efficiently; braided line and electric reels for deep fishing, as well as GPS and sonar equipment to target underwater features.

Customary catch

19 Information on the level of customary Māori catch of bluenose is uncertain. Some information on customary Māori harvest is available through reporting from customary fishing authorisations. This information is incomplete and highly uncertain as many tangata whenua groups still operate under regulation 27 and 27A of the Fisheries (Amateur Fishing) Regulations 1986, for which reporting is not mandatory.

20 No customary authorisations have been reported for bluenose in any QMA since 2007. This may indicate that tangata whenua use of customary Māori harvesting rights (as opposed to commercial or recreational) is low at this time.

² From Recreational Forum members and submissions from the New Zealand Recreational Fishing Council, Kaikoura Boat Club and Richard Craig

Proposals Consulted On

21 The Ministry's initial position paper proposed and sought stakeholder views on the following options for BNS 1, 2, 3, 7 and 8 (Table 2). The final proposals are as outlined in the Summary and Final Proposals sections.

Table 2: IPP Proposed Management Options for BNS 1, 2, 3, 7 and 8

Option	Fishing year	Combined total for BNS 1, 2, 3, 7 and 8					
		TAC (t)	TACC (t)	Other sources (t)	Māori customary (t)	Recreational	
						Allowance (t)	Bag limit for each QMA (t)
1	2010/11	787	700	15	9	63	5
2	2010/11	991	900	19	9	63	5
3 (3 year staged approach)	2010/11	1705	1600	31	9	63	5
	2011/12	1245	1150	23			
	2012/13	787	700	15			
4 (5 year staged approach)	2010/11	1603	1500	31	9	63	5
	2011/12	1225	1500	23			
	2012/13	1225	1130	23			
	2013/14	521	1130	9			
	2014/15	521	440	9			

22 The four options represented different ways and/or rates of rebuilding the combined bluenose stock to a target stock size of $40\%B_0$:

- a) **Option 1** sought to rebuild the stock to target stock size in 20-26 years. This is consistent with the *Harvest Strategy Standard* (HSS) recommended rebuild time of 2 times T_{min} ³.
- b) **Option 2** had a longer rebuild timeframe; it sought to rebuild the stock to target stock size in 30-36 years ($3 \times T_{min}$). A longer rebuild timeframe allows a higher TAC to be set, this may be appropriate to mitigate the short-term social, cultural and economic impacts, particularly on the commercial sector.

23 Options 3 and 4 used staged cuts to the TACs, rather than the single cut proposed in Options 1 and 2. Options 3 and 4 sought to mitigate short-term social, cultural and economic impacts, particularly on the commercial sector, by providing more time to adjust to lower catch limits.

- a) **Option 3** proposed three consecutive cuts, reducing the TAC by 772 tonnes (t) in 2011/12, 460 t in 2012/13 and 458 t in 2012/13. Under this strategy, bluenose was projected to rebuild to target stock size in 18-36 years, which is $2-3T_{min}$.
- b) **Option 4** proposed three cuts over five years, reducing the TAC by 874 t in 2011/12, 378 t in 2013/14 and 704 t in 2015/16. Under this rebuild plan, the projected rebuild time to target stock size was 16 to 27 years, which approximates 2 times T_{min} and thus is consistent with the HSS recommended

³ T_{min} is the length of time the stock would take to rebuild to the target size if there was no fishing.

approach. This option was put forward by the four inshore commercial finfish stakeholder organisations and the major bluenose quota owners.

Submissions

24 The Ministry received 12 submissions on the BNS 1,2,3,7 and 8 IPP from:

- A joint submission from Industry including Area 2 Inshore Finfish Management Company Ltd, Challenger Finfisheries Management Company Limited, South East Finfish Management Ltd, The Northern Fisheries Management Company Ltd., quota owners including but not limited to Sanford Ltd., Talleys Group Ltd., Leigh Fisheries Ltd., Te Ohu Kai Moana, Aotearoa Fisheries Ltd., The Iwi Collective Partnership, Ngati Whatua, Federation of Commercial Fisheries, Leigh Commercial Fishermen's Association, Seafood Industry Council, Stu Morrison and some individual fishers.
- Area 2 Inshore Finfish Management Company Ltd (Area 2)
- Bill Hartley
- Challenger Finfisheries Management Company Limited (Challenger Finfisheries)
- Environment and conservation organisations of Aotearoa New Zealand (ECO)
- Kaikoura Boating Club Committee
- Nathaniel Paul Davey
- New Zealand Recreational Fishing Council (NZRFC)
- New Zealand Sports Fishing Council (NZSFC)
- Richard Craig
- Te Uri O Hau Settlement Trust
- World Wildlife Fund (WWF)

25 Copies of all submissions on all inshore IPPs are provided to you in a separate volume.

Final Proposals

26 The Ministry proposes the following three options for your consideration. Options A and C are the same as Options 1 and 4 in the IPP. Option B is a modified version of the IPP Option 3, based on feedback from submitters.⁴ The IPP Option 2 has not been carried through to this advice as no submitters supported this option.

27 Option A proposes a single cut to the TACs for each QMA, to a level that will allow for rebuild of the biomass. Options B and C propose phased reductions to the TACs.

⁴ Option 2 in the IPP has been removed. Industry submitted that a single cut approach did not allow the commercial sector time to transition, even when the TAC was kept slightly higher. Option 3 in the IPP to reduce the TAC in three consecutive steps over three years has been modified to take into account Industry feedback that the rebuild timeframe was too long.

Table 3: Final Proposed Management Options for BNS 1, 2, 3, 7 and 8

Option	Fishing year	Combined total for BNS 1, 2, 3, 7 and 8					
		TAC (t)	TACC (t)	Other sources (t)	Māori customary (t)	Recreational	
						Allowance (t)	Bag limit for each QMA (t)
Current settings		2477	2325	47	42	63	20 or 30 (part of mixed bag)
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	2014/15	521	440	9			
	2015/16	521	440	9			

28 Best available information suggests bluenose is a single stock. However the species is currently managed across 5 Quota Management Areas with separate TACs, TACCs and allowances. The proposals are intended to rebuild the stock overall. This is to be achieved by setting the combined TACs for BNS 1, 2, 3, 7 and 8 at a level that will allow the stock to rebuild to a target stock size, which is consistent with section 13 of the Act.

29 The stock assessment model estimated a deterministic B_{MSY} of between 15 and 25% B_0 ^[1]. The Ministry considers there are technical issues^[2] with the approach used to calculate this estimate. For example the estimate does not take into account natural variation in stock size. The estimate also contains a high level of uncertainty. After considering these factors, the Ministry has decided not to set a target stock size based on this estimate of B_{MSY} at this time.

30 In the absence of a suitable estimate of a stock-specific B_{MSY} , the HSS guidelines recommend the use of a proxy B_{MSY} for setting a target stock size. For a low productivity stock, such as bluenose, the default proxy B_{MSY} is 40% B_0 . This default proxy is based on an approach which takes into account the fact that fish stocks fluctuate naturally with prevailing ecological and environmental conditions. This approach reduces the risk that a stock will fall below the soft or hard limit, compared to the approach used to estimate deterministic B_{MSY} .

^[1] Deterministic B_{MSY} is estimated as 25% B_0 when the steepness of the stock-recruit relationship (h) is assumed to be 0.75 and 15-18% B_0 when h is assumed to be 0.9.

^[2] The methodology assumes (i) perfect knowledge of catch and biological information (ii) there will be no temporal variation in the stock-recruit relationship, which is actually very poorly known (iii) a constant fishing mortality rate management strategy with annual changes in TACC.

31 The Ministry proposes that the target stock size for bluenose be set at 40% B_0 at this time, using the recommended defaults set out in the HSS. The Ministry recommends that the TACs are varied under section 13(2)(b) of the Act to a level that will move the bluenose stock towards the target stock size of 40% B_0 in a way and at a rate you consider appropriate.

32 All of the options outlined in the FAP seek to rebuild bluenose to target stock size within a period that is consistent with the recommendations of the HSS. For a stock at or below its soft limit, the standard recommends a rebuild timeframe of between T_{min} and 2 times T_{min} (where T_{min} is the length of time the stock would take to rebuild if there was no fishing). For bluenose, the estimate of T_{min} is 10-13 years, suggesting an appropriate maximum rebuild time of 20 to 26 years. The proposed options are expected to rebuild within a period closely approximating 2 times T_{min} . You have discretion to choose a faster or slower rebuild time if you believe that would better meet your statutory obligations.

33 In making your decision you should consider the risk to the sustainability of bluenose under each of the proposed options. Taking a staged approach to reducing the TACs, as proposed by Options B and C, may mean that the stock continues to decline for longer and the stock stays at a lower biomass before a rebuild is initiated.

34 When considering the staged approach options, the Ministry recommends you consider the implications of your management decision within the context of the overall plan to rebuild the stock. The decision to allow the biomass of a stock to move away from the target stock size is consistent with your obligations under the Act, so long as your overall plan (over a timeframe you consider appropriate) is to rebuild the stock to the target level.

35 Section 13(3) requires that, in considering the way and rate at which a stock moves towards target stock size, you shall have regard to such social, cultural, and economic factors as you consider relevant when determining the way and rate at which to move the stock biomass toward or above the target stock size.

36 Each option differs in the way in which, and/or the rate at which, a rebuild to target stock size is achieved. Thus, the social, cultural and economic impacts also differ for each option. The phased approach proposed options 2 and 3 allows industry time to respond to the socio-economic consequences of the catch reductions. A trade-off for the staged reductions is that the final combined TAC needs to be set lower to allow the stock to rebuild in an acceptable timeframe.

37 Both short-term and medium to long-term social, cultural and economic impacts should be considered:

- a) Short-term social and economic costs predominantly will result from the proposed cuts to the TACs and TACCs.
- b) Medium to long-term costs to industry result from constraints to commercial utilisation during the rebuild. The lower the final TACs and TACCs are, the less commercial catch that can be harvested (in both target and fisheries associated with unavoidable bycatch) and the greater the economic costs are during the rebuild.

38 The stock assessment model was used to determine the catch levels required under each strategy (one cut, three year phased reduction, five year phased reduction) to achieve a rebuild to target stock size in $2 \times T_{min}$. The model estimated the catch levels necessary to achieve the rebuild under different scenarios based on the biological parameters. The scenarios ranged from more pessimistic to more optimistic depending on the values of biological parameters entered into the model. Under the most pessimistic scenario a lower

combined TAC is required to rebuild the stock in $2 \times T_{\min}$, whereas under a more optimistic scenario, a higher TAC will achieve the same rebuild timeframe.

39 The TACs proposed in options 1 and 2 lie in the middle of the range of TACs provided by the model. This is because the Ministry considers that the biological characteristics of bluenose are less likely to be at either the most pessimistic or most optimistic extremes of the range, and more likely to be somewhere in-between. The TACs proposed in option 3 are based on the most pessimistic scenario and the proposed TAC is lower than it would be if the TAC in the middle of the range had been used. As the lower TAC is used, option 3 is projected to rebuild the stock to target size 1- 2 years earlier than options 1 and 2.

40 The sustainability risk and social, cultural and economic factors are discussed for each option in a later section.

TACC and Allowance Setting

41 For all options, it is proposed that the catch reductions are borne by the commercial sector. The commercial sector takes the greatest proportion of bluenose overall and has benefitted from TAC increases in the past.

42 Changes to customary Māori allowances applying in each QMA are also proposed. Previously the customary Māori allowance was derived based on a percentage of the recreational allowance, which available information suggests resulted in an overestimate of Māori customary harvest. The changes to the allowance reflect new information that indicates little bluenose is taken using customary permit authorisations.

43 No change to the recreational allowance is proposed for any QMA. The recreational allowance has been set based on 2000/01 diary survey estimates of recreational catch and no new information is available to inform changes to the allowances.

44 Anecdotal information suggests recreational interest in bluenose may have increased in recent years. Given the likely increase in recreational effort, combined with the sustainability concern for bluenose, the Ministry recommends decreasing the current recreational bag limits (refer *Other Management Measures* section). The proposed bag limit is intended to constrain recreational catch while the stock rebuilds.

45 Quantitative estimates of other sources of fishing-related mortality are not available for bluenose. In previous TAC setting decisions for bluenose, an allowance for other sources of fishing-related mortality has been estimated at 2% of the TACC. The proposed decreases in allowances for other sources of fishing-related mortality approximately retain this proportion.

Distribution of combined TACC across QMAs

46 For each option, the reductions to the combined commercial catch will be allocated to individual QMAs (BNS 1, 2, 3, 7 and 8). For Option C Industry proposes an approach to allocation across QMA's which takes into account the extent of the decline in each QMA. They propose the BNS 7 and 8 TACC's should remain constant, as TACCs for these stocks were reduced significantly in 2008/09 and CPUE indices for these areas have not continued to decline. TACC's for BNS 1, 2 and 3 are all reduced by differing amounts based on an examination of the differences between area specific CPUE series and the outputs of the stock assessment model. The Ministry recommends adopting the industry preferred approach for both of the staged reduction approaches (options B and C) for the 2011/12

fishing year. The Ministry will consider how further reductions should be allocated in future reviews.

47 For option 1, the reductions to the combined commercial catch will be allocated proportionally across the QMA TACCs *after* taking into account 2007/08 bluenose TACC reductions in each QMA.

48 Table 4 outlines the proposed distribution of TAC reductions by QMA.

Table 4: Distribution of Proposed Total TAC across bluenose QMAs for 2011/12

Stock	Current TAC (t)	Option A (t)	Option B (t)	Option C (t)
BNS 1	825	238	567	600
BNS 2	958	259	634	669
BNS 3	551	225	259	273
BNS 7	96	39	96	96
BNS 8	47	26	47	47

Uncertainty in information

49 Industry is concerned that fishers anecdotal catch experiences do not align with the recent assessment which estimates the bluenose stock may be substantially below target biomass levels. In contrast, recreational fishers report catch experiences which indicate a severe drop in stock abundance and also in the average size of bluenose.

50 Area 2 raises the following concerns and suggests these concerns raise issues about the validity of the stock assessment:

- Permit holders agree unanimously that bluenose is not a single stock.
- The CPUE indices are indicative, but not definitive as to the extent to which bluenose has decreased.

51 The Ministry considers that anecdotal information is more uncertain than scientific information and open to bias. You should consider this uncertainty when determining the weight to give this information when making your decision. Options in this paper have been based on the outputs of the stock assessment which represents the best available information on bluenose stock status and for assessing management options.

52 However, there is uncertainty contained within this information you should take into account when making your final decision (see Appendix 1 for a full assessment of the uncertainty).

53 The key uncertainties contained in the stock assessment model are:

- The appropriate values for biological parameters such as natural mortality and the steepness of the stock-recruit curve.
The stock assessment model incorporates this uncertainty by using a range of input values for these biological parameters. Thus, the predicted changes in

stock size under different future catch scenarios range from more pessimistic to more optimistic, depending on the input value for each biological parameter (see Appendix 2).

- The single biological stock assumption.
The close coincidence between trends in the CPUE indices for all bluenose fishstocks and the results of tagging studies led the Northern Inshore Science Working Group to conclude that bluenose may constitute a single New Zealand-wide stock. However the evidence of a single stock is inconclusive.

Option A

54 Option A proposes a single cut to reduce the combined catch from 2477 tonnes (t) to 787t in 2011/12. The TACs, TACCs and allowances are proposed to be allocated as outlined in the table below.

55 The proposed TAC of 787 t is projected to rebuild the stock to target size in 16-30 years. The rebuild timeframe range varies from the most pessimistic to most optimistic scenarios from the model (refer to paragraph 48). The Ministry considers it most likely the actual rebuild timeframe will be in the middle of this range, from 20-26 years, which is $2 \times T_{\min}$.

Table 5: 2011/12 proposed TAC's and allowances for each QMA in Option A.

Stock	Current TAC (t)	TAC (t)	TACC (t)	Māori customary allowance (t)	Recreational Allowance (t)	Other sources of mortality (t)
BNS 1	825	238	217	2	15	4
BNS 2	958	259	227	2	25	5
BNS 3	551	225	201	2	18	4
BNS 7	96	39	33	2	3	1
BNS 8	47	26	22	1	2	1

56 All submissions received from customary representatives (Environs Holdings Ltd), recreational representatives (New Zealand Recreational Fishing Council, New Zealand Sport Fishing and Mr Craig) and Environmental Non-government Organisations (ECO and WWF) support Option A. These submitters consider this option is necessary to:

- Ensure long-term sustainability by stabilising the stock quickly.
- Make sure the stock rebuilds in a time period that allows the needs of future generations to be met.

57 Industry does not support this option. They consider the time given to fishers to transition towards the proposed decreased TACCs to be unrealistic. Greg Bishop, Director of Leigh Fisheries estimates Option A would cost their company ~ \$4 million dollars and between 6 – 8 jobs. Additional information on the socio-economic analysis of the options is contained in Appendix 4.

58 The Ministry notes that this option has the lowest sustainability risk of the three options. The rebuild is initiated sooner and so the stock remains at a lower, more vulnerable stock size, for less time than under Options B and C.

59 The Ministry considers Option A is most appropriate if you wish:

- a) to ensure a rebuild is initiated from the 2011/12 fishing year onwards
- b) to take a cautious approach to setting the TAC given the uncertainty in the stock assessment and/or the assessment that bluenose has low productivity (low productivity stocks are more likely to decline rapidly under fishing pressure and have less capacity to rebound from low stock sizes)
- c) you consider is most important to not constrain the TAC any more than absolutely necessary during the rebuild, than it is to try to mitigate the short-term impacts of a TAC reduction

60 The Ministry notes that this option may provide the most benefit to non-commercial fishers due to a stock rebuild being initiated earlier. This may result in benefits such as increased catchability and increased fish size being realised sooner than in other options.

61 This option will have the greatest short-term impact on Industry (Table 6). A single cut approach provides minimal opportunity for industry to transition to a lower catches by adjusting business practices which may have a disproportionately severe impact economically and socially.

Table 6: Potential costs associated with option 1's proposed changes to the TACC.

Type of cost	Economic loss from TACC reduction 1 st year (2011/12)
Landings revenue ⁵ (NZ\$ million)	-6.5
ACE value ⁶ (NZ\$ million)	-2.0
Quota value ⁷ (NZ\$ million)	-24.0

62 This option provides for the less utilisation benefits over the minimum projected rebuild period compared to option B, but more than option C. This option allows 450 tonnes less bluenose to be harvested over the next 16 years compared to Option A and 660 tonnes more compared to Option C.

63 There is a risk that catch may not be constrained within significantly reduced TACs and TACCs. Appendix 3 outlines information on bycatch taken and relative stock sizes. Total bycatch at the current stock size is estimated to be 479 tonnes. The risk of over catch of TACCs as a result of bycatch in other fisheries will increase as biomass increases in size. Significant levels of over catch will compromise the timeframes for rebuild of the biomass.

64 The Ministry notes that tools are available under the Act to manage bycatch issues (e.g. deemed values, etc), although these tools impose additional socio-economic cost. Industry have noted in submissions that bluenose bycatch issues can be managed by adapting fishing practices. However, Industry also notes that if fisheries targeting species associated with bluenose have to reduce their effort, this will impose additional socio-

⁵ Calculated using the 2010/11 port price

⁶ Calculated using the 2010/11 ACE price

⁷ Calculated using the average 2010/11 ACE price divided by 8.5% (the Weighted Average Cost Of Capital used by most fishing companies, as submitted by industry)

economic cost. The Ministry will work with industry to address bycatch concerns should they arise.

Option B

65 This option proposes a phased reduction of the total catch. In 2011/12 it is proposed the catch limit would be reduced from 2477 tonnes to 1685 tonnes. The proposed allocation of the reduction in total catch by QMA, along with proposed allowances is outlined in table 7.

66 This option is based on the maximum commercial catch predicted by the stock assessment model that would allow the stocks to rebuild within $2 \times T_{\min}$ when catch is reduced in three equal cuts over consecutive years.

67 The proposed strategy is projected to rebuild the stock to target size in 16-30 years. The rebuild timeframe range varies from the most pessimistic to most optimistic scenarios from the model. The Ministry considers it most likely the actual rebuild timeframe will be around 20-26 years ($2 \times T_{\min}$).

Table 7: 2011/12 proposed TAC's and allowances for each QMA in Option B.

Stock	Current TAC (t)	Proposed TAC (t)	TACC (t)	Māori customary allowance (t)	Recreational Allowance (t)	Other sources of mortality (t)
BNS 1	825	600	571	2	15	12
BNS 2	958	669	629	2	25	13
BNS 3	551	273	248	2	18	5
BNS 7	96	96	89	2	3	2
BNS 8	47	47	43	1	2	1

68 The 2011/12 reduction on its own is not sufficient to enable a rebuild of the biomass. Under this option the Ministry will propose further, approximately equal reductions of the TAC to 1194 tonnes in 2012/13 and to 704 tonnes in 2013/14. Any new information that becomes available between now and the time of your decision will be provided to you so that it can be taken into account when you make your subsequent decisions

69 There has been no comment on this option from stakeholders. It was developed following submissions on the options proposed in the IPP.

70 Option B does not significantly increase the sustainability risk when compared to Option A as:

- Under the most pessimistic scenario, stock size will decrease by only an additional 0.6% B_0 compared to Option A.
- The model projects that the maximum number of years bluenose may remain below the soft limit is only 3 years longer than Option A.

71 This phased approach seeks to reduce short-term social, cultural and economic impacts on the commercial sector. A phased reduction in TACs and TACCs across three years, as part of a formal rebuilding plan, provides quota owners, fishing companies, and

ACE holders time to plan for the change by adjusting their budgets and activities, including their ACE distribution or harvesting plans.

72 This option reduces the TACC less than option A or B in the first year, and thus has the lowest economic cost for the first year (Table 8).

73 The costs associated with the proposed reductions to the TACC are higher than for options A but they are spread out over 3 years (Table 8).

Table 8: Potential costs associated with proposed changes to the TACC for option 2

Type of cost	Economic loss from TACC reductions			
	1 st year (2011/12)	2 nd year (2012/13)	3 rd year (2013/14)	Total
Landings revenue (NZ\$ million)	-2.3	-2.2	-2.2	-6.7
ACE value (NZ\$ million)	-0.7	-0.7	-0.7	-2.1
Quota value (NZ\$ million)	-8.5	-8.3	-8.3	-25.1

74 This option provides for the most utilisation benefits over the minimum projected rebuild period of the three options. This option allows 450 tonnes more bluenose to be harvested over the next 16 years compared to Option A and 1,110 tonnes more compared to Option B.

75 There is a risk that catch may not be constrained within significantly reduced TACs and TACCs. There are tools available to address these issues but additional cost may be imposed on fishers in the target fisheries to ensure bluenose rebuilds within the timeframe specified. The Ministry will work with industry to address these concerns.

Option C

76 Option C was put forward by Industry and proposes a phased reduction of the total catch. In 2011/12 it is proposed the catch limit would be reduced from 2477 tonnes to 1603 tonnes. The proposed allocation of the reduction in total catch by QMA, along with proposed allowances is outlined in table 7.

77 Under the strategy proposed in Option C, the stock is projected to rebuild in 16 – 26 years. The rebuild timeframe range varies from the most pessimistic to most optimistic scenarios from the model (refer to paragraph 48). The Ministry considers it most likely the actual rebuild timeframe will be around 18-24 years, which is slightly less than $2 \times T_{\min}$ and around 2 years faster than expected for Options A and B.

78 As with Option B, the reduction proposed for 2011/12 is not sufficient to rebuild the biomass. Under this option the Ministry will propose two further reductions to TACs and TACCs over the next five years (to 1225 tonnes in 2013/14 and to 521 tonnes in 2015/16). As with Option B, the overall plan under this option is to rebuild the stock within the time period recommended by the HSS. Any new information that becomes available between now and the time of your decision will be provided to you so that it can be taken into account when you make your subsequent decisions.

Table 9: 2011/12 proposed TAC's and allowances for each QMA in Option C.

Stock	Current TAC (t)	TAC (t)	TACC (t)	Māori customary allowance (t)	Recreational Allowance (t)	Other sources of mortality (t)
BNS 1	825	567	539	2	15	11
BNS 2	958	634	595	2	25	12
BNS 3	551	259	234	2	18	5
BNS 7	96	96	89	2	3	2
BNS 8	47	47	43	1	2	1

79 Industry supports Option C as they consider it has the following benefits:

- a) Meets the obligations under the Act and is consistent with the HSS
- b) Provides the best opportunity for quota owners and fishers to manage the flow-on effects (social and financial) of a reduced TACC
- c) Allows for continued monitoring of the CPUE for the next 4 years
- d) "Provides a window" for additional research to be undertaken with the aim of reducing uncertainty in the stock assessment.

80 The Ministry considers this option presents a similar sustainability risk as Option B. The stock size will only decrease by an additional 0.8% B_0 compared to Option A and is projected to remain below the soft limit a maximum of 4 years longer than Option A.

81 The rebuild timeframe under this option is dependent on catch not exceeding the proposed combined catch of 521 tonnes from 2015-2016 (if this reduction is needed) for the remainder of the rebuild (minimum of 16 years). A 521 tonne combined limit is the lowest proposed across all of the options. The Ministry considers there is greater risk of overcatch under this option, particularly as the stock rebuilds, which may result in an extension to the projected rebuild timeframe.

82 The Industry does not consider that setting a TACC that is below current and projected bycatch levels (refer Appendix 3) will result in a risk of overcatch as they consider fishers will be able to modify their practices to avoid catching bluenose. They also consider the 5-year phased reduction provides enough time for fishers to adapt to the reduced catch limits.

83 The impact on Industry would still be significant under this option and slightly higher in the first year than Option B (Table 8).

84 The costs associated with the proposed reductions to the TACC are higher than for options A and B, due to the larger overall cuts required, but they are spread out over a longer period of 5 years (Table 8).

Table 8: Potential costs associated with proposed changes to the TACC for option 2

Type of cost	Economic loss from TACC reductions			
	1 st year (2011/12)	3 rd year (2013/14)	5 th year (2015/16)	Total
Landings revenue (NZ\$ million)	-2.7	-1.8	-3.3	-7.8
ACE revenue (NZ\$ million)	-0.8	-0.6	-1.0	-2.4
Quota value (NZ\$ million)	-9.9	-6.5	-12.2	-28.6

85 The Ministry agrees that the utilisation benefits of this option are that the longer phased reduction allows fishers more time to adapt to lower catch limits than under Options A and B. The Ministry notes, however, the proposed large final reduction to TACs and TACCs in 2015/2016 (690 tonnes) will still have significant socio-economic impacts on industry.

86 This option provides for the least utilisation benefits over the full rebuild period of the three options. This option allows 1110 tonnes less bluenose to be harvested over the next 16 years compared to Option B and 660 tonnes less compared to Option A.

87 The lower TAC is also most likely to result in additional socio-economic costs associated with bycatch issues during the rebuild (for example, fisheries targeting other species that take bluenose as bycatch having to reduce effort, as well as Ministry applied tools such as deemed values).

Other considerations

Monitoring of stock status

88 Industry is concerned that following a reduction in the TAC the ability to monitor the fishery by CPUE analysis will be compromised. They consider it important to consider how the fishery will be monitored with future changes in abundance. ECO and NZSFC also consider it important to maintain an abundance index to facilitate reviews of the TAC, should the rebuild happen faster than expected. NZSFC suggest using a bycatch CPUE.

89 The Ministry note that the current stock assessment model uses CPUE data to track abundance. A reduction to the TACC is likely to cause significant changes to commercial fishing practices, resulting in the discontinuation of the current CPUE indices. All options are considered likely to result in significant changes to fishing practices and the disruption of CPUE indices from target fisheries.

90 There is a possibility of using other ways to monitor stock status, such as bycatch CPUE data or catch-at-length data from sampling of commercial catches. However these concepts have not yet been fully explored.

91 While impacting on ability to monitor the fishery is a consideration, ensuring sustainability of catches and rebuilding the biomass should be your primary concern. The Ministry will continue to explore alternative monitoring options with industry.

Additional Management Controls

Recreational Bag Limits

92 The Ministry proposes setting a daily bag limit of five bluenose per person per day for all management areas.

93 Two of the four recreational sector submitters (NZRFC and NZSFC) do not support the decrease in the recreational bag limit. These two submitters view the decrease in bag limit unfairly restrict recreational fishers, given that they often have to travel long distances to target bluenose. Kaikoura Boating Club Committee support reducing the bag limit to 5 for their area although they consider that for people who need to travel a long way to access bluenose, a bigger bag limit is justified.

94 The Ministry notes that there is no new information to support an assessment of recreational harvest. There is also no information to indicate whether the current daily bag limit is being taken. However, the Ministry considers it prudent to reduce the daily bag limit given the:

- Sustainability concerns associated with bluenose
- Increased recreational interest and ability to target bluenose
- Risk of a potentially unsustainable increase in catch within the existing bag limit

95 Bluenose is currently included in the mixed species daily bag limit. The mixed bag limit is 20 finfish per person per day in the Northern, Central and Challenger management areas (i.e., BNS 1,2,7 and 8) and 30 finfish per person per day in the South East, Southland and Fiordland management areas (BNS 3).

96 The current recreational allowances for bluenose are based on 2000/01 estimates of recreational catch. When this survey was carried out recreational fishers were considered to have low interest in the fishery. Anecdotal evidence provided by recreational forums and submissions suggests that recreational interest has increased. NZRFC submit that bluenose is now an important recreational stock throughout New Zealand. This is supported by submissions from NZSFC, Kaikoura Boating Club Committee and Richard Craig who note more recreational fishers now target bluenose due to the availability of equipment such as braided line and electric reels which facilitate deep sea fishing, as well as GPS and sonar equipment to target underwater features.

97 Given the limited information available, it is difficult to estimate how the bag limit reduction would translate to a specific tonnage of total recreational catch. NZRFC and Kaikoura Boating Club Committee suggest it highly probable the recreational take will exceed the proposed recreational allowance even under the proposed bag limit of 5 fish.

98 Rather than attempting to base a bag limit on poor information on recreational harvest, the proposed bag limit reflects current available information on individual catch levels and what is considered by the Ministry to represent a “reasonable”⁸ daily bag. However, you have discretion to choose a number other than 5 for the recreational bag limit.

⁸ Available anecdotal information supplied from boat ramp surveys and fisheries officer, indicates that fishers land, on average, approximately 2-5 bluenose per person.

99 The Ministry considers a bag limit of 5 bluenose per fisher per day does not unfairly constrain recreational fishers, even for those recreational fishers travelling long distances. NZRFC suggest the average weight of a bluenose is around 10kg. Using this estimation, the reduced limit will still allow fishers to take home around 50kg of bluenose each per trip. The Ministry considers the lower bag limit represents a reasonable catch.

100 The recreational daily bag limit proposals will require a regulatory change and separate implementation process. If adopted, a bag limit change would come into effect as soon as possible. There will be some cost involved in implementing any changes made to recreational bag limits, including regulatory amendments and updates to signage and recreational rule handbooks.

Deemed Values

101 The Ministry is consulting on changes to deemed value rates for a number of fisheries, including bluenose. The Ministry is proposing to change the current bluenose settings to provide increased incentives to balance catch with ACE post the reductions to catch limits. For further information, please refer to the *Deemed Value FAP*.

Assessment against Statutory Obligations

102 The Ministry considers that all options presented in this paper satisfy your obligations under section 13 of the Act in that they move the biomass towards B_{MSY} (or in this case, the target stock size of 40% B_0) and ensure the long term sustainability of the stock.

103 In setting or varying sustainability measures, you must also act in a manner consistent with New Zealand's international obligations to fishing and the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992.

104 A wide range of international obligations relate to fishing, including use and sustainability of fishstocks; and maintaining biodiversity (s 5(a)). The Ministry considers that the management options for bluenose are consistent with these international obligations.

105 The Ministry also considers the proposed management options to be consistent with the provisions of the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992 (s 5 (b)).

106 The Ministry has an obligation to provide for input and participation of tangata whenua and have particular regard to kaitiakitanga (under s 12). The Ministry sought input from and provided an opportunity for participation from iwi listed under schedule 3 of the Maori Fisheries Act 2004, the Ministry's Iwi Forums (via the forum chairs) and tangata whenua groups with a Fisheries Protocol. This opportunity was provided in writing prior to the development of the IPP. The Ministry did not receive any input on kaitiakitanga and customary interest in BNS during this time, although the Ministry acknowledges timeframes for input were short due to the development process. The Ministry is looking at ways to provide more time for input and participation of tangata whenua in the future.

107 In addition to an opportunity to input and participate in the development of the IPP the Ministry also consulted (as defined in section 12 of the Act) with the above tangata whenua groups and with tangata whenua who have registered an interest in RIB 9 on the options developed through the IPP. In particular, due to the uncertainty of the information the Ministry currently holds on customary permit fulfilment, the Ministry sought information from tangata whenua on levels of customary harvest. Input was received from Environs Holdings

Limited (a subsidiary of the Te Uri o Hau Settlement Trust), and, where relevant, their views have been incorporated into this FAP. The Ministry will continue to work with tangata whenua to improve reporting and information on customary non-commercial catches.

TAC

108 You are required to set a TAC for all inshore stocks under Section 13 of the Act. The status of the stock in relation to the biomass that provides the maximum sustainable yield (B_{MSY}) determines which sub-section of section 13 you should use to alter a TAC. The best estimate of bluenose biomass is between 17-27% B_0 , assuming a single stock.

109 The target stock size for bluenose has been set at 40% B_0 . The current stock status is below this level and as likely as not to be below the soft limit (half the target biomass or 20% B_0). The Ministry therefore recommends setting the TAC for bluenose under section 13(2)(b) of the Act, which requires you to restore the stock at or above a level that will produce B_{MSY} . In doing so you must have regard to:

- a) the interdependence of stocks;
- b) the biological characteristics of the stock; and
- c) any environmental conditions affecting the stock.

110 Bluenose are known to shoal with other targeted species such as hāpuku and ling (see Industry submission) and bluenose is known to be a bycatch in fisheries targeting these species. Setting a TACC below likely bycatch levels is expected to result in negative economic consequences on ACE fishers targeting ling and hāpuku. Bluenose bycatch is likely to be unavoidable in these fisheries as bluenose shoals with these species.

111 Bluenose is considered a low productivity species, and is likely to take a relatively long time to recover from a low biomass (under zero fishing pressure bluenose would take 10 -13 years to reach 40% B_0).

112 Seabirds are a known bycatch of long line fisheries targeting bluenose, however, all options proposed will reduce fishing effort and thus reduce the risk to seabirds.

113 Under section 13(3) of the Act, you must also have regard to relevant social, cultural and economic considerations in determining an appropriate way and rate to move the stock towards or above a target level. The options in this paper provide you with a choice on how to fulfil your 'way and rate' obligations. Under Options B and C you can choose a phased implementation which may allow industry time to adjust their fishing operations before the TAC is set at a level that will ensure the stock's long-term sustainability. In contrast, Option A will ensure that the optimum level for stock sustainability is reached immediately, but with the downside of greater economic impacts in the short term.

Information Principles

114 Section 10 requires that you take into account the information principles which require you to make decisions based on best available information and that you are cautious in making your decisions in instances where the information may be uncertain, unreliable or inadequate. Both the options and the analysis in this paper reflect the best available information on BNS 1, 2, 3, 7 & 8 and outline the uncertainty in the information available where it is relevant to your decision making. More detailed information on uncertainties associated with the stock assessment is also available in Appendix 1.

Section 11 considerations

115 In making your decision on sustainability measures for bluenose you must also have regard to the requirements of section 11 of the Act as follows:

- a) Section 11(1)(a): Before setting or varying any sustainability measure for any stock, you must take into account any effects of fishing on any stock and the aquatic environment. Bluenose is a bycatch in commercial bottom and mid-trawl fisheries targeting alfoncino, and also in long-line fisheries targeting hāpuku and ling. As the TAC proposals do not exceed historical recorded landings of bluenose bycatch, it is anticipated that the proposed TAC (and TACC) options may result in a change to these fishing operations. Therefore, it is anticipated there will be an impact on the harvest of other stocks. This impact will be greater in Option C than Options A and B.
- b) Section 11(1)(b): Before setting or varying any sustainability measure for any inshore stock, you must take into account any existing controls under the Act that apply to the stock or area concerned. Standard management controls apply to the bluenose fishery, for example deemed values, amateur bag limits and fishing method constraints. The proposed changes to the TAC do not affect most of these measures. Changes to amateur bag limits and deemed values are proposed. The impact of changes to bag limits is discussed in this paper. For further information on deemed value changes, please refer to the *Deemed Value Initial Position Paper*.
- c) Section 11(1)(c): Before setting or varying any sustainability measure for these stocks, you must take into account the natural variability of the stock. Bluenose stocks are not known to be highly variable.
- d) Sections 11(2)(a) and (b): Before setting or varying any sustainability measure for any stock, you must have regard to any provisions of any regional policy statement, regional plan, or proposed regional plan under the Resource Management Act 1991 and any management strategy or management plan under the Conservation Act 1987 that apply to the coastal marine area and you consider relevant. The Ministry is not aware of any such policy statements, plans or strategies that should be taken into account for the bluenose stock.
- e) Section 11(2)(c): Before setting or varying any sustainability measure for any stock, you must have regard to sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000 that apply to the coastal marine area and you consider relevant. Section 7 recognises the national significance of the Hauraki Gulf including its capacity to provide for the relationship of tangata whenua with the Gulf and the social, economic, recreational, and cultural well-being of people and communities. Section 8 sets out the objectives of the management of the Hauraki Gulf, which include the maintenance of the Hauraki Gulf for the social and economic well-being and its contribution to the recreation and enjoyment of the people and communities of the Hauraki Gulf and New Zealand. The maintenance and enhancement of the physical resources of the Gulf, which include bluenose, is also an objective. The reduction of the recreational bag limit in the larger area of BNS 1 may constrain recreational catch of bluenose within the Hauraki Gulf to a greater extent. However, the Ministry considers the objective of reducing recreational catch - to constraint on catch during a rebuild of bluenose in all areas, including the Hauraki Gulf – is consistent with sections 7 and 8 of the Hauraki Gulf Marine Park Act 2000.

- f) Section 11(2)(d): Before setting or varying any sustainability measure you must have regard to a planning document lodged with the Minister of Fisheries by a customary marine title group under section 91 of the Marine and Coastal Area (Takutai Moana) Act 2011. No such title exists in the BNS 1, 2, 3, 7 or 8 areas.
- g) Section 11(2A)(b): Before setting or varying any sustainability measure for any stock, you must take account of any relevant and approved fisheries plans. There is no approved fisheries plan in place for any bluenose stock at this time.
- h) Sections 11(2A)(a) and (c): Before setting or varying any sustainability measure for any stock, you must take into account any conservation or fisheries services, or any decision not to require such services. The Ministry does not consider that existing or proposed services materially affect the proposals for this stock. No decision has been made to not require a service in this fishery at this time.

Setting Allowances

116 Section 21 of the Act requires you to allow for Māori customary non-commercial interests, recreational fishing interests, and for any other sources of fishing-related mortality, when setting or varying the TACC. The Act does not provide an explicit statutory mechanism to apportion available catch between sector groups either in terms of a quantitative measure or prioritisation of allocation. Accordingly, you have the discretion to make allowances for various sectors based on the best available information.

117 For all three options presented to you Māori customary allowances are recommended to be set at 1/2 t. The Ministry recognises the information on customary is uncertain and is open to reviewing this allowance, if records support a change in the future. Similarly, the Ministry proposes an allowance for other sources of fishing related mortality at approximately 2% of the proposed TAC. This is similar to that set for comparable fisheries.

118 The Ministry has no information on recreational fishing effort that would change the current allowances for this sector.

119 Section 21(4) requires that any mātaihai reserve or closures/restrictions under s 186A or s 186B to facilitate customary Māori fishing be taken into account. The Ministry is aware there are mātaihai reserves and taiapure within BNS 1, 2, 3, 7 and 8. The Ministry notes that the proposals in this paper will not impact on, or be impacted by, the mātaihai reserves or taiapure.

Conclusion

120 Your obligation is to move a stock towards a biomass that can produce the maximum sustainable yield (MSY) and when deciding on a timeframe and the ways to achieve this you must consider all relevant social, cultural and economic factors.

121 The Ministry proposes three options for you to decrease the TACs for BNS. The Ministry notes that:

- a) Option A reduces the combined TAC across all stocks in a single cut to a level designed to rebuild bluenose abundance to target levels in 20-26 years. The reduction proposed for 2011/12 will allow the stock to begin to rebuild immediately, however, it would have significant socio-economic impacts on the commercial sector in the short-term. You would choose this option if you placed greatest weight on the sustainability risk given current stock status and consider it

necessary to commence rebuild of the fishery as quickly as possible. This option places less weight on the socio-economic impacts of the reduction.

- b) Option B reduces the combined TAC in three consecutive reductions to a level designed to rebuild bluenose abundance to target levels in 20-26 years. This option seeks to allow time for industry to respond to the social and economic impacts by spreading the catch reductions equally^[1] across three years. This option places greater weight on the socio-economic impacts than option one while still ensuring the stock rebuilds within the desired time period. This option seeks to balance to mitigate the short term and long term economic impacts by spreading the catch reduction necessary over three years and maintaining higher TACs over the entire rebuild period than under option 3.
- c) Option C reduces the combined TAC in three reductions over 5 years to a level designed to rebuild bluenose abundance to target levels in 20-26 years.. This option places greater weight on the socio-economic impacts than option one while still ensuring the stock rebuilds within the desired time period. This option places greatest weight on mitigating the short term economic impact by spreading the catch reduction necessary over 5 years. However it has the highest long term cost of all of the options proposed because the it has the lowest TACs over the entire rebuild period.

122 For each option, the reductions to the combined commercial catch will be allocated to individual QMAs (BNS 1, 2, 3, 7 and 8). For option A, the reductions to the combined commercial catch will be allocated proportionally across the QMA TACCs *after* taking into account 2007/08 bluenose TACC reductions in each QMA. This will result in the TAC and TACC for each QMA being reduced by varying amounts.

123 For Options B and C an allocation approach was taken which takes into account the extent of the decline in each QMA. The BNS 7 and 8 TACC's remain constant, as the CPUE indices for these areas have not continued to decline. TACC's for BNS 1, 2 and 3 are all reduced by differing amounts based on an examination of the differences between area specific CPUE series and the outputs of the stock assessment model.

124 The Ministry notes that you have broad discretion in exercising your powers of decision making and may make your own independent assessment of the information presented to you in your decision.

^[1] Equal from the catch level reported in 2009/10.

Summary of Recommendations

125 The Ministry recommends that a consistent option be chosen across the QMA's listed below (BNS 1, 2, 3, 7 and 8).

126 The Ministry recommends that for the **BNS 1** fishery, you choose either:

Option A YES/NO

A. **Agree** to decrease the TAC from 825 t to 238 t and within this:

- i. **decrease** the TACC from 786 t to 217 t
- ii. **decrease** the other sources of fishing-related mortality from 16 t to 4 t
- iii. **decrease** the allowance for Māori customary fishing from 8 t to 2 t
- iv. **retain** an allowance for recreational fishing of 15 t

AND

- i. **Agree** to set a recreational BNS 1 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option B YES/NO

B. **Agree** to decrease the TAC from 825 t to 600 t and within this:

- v. **decrease** the TACC from 786 t to 571 t
- vi. **decrease** the other sources of fishing-related mortality from 16 t to 12 t
- vii. **decrease** the allowance for Māori customary fishing from 8 t to 2 t
- viii. **retain** an allowance for recreational fishing of 15 t

AND

- ii. **Agree** to set a recreational BNS 1 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option C YES/NO

C. **Agree** to decrease the TAC from 825 t to 567 t and within this:

- ix. **decrease** the TACC from 786 t to 539 t
- x. **decrease** the other sources of fishing-related mortality from 16 t to 11 t
- xi. **decrease** the allowance for Māori customary fishing from 8 t to 2 t
- xii. **retain** an allowance for recreational fishing of 15 t

AND

- iii. **Agree** to set a recreational BNS 1 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

127 The Ministry recommends that for the **BNS 2** fishery, you choose either:

Option A

YES/NO

D. **Agree** to decrease the TAC from 958 t to 259 t and within this:

- xiii. **decrease** the TACC from 902 t to 227 t
- xiv. **decrease** the other sources of fishing-related mortality from 18 t to 5 t
- xv. **decrease** the allowance for Māori customary fishing from 13 t to 2 t
- xvi. **retain** an allowance for recreational fishing of 25 t

AND

- iv. **Agree** to set a recreational BNS 2 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option B

YES/NO

E. **Agree** to decrease the TAC from 958 t to 669 t and within this:

- xvii. **decrease** the TACC from 902 t to 629 t
- xviii. **decrease** the other sources of fishing-related mortality from 18 t to 13 t
- xix. **decrease** the allowance for Māori customary fishing from 13 t to 2 t
- xx. **retain** an allowance for recreational fishing of 25 t

AND

- v. **Agree** to set a recreational BNS 2 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option C

YES/NO

F. **Agree** to decrease the TAC from 958 t to 634 t and within this:

- xxi. **decrease** the TACC from 902 t to 595 t
- xxii. **decrease** the other sources of fishing-related mortality from 18 t to 12 t
- xxiii. **decrease** the allowance for Māori customary fishing from 13 t to 2 t
- xxiv. **retain** an allowance for recreational fishing of 25 t

AND

- vi. **Agree** to set a recreational BNS 1 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

128 The Ministry recommends that for the **BNS 3** fishery, you choose either:

Option A

YES/NO

G. **Agree** to decrease the TAC from 551 t to 225 t and within this:

- xxv. **decrease** the TACC from 505 t to 201 t
- xxvi. **decrease** the other sources of fishing-related mortality from 10 t to 4 t
- decrease** the allowance for Māori customary fishing from 18 t to 2 t
- xxvii. **retain** an allowance for recreational fishing of 18 t

AND

- vii. **Agree** to set a recreational BNS 3 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option B

YES/NO

H. **Agree** to decrease the TAC from 551 t to 273 t and within this:

- xxviii. **decrease** the TACC from 505 t to 248 t
- xxix. **decrease** the other sources of fishing-related mortality from 10 t to 5 t
- xxx. **decrease** the allowance for Māori customary fishing from 18 t to 2 t
- xxxi. **retain** an allowance for recreational fishing of 18 t

AND

- viii. **Agree** to set a recreational BNS 3 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option C

YES/NO

I. **Agree** to decrease the TAC from 551 t to 259 t and within this:

- xxxii. **decrease** the TACC from 505 t to 234 t
- xxxiii. **decrease** the other sources of fishing-related mortality from 10 t to 5 t
- xxxiv. **decrease** the allowance for Māori customary fishing from 18 t to 2 t
- xxxv. **retain** an allowance for recreational fishing of 18 t

AND

- ix. **Agree** to set a recreational BNS 3 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

129 The Ministry recommends that for the **BNS 7** fishery, you choose either:

Option A

YES/NO

J. **Agree** to decrease the TAC from 96 t to 39 t and within this:

- xxxvi. **decrease** the TACC from t to 33 t
- xxxvii. **decrease** the other sources of fishing-related mortality from t to 1 t
- xxxviii. **decrease** the allowance for Māori customary fishing from t to 2 t
- xxxix. **retain** an allowance for recreational fishing of 3 t

AND

- x. **Agree** to set a recreational BNS 7 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option B

YES/NO

K. **Retain** the TAC of 96 t and within this:

- xl. **retain** the TACC at 89 t
- xli. **retain** the other sources of fishing-related mortality at 2 t
- xlii. **retain** the allowance for Māori customary fishing at 2 t
- xliii. **retain** an allowance for recreational fishing of 3 t

AND

- xi. **Agree** to set a recreational BNS 7 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option C

YES/NO

L. **Retain** the TAC of 96 t and within this:

- xliv. **retain** the TACC at 89 t
- xlv. **retain** the other sources of fishing-related mortality at 2 t
- xlvi. **retain** the allowance for Māori customary fishing at 2 t
- xlvii. **retain** an allowance for recreational fishing of 3 t

AND

- xii. **Agree** to set a recreational BNS 7 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

130 The Ministry recommends that for the **BNS 8** fishery, you choose either:

Option A

YES/NO

M. **Agree** to decrease the TAC from 47 t to 26 t and within this:

- xlviii. **decrease** the TACC from 43 t to 22 t
- xlix. **retain** the other sources of fishing-related mortality at 2 t
 - I. **retain** the allowance for Māori customary fishing at 1 t
 - li. **retain** an allowance for recreational fishing of 2 t

AND

- xiii. **Agree** to set a recreational BNS 8 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option B

YES/NO

N. **Retain** the TAC of 47 t and within this:

- lii. **retain** the TACC at 43 t
- liii. **retain** the other sources of fishing-related mortality at 1 t
- liv. **retain** the allowance for Māori customary fishing at 1 t
- lv. **retain** an allowance for recreational fishing of 2 t

AND

- xiv. **Agree** to set a recreational BNS 8 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

OR

Option C

YES/NO

O. **Retain** the TAC of 47 t and within this:

- lvi. **retain** the TACC at 43 t
- lvii. **retain** the other sources of fishing-related mortality at 1 t
- lviii. **retain** the allowance for Māori customary fishing at 1 t
- lix. **retain** an allowance for recreational fishing of 2 t

AND

- xv. **Agree** to set a recreational BNS 8 daily bag limit of 5 bluenose within the mixed finfish bag limit of 20 finfish

Leigh Mitchell
for Director General

AGREED / AGREED AS AMENDED / NOT AGREED

Hon Phil Heatley
Minister of Fisheries and Aquaculture

/ / 2011

Appendices

Appendix 1: Stock Assessment Uncertainties

The stock assessment model contains a number of assumptions which affect the potential accuracy of the models outcomes. The model used in the stock assessment incorporates the following assumptions:

Bluenose is a single stock

- The close coincidence between trends in the indices for all bluenose fishstocks led the AMP Working Group to conclude that bluenose may constitute a single New Zealand-wide stock.
- There is not conclusive evidence that bluenose is a single stock.
- Alternative stock hypotheses have not yet been thoroughly explored; however it is likely that the alternative stock hypotheses, such as the division of NZ bluenose into west and east coast stocks, would result in a more pessimistic view of overall stock status.

Standardised catch per unit effort (CPUE) is a reliable index of abundance

- CPUE indices were accepted as abundance proxies by the Northern Inshore Working Group.
- The possibility that there was a non-linear relationship between longline CPUE and abundance was explored (possibly caused by hyper stability). Preliminary modelling found a non-linear relationship did not improve the fit to the CPUE indices.
- The uncertainty of the CPUE indices should be considered when analysing the predictions of change in stock biomass, however the uncertainty does not represent a challenge to the fact that bluenose biomass has declined.

The values of the parameter inputs are correct

- Researchers explored the sensitivity of the model was to uncertainties in input parameters. The projections of the model were largely insensitive to variation in catch history. The model results were strongly influenced by the choice of value for natural mortality (m) and steepness of the stock-recruit curve (h).
- To address uncertainty in estimates of these parameters, the model used a range of values which incorporate the range of plausible values as advised by the stock assessment working group.

There is no spatial variation in biological parameters (e.g., growth, age-at-maturity)

- Catch at age data are limited, but suggest that the composition of catches can vary significantly on small spatial and temporal scales.
- The model does not incorporate this level of complexity in spatial variation. Given the current limited data it is hard to assess how much difference the incorporation of this complexity might make to the model outcomes.

Based on this analysis, the stock assessment is considered to provide the best available information on stock status and how future stock biomass is expected to change under different catch levels.

Appendix 2: Stock Assessment Input Values

A range of TACC's are given as the TACC estimated depends on the values of natural mortality (m) and steepness of the stock recruit relationship (h) entered in to the model. The range of parameters is agreed by the Stock Assessment Working Group as representative of the likely range that natural mortality and steepness for bluenose fall into.

T_{min} and therefore the predicted rebuild time, also varies under different values of these biological parameters.

Table 8. The axes give the range of biological parameters h and m entered into the model. The values in the table are maximum commercial catch (t) that would allow biomass⁹ to rebuild to target biomass within 2 times T_{min} .

		Steepness of stock recruit relationship (h)	
		0.75	0.90
Natural mortality (m)	0.06	600	720
	0.08	570	770
	0.10	600	840

Table 9. The axes give the range of biological parameters h and M entered into the model. The values in the table are the number of years before biomass³ reaches target stock size under the TACC's given in Table 12. These are equal to 2 times T_{min} .

		Steepness of stock recruit relationship (h)	
		0.75	0.90
Natural mortality (M)	0.06	26	24
	0.08	26	24
	0.10	22	20

⁹ Stock spawning biomass

Appendix 3: Bycatch

This data has been extracted from the bluenose characterisation report accepted by the Stock Assessment Working Group.

Table 10: Proposed final TACC's under the rebuild strategies proposed by each option

Proposed final combined TACC (t)		
Option 1 (single reduction)	Option 2 (3 year phased approach)	Option 3 (5 year phased approach)
700	650	440

Table 11: Historical level of bycatch for BNS 1, 2, 3, 7 and 8 (taken from fishery characterisation reports) and estimated biomass of bluenose (by the stock assessment model) for the same time period. Line and setnet includes setnet, long-line or dahn line methods. Trawl includes bottom and mid-water trawling.

Time period	Estimated stock size (% B₀)	Combined average bycatch (t)		
		Line & setnet	Trawl	Total
2001/02 – 2003/04	30% - 51%	362	790	1153
2004/05 – 2006/07	21% - 42%	225	573	798
2007/08 – 2009/10	16% - 34%	224	255	479

Table 12: Historical level of bycatch for each QMA (taken from fishery characterisation reports) by different fishing methods.

BNS 1

Time period	Average bycatch (t)		
	Line & setnet	Trawl	Total
2001/02 – 2003/04	87	96	183
2004/05 – 2006/07	64	52	116
2007/08 – 2009/10	57	32	89

BNS2

Time period	Average bycatch (t)		
	Line & setnet	Trawl	Total
2001/02 – 2003/04	68	453	521
2004/05 – 2006/07	45	326	371
2007/08 – 2009/10	32	128	160

BNS 3

Time period	Average bycatch (t)		
	Line & setnet	Trawl	Total
2001/02 – 2003/04	205	206	411
2004/05 – 2006/07	114	162	276
2007/08 – 2009/10	132	61	193

BNS 7 & 8

Time period	Average bycatch (t)		
	Line & setnet	Trawl	Total
2001/02 – 2003/04	2	36	38
2004/05 – 2006/07	2	34	35
2007/08 – 2009/10	2	34	36

Appendix 4: Socio-Economic Information

The nature of the economic impact to each fishery will partly depend on the characteristics of the fishery such as:

- The value of bluenose associated with each fishery (e.g., port price, export price and ACE price)
- The total number of fishers involved in the fishery
- The number of fishers that own quota vs. number that lease ACE
- Proportion of fishers that depend on bluenose landings (i.e., bluenose makes up the majority of their catch)

Table 16. Variation in economic indicators in last three fishing years.

	Ace Price (\$ per kg)		Port price (\$ per kg)	
	Min	Max	Min	Max
BNS1	1.46	1.92	4.70	4.73
BNS2	2.16	2.30	3.74	5.27
BNS3	0.79	1.07	3.74	4.73
BNS7	0.90	1.26	2.52	4.73
BNS8	0.88	1.19	3.74	4.73
Average	1.27	1.50	3.69	4.69

Table 17. Summary of annual export of bluenose. Note the years relate to the financial year running from 1 June to 30 May.

Year	Export Volume (t)	Export Value (\$NZ)
2006/07	1,414	\$13,094,535
2007/08	1,355	\$14,464,147
2008/09	1,261	\$14,444,121
2009/10	1,106	\$12,801,484
2010/11	1,067	\$12,639,502

Table 18. Characteristics of each QMA bluenose fishery.

	Commercial catch (t)	No. of vessels (No. of long line vessels)	No. of quota holders	No. of ace holders (no. that hold quota)
BNS1	665	31(27)	41	46 (6)
BNS2	845	31 (22)	51	42(8)
BNS3	419	27 (15)	78	46 (7)
BNS7	94	12 (9)	72	28 (3)
BNS8	36	5 (3)	51	4 (0)