

SUBMISSION BY INDUSTRY ON THE IPP ON ALL BLUENOSE STOCKS

Introduction

1. This submission has been developed by Fisheries Inshore New Zealand (FINZ) in collaboration with Southern Inshore Fisheries management Company Limited (Southern Inshore) on behalf of all bluenose (BNS) quota owners throughout country and across all Quota management Areas (QMAs) and industry organisations. There are 154 quota owners and 125 fishers involved in BNS fisheries.
2. FINZ is the Sector Representative Entity (SRE) for inshore finfish, pelagic and tuna fisheries of New Zealand. It was formed in November 2012 as part of the restructuring of industry organisations. It currently has 131 members with 99 quota owners and 32 fishers, with membership steadily increasing. Its role is to deal with national issues on behalf of the sector and to work directly with and behalf of its quota owners, fishers and affiliated Commercial Stakeholder Organisations (CSOs). As part of that work it will also work collaboratively with other industry organisations and SREs, Seafood New Zealand, Ministry for Primary Industries (MPI) and Department of Conservation. Its key outputs are the development of and agreement to appropriate policy frameworks, processes and tools to assist the sector to more effectively manage inshore, pelagic and tuna fishstocks, to minimise their interactions with the associated ecosystems and work positively with other fishers and users of marine space where we carry out our harvesting activities.
3. Responsibility for the implementation of these policies, processes and tools falls naturally on quota owners, fishers and CSOs who collectively choose the best ways to deal with particular issues in their region. CSOs will generally deal with all matters pertaining to fishstocks in their region. FINZ has the mandate to support this work where requested but does not have the ability to take on this work except where the fishery is managed as a single stock across the country. In that instance FINZ must work with all the relevant quota owners, fishers and CSOs in developing appropriate measures and submissions.
4. Bluenose is assessed as a single stock and managed at the QMA level. This makes responding to the IPP on BNS the responsibility of FINZ and FINZ has collaborated with Southern Inshore to ensure full representation of all BNS stocks are presented in the submission.
5. As noted elsewhere in this submission this has meant we have engaged with BNS quota owners, fishers and industry organisations to develop this response.

Summary of Submission

6. FINZ has prepared this submission on behalf of all BNS quota owners and fishers from all BNS QMAs. We strongly recommend that the Minister maintains the current Total Allowable Commercial Catches (TACCs) for all BNS stocks for the 2013-14 year. i.e. Option 1
7. We strongly recommend this option based on the following:
 - Catch rates in all BNS fisheries have rebounded in 2012/13. Reports from fishers of the increased catch rates were substantiated by updating the standardised Catch per Unit Effort (CPUE) indices which are used as abundance indices in bluenose stock assessment.
 - Catches in 2010/11 and 2011/12 were lower than estimated in the 2011 assessment and rebuild plan. Further projections using the 2011 assessment indicate that a one or two year delay in implementing the final catch reduction intended under the 2011 rebuild plan would have little impact on projected rebuild times, or the final level of catch required to achieve rebuilding within the $2 \times T_{\text{MIN}}$ guideline.
 - As a result, FINZ considers the stock could rebuild more rapidly than anticipated, or may be less depleted than the 2011 assessment indicated, and these should be explored full and with urgency.
 - Industry is aware of the risks that standardised CPUE indices may be influenced by process in addition to stock abundance (such as environmentally driven variation in catchability). It is recognised that further work is required before the improved catch rates can be confidently interpreted as evidence of stock rebuilding.
 - While advocating that the status quo catch limits should apply for 2013/14, FINZ and Southern Inshore also consider that further research is required to monitor to ensure that signs of rebuilding are real. Subject to the Minister maintaining the TACCs for all BNS QMAs at current TACC levels, FINZ and Southern Inshore will, on behalf of BNS quota owners, complete an updated stock assessment in 2013/14 alongside the further development and evaluation of management procedures, and ensure continued coordinated catch sampling for all BNS QMAs. It is proposed that this work will be assessed through the MPI inshore science working groups in accordance with the regular annual timetable in early 2014. Industry has the infrastructure in place to ensure cohesive coordinated action on these programmes across the country to the standards needed for robust results.
 - In addition FINZ will work with fishers, quota owners, CSOs and Licensed Fish Receivers (LFRs) to further enhance reporting from fishers on factors considered to have an impact on abundance and CPUE.
 - Another critical tool for managing fishstocks is the setting of deemed values (DVs) for the fishstock. These must be set at the appropriate level to constrain effort while allowing for utilisation but not be set too high as to provide perverse incentives. FINZ considers that the settings for BNS are generally appropriate across the QMAs. However recent events suggest that the more favourable DVs for landing BNS3 on the Chatham Islands warrant adjustment, given the activity in the fishery (and associated fishstocks eg ling and alfonsino) in that QMA and the commitment by all across the country to act with restraint and undertake measures to assist the recovery of the fishery. FINZ suggests that for fisheries under a rebuild regime there needs to be a different range of DV for those fisheries that should immediately apply to fishers where they continue to fish without ACE from the time the TACC is exceeded. We understand that Southern Inshore has expressed the same need for MPI to urgently address this anomaly with industry. FINZ and Southern Inshore offer to work with the Ministry on this urgently.

- As indicated by the plots in Appendix 1 of the MPI Initial Position Paper (IPP), further substantial reductions in the BNS TACC have significant implications for maintaining a bluenose target fishery. The final step down envisaged by the 2011 rebuild plan would result in further rationalisation in the domestic fleet harvesting BNS so that it would largely be a bycatch fishery in most QMAs.
- This would have the result in:
 - Loss of some markets for NZ BNS which, if the fishery is found to be stronger than thought, would be difficult to re-establish;
 - Not being able to maintain the CPUE series currently used to monitor stock abundance of BNS and make management decisions on the fishery.
- FINZ held a meeting of BNS fishers, quota owners and representatives from CSOs to discuss both the results of the additional analysis and the proposed programmes of research, analysis and sampling. That meeting involved quota owners and fishers from all QMAs with some being members of FINZ, some independents and others members of other industry organisations. Together they represented more than 75% of all BNS quota shares. The meeting unanimously supported the recommendation for the Minister to retain the current TACCs ie Option 1. Participants also agreed that they would fund and participate in the programmes summarised above and detailed below in a collaborative manner together and with MPI.

Ministry Initial Position Paper (IPP)

8. MPI issued the IPP on BNS fisheries in July 2013. The IPP included two options for consultation. They are:

- Option 1 retain the Total Allowable Catches (TACs), TACCs and all allowances (customary, recreational and other sources of mortality) in all QMAs at the same level in 2013/14 as this year; and
- Option 2 proceed with the 3rd set of cuts to the TACs, and TACCs while retaining the same level of allowances.

9. The TACCs for all BNS QMAs for the two options are:

Option	QMA1	QMA2	QMA3	QMA7	QMA8	NZ TOTAL*
1	400	438	171	62	29	1100
2	230	247	93	34	16	620
% reduction	43	44	46	45	45	44

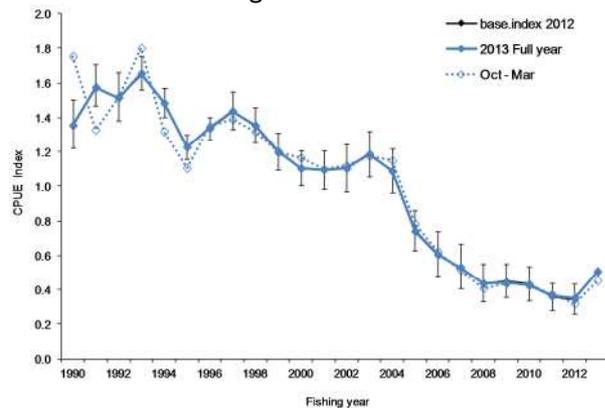
*These excludes 10 tonne in QMA10

10. The IPP notes that T_{MIN} was estimated in the 2011 stock assessment to be between 10 and 13 years. This means that, if the recovery of the fishery is to be consistent with the policy enunciated in the Ministry's Harvest Strategy Standard, for the rebuild time of the fishery to be equal to or less than $2X T_{MIN}$, the rebuild time for BNS will be between 20 and 26 years. The IPP further states until the Ministry has worked with stakeholders to agree what target biomass is appropriate for this fishery, the Ministry will use $40\%B_0$ as a proxy for B_{msy} .

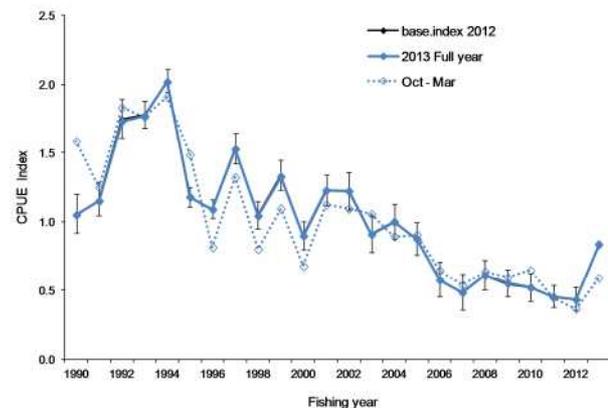
Which Option? -Recent bluenose catch rates

11. In response to reports from fishers of a significant increase in bluenose catch rates in all QMAs in the early part of the 2012/13 fishing year, FINZ commissioned an updated analysis of standardised catch per unit effort (CPUE). This work was coordinated by Seafood NZ and carried out by Terese Kendrick (Trophia) and Paul Starr (Starrfish). We also acknowledge MPI's data management group who made the data available in a timely manner.
12. The CPUE analysis was rapid update of the abundance indices used in the 2011 bluenose stock assessment, and used the same data preparation and standardisation methods. The analyses are documented in the Appendix, which provides both an overview and detailed diagnostics for the two indices.
13. While this CPUE analysis was primarily a routine update of existing accepted indices, it required some innovation to include data from the first six months of the 2013-14 fishing year, as the normal practice is to update analyses with data from complete fishing years only.
14. The process of CPUE standardisation is able to account for seasonal variation in catch rates and so standardised CPUE analyses do not necessarily require that full year data be available. The CPUE models for BNS typically do not find significant seasonal variation in catch rates and so do not include a term for the effect of month (see Starr & Kendrick, 2013, and the Appendix below).
15. Two approaches were undertaken to incorporate part year data from 2012/13:
 - (i) inclusion of the part-year data from 2012/13 alongside the full data from previous years; and
 - (ii) trimming the CPUE dataset to only include data from October-March in all fishing years.
16. In both approaches the CPUE analyses extended to 2012/13 yield similar year effects for all years (both the years with full year data, up to 2011/12, and the part year 2012/13). This gives some confidence that the early estimate of the index for 2012/13 from the data available from the start of the fishing year is unlikely to differ greatly from the index that would be obtained with the full year data included.
17. The updated indices indicate that standardised catch rates from both the bottom longline and trawl fisheries show a further slight decline in catch rate from 2009/10 to 2011/12, a pattern that is consistent with projections from the 2011 bluenose assessment. A significant increase in standardised catch rates evident in 2012/13 confirms the reports from industry, and is more pronounced than would be anticipated given projections of rebuilding of the stock – see figures below. The detailed analysis shown in figures 6 and 13 of the Appendix demonstrate the increase in catch rates is spatially widespread and evident across QMAs.

NZ wide bottom longline CPUE



NZ wide bottom trawl CPUE



Which Option? -Interpreting catch rates, and further planned research

18. Existing projections from the 2011 assessment model have been made with a deterministic recruitment assumption. If the upturn in CPUE in 2012/13 is interpreted solely as a change in stock abundance then, given the biological characteristics of bluenose, this would likely require a particularly strong year class (or classes) to be entering the fishery. There are some reports from fishers that support this hypothesis. Catch sampling data from industry are available, but have not yet been analysed (this will be carried out as part of the proposed assessment update – see below).
19. Alternative explanations for the increase in catch rates could include changes in fisher behaviour that may not be completely accounted for in the standardisation model, or environmentally driven variation in catchability.
20. The 2011 assessment model, which did not attempt to estimate variation in year class strengths but instead assumed deterministic recruitment, would be expected to interpret the updated CPUE index by fitting a smooth biomass trajectory through the CPUE series rather than simply indicating a rapid recent increase in abundance (this smoothing is clearly illustrated, for the 2011 assessment and CPUE series, in Figure 4 of Cordue and Pomarède, 2012). Thus, this increase in catch rates would likely affect the perception of the biomass trend over a number of recent years.
21. While the recent increase in catch rates is a positive sign, industry does not claim that it provides unambiguous evidence of stock rebuilding. Instead we propose, subject to the Minister confirming he will adopt Option 1 to retain the current TACCs in all QMAs, to undertake the programme of research detailed below to provide increased certainty of stock status as part of the 2014 stock assessment round, while also working towards the establishment of management decision rules that will allow for timely adjustments of catch limits in future:
 - **Management procedure evaluation:** Trident Systems has undertaken initial evaluation of management procedures for bluenose, based on the 2011 assessment – see Appendix. This was undertaken primarily as a case study for the “Rapid MPE” approach. However, FINZ recognises the desirability of ensuring that an appropriate management procedure is put in place for bluenose. We will work with MPI to ensure the use of the most current assessment information and models including the possible development

and adoption of an appropriate decision rule for future TACC adjustments are presented for peer review;

- **Updated stock assessment:** in parallel with the development of operating models for management procedure evaluation, FINZ proposes to provide updated stock assessment information during the 2014 “stock assessment working group round” so that it is available for the 2014 stock assessment plenary. It is anticipated that this work will include:
 - i. Further updating the CPUE series, including the full year data from 2012/13;
 - ii. Incorporation of new catch sampling data collected since 2011;
 - iii. Updating of the 2011 CASAL assessment with these revised data inputs, and other updates as necessary (e.g. approach to data weighting, use of the available biological data);
 - iv. Consideration of alternative assessment approaches including Bayesian surplus-production models;

For 2014, FINZ anticipates that assessment and MPE modelling will continue to focus on models that assume a single NZ-wide biological stock of bluenose unless early results from the catch sampling set out below proposes finer assessment at a regional level.

- **Catch sampling:** FINZ proposes to undertake representative sampling of all BNS fishstocks. This will require coordination of sampling across all QMAs so that it is coherent, consistent and robust. FINZ notes that any single year of catch sampling has limited impact on stock assessment results, and that only samples from the early part of the 2013/14 fishing year can contribute to assessment results by May 2014. However, bluenose quota owners, fishers and LFRs also consider that undertaking on-going, representative sampling of bluenose is important to address medium term management information needs, including estimating variations in year class strength and improved understanding of stock structure.

22. A further part-year update of standardised CPUE, to March 2014, will also be undertaken if required.

Which Option? -Updated projections

23. The three year catch reduction programme put in place in 2011 was informed by projections made from the 2011 assessment model. These indicated that the planned changes would rebuild bluenose stocks to the target of 40% B_0 within $2xT_{MIN}$ (where T_{MIN} is the rebuilding time in the absence of any catch).
24. If, after completion of an updated stock assessment, the upturn in CPUE observed in 2012/13 is not considered to indicate rebuilding or an otherwise improved current stock status, then delays in reducing catches in 2013-14 and possibly beyond could potentially impact on the intended rebuilding timeframe.

25. However, commercial catches of bluenose reduced quicker than anticipated in the 2011 assessment. That assumed a 2010/11 (commercial) catch of 2000 t, and the TACC for 2011/12 was set at 1580 t. However MPI (2013) data indicate that actual commercial catches were 1696 t in 2010/11 and 1218 t in 2011/12 leaving more biomass in the water than the 2011 assessment assumed.

26. To assess the consequences for the planned rebuilding plan, FINZ contracted Patrick Cordue (who carried out the original assessments and projections) to carry out some further projections with the 2011 assessment model. Four new commercial catch scenarios were compared with the 2011 rebuild plan:

Year	2011 rebuild plan	2013 scenario 1	2013 scenario 2	2013 scenario 3	2013 scenario 4
2010/11	2000*	1696†	1696†	1696†	1696†
2011/12	1580**	1218†	1218†	1218†	1218†
2012/13	1100	1100	1100	1100	1100
2013/14	620	620	1100	1100	1100
2014/15	620	620	620	1100	1100
2015/16 onwards	620	620	620	620	1100

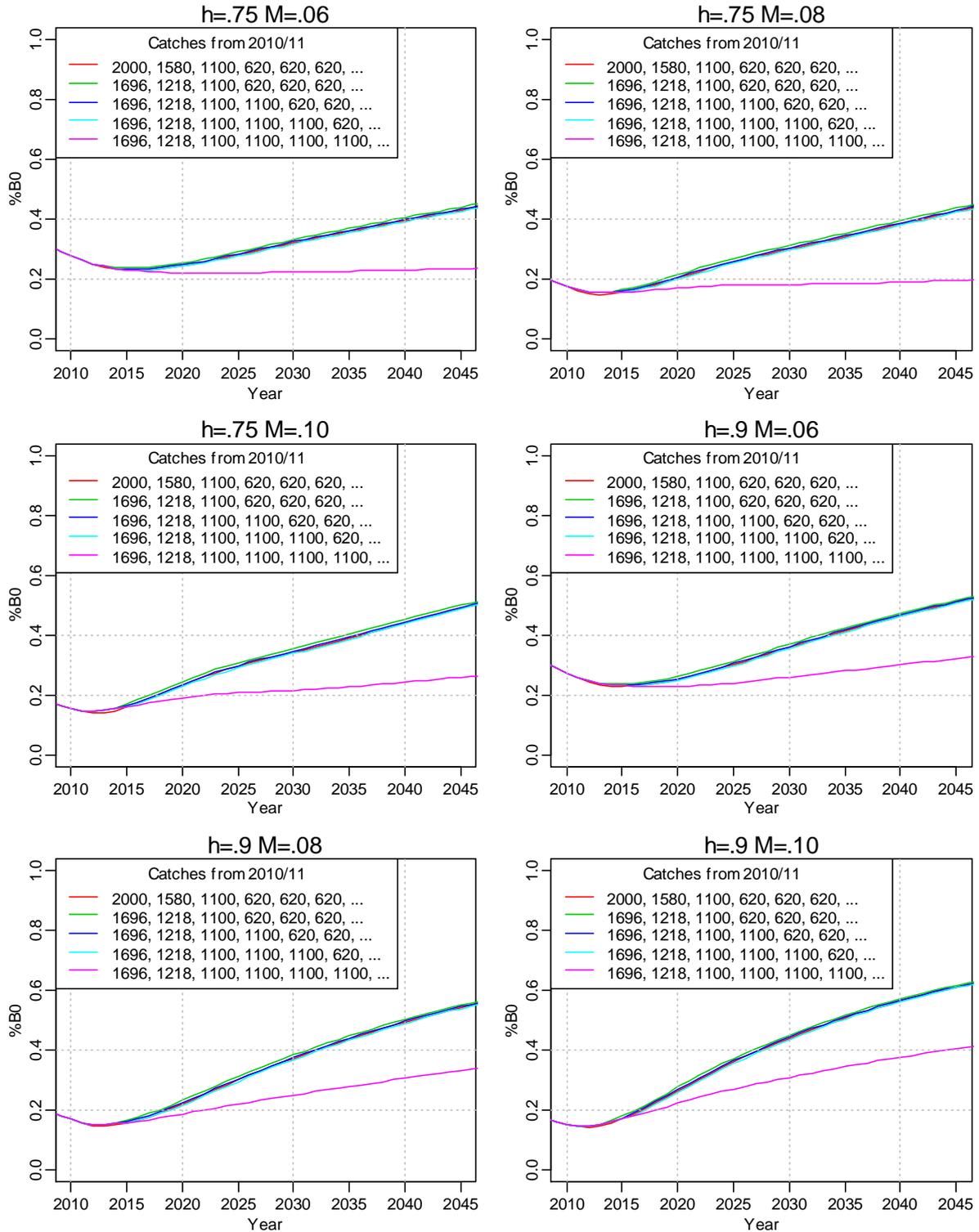
* 2010/11 catch assumed in the 2011 assessment

** TACC in 2011/12

† Actual catches in 2010/11 and 2011/12

27. As was the case in 2011, projections were carried out for three values of natural mortality (0.6, 0.8, 0.1) and two values of stock recruit steepness (0.75, 0.9).

28. The lower than anticipated catches in 2010/11 and 2011/12 have the consequence that the projected stock abundance drops slightly less before rebuilding, and rebuilds slightly faster, than was anticipated under the catch scenario assumed for the 2011 rebuild plan.



29. The projections also demonstrate that maintaining the current TACC (1100 t) for an additional one or two years has no significant effect on the projected rebuild trajectory. As illustrated above, the projected stock trajectories are virtually indistinguishable for scenarios 1 to 3. It is only when the status quo TACC of 1100 t is maintained indefinitely (scenario 4) that there is a clear delay in the stock rebuilding.

30. The projections also indicate that a one or two year delay in implementing the final stage of the 2011 rebuild plan, should an updated assessment confirm that stage is still required, would not

require catches to be reduced substantially below the 620 t TACC endpoint envisaged in the 2011 plan, and so does not exacerbate any difficulties in bycatch management beyond those already envisaged by the 2011 rebuild plan.

31. Based on all the above FINZ therefore recommends on behalf of all BNS quota owners and fishers in all QMAs that the Minister approve a continuation of the status quo ie retain the current TACCs totalling 1100 tonne for the 2013-14 fishing year. If the Minister so agrees, industry will then carry out the programmes set out above.

Improved Information

32. Part of the analysis set out in the Appendix examined whether, with the substantial reductions in TACC over the years, there remained sufficient number of core vessels in each fishing area to remain confident about the robustness of the data from the fleet. In all cases at the TACC for 2012-13 in each QMA, sufficient core vessels are still active.
33. As both part of the earlier analysis and subsequent discussion with fishers in particular (but also with CSOs, quota owners and LFRs), suggestions have been offered on a number of other factors that affect the CPUE from a vessel but which are not fully captured in current reporting. These include details of the set and conditions prevailing at the time along with other factors that may affect the final CPUE including depredation of catch by orca.
34. With the latter, it was noted that rather than the 1 pod of orca that existed 10 years ago, there are now at least 3 pods and each is experienced in extracting the catch they want from fishing gear. It is claimed that in many cases particularly in BNS1 the pressure is sufficiently intense to require fishers to avoid sites of previously high CPUE because fishing at those sites now would result in high levels of damage to fishing gear and damaged fish that are no longer saleable (usually only lips or heads remain). It was also noted that the orca are also now sufficiently aware of both the patterns of catching and gear that the orca swim ahead of the vessels and are waiting well positioned and ready to harvest when the next set is lifted. Orca have also been observed 'training' their young on how to best remove fish from sets. Fine scale spatial changes in fishing in response to avoidance of orca depredation are not currently well represented in CPUE analyses.
35. In other cases where boats are trying to target a range of species to better match their catch plan, fishers are making changes to gear and practices to reduce catches of BNS in favour of other species. Current effort and target species recording does not capture fine scale data on fishing practices.
36. As part of FINZ's commitment to improve management of our inshore fisheries by assisting gathering of better quality information, we will work with fishers, quota owners, CSOs and LFRs to further enhance reporting and any other factors considered to have an impact on CPUE and our resultant understanding of bluenose abundance.

Deemed Values

37. Another critical tool that assists management and sustainability of fishstocks is the use of deemed values (DV) for the fishstock. DVs should be set at the same time as decisions on the TACC. They must be set at an appropriate level that allows utilisations but where necessary constrains effort without being set so high as to provide perverse incentives. FINZ considers that

the current settings for BNS are generally appropriate across the QMAs.

38. However recent events suggest that the lower DVs for landing BNS3 on the Chatham Islands warrants adjustment, given the state of the fishery in that QMA and the commitment by all across the country to act with restraint and undertake measures to assist the recovery of the BNS fishery.
39. The TACC for BNS3 is 171 tonnes. As at 22nd August based on reporting to the end of July, the total reported catch is 218.9 tonnes – the fishery that is meant to be in a rebuild phase is 27.4% over caught, 2 months before the end of the year. With the current catch already exceeding the TACC, there is no ability for some fishers to be able to purchase sufficient ACE to balance their catch and they will either be paying the annual DV rate or, if they are well in excess of the ACE they have obtained at year end, the ramped penalty rates.
40. When this is examined further it appears that a high percentage of the over-catch is by a small number of operators who appear to be fishing in a different manner to previous years and landing the BNS into the Chatham Islands. Such practices cannot be condoned in the light of the requirement to act to rebuild the BNS fishery.
41. In recognition of the additional transport costs that fall on the products from the Chatham Islands in getting them to the market, DVs for fishstocks landed in the Chathams are substantially lower than elsewhere in the associated QMAs. For BNS3 the deemed values are:

BNS3	Chatham Islands	Elsewhere in BNS3 QMA
Interim value	\$0.53	\$2.70
Annual value	\$1.05	\$3.00
Ramped rate	\$2.10 when 200% greater than ACE	\$10 when 60% greater than ACE

42. At present for some operators, these DV differentials in the Chathams for BNS3 do not appear to provide sufficient deterrent to restrain catch even when those operators have catch well excess in the ACE they hold. On-going activity indicates it is cash positive for the operators concerned. This activity obviously acts against the combined efforts of all other quota owners and fishers committed to rebuilding the fishery. FINZ considers the actions of the few must not be able to compromise the positive efforts of many in this shared resource. The current DV settings for BNS3 in the Chathams cannot be left unchanged as it is not only obviously lucrative for those currently involved, it also creates unhealthy incentives for others to take advantage of the conditions.
43. FINZ suggests that for fisheries under a rebuild regime there needs to be a different range of DVs for those fisheries that should immediately apply to fishers where they continue to fish without ACE from the time the TACC is exceeded. FINZ and Southern Inshore offer to work with the Ministry to urgently address this anomaly.

Support

44. In addition to our workshop earlier in the year where BNS was discussed, FINZ held a meeting in Auckland on 9th August with BNS fishers, quota owners and representatives from CSOs to discuss both the results of the additional analysis and the proposed programmes of research, analysis and sampling.

45. That meeting involved quota owners and fishers from all QMAs with some members of FINZ, some independents and others members of other industry organisations including Area2 and Southern Inshore. Together those present and the proxies they held represented more than 75% of all BNS quota shares.
46. The meeting unanimously supported the recommendation for the Minister to retain the current TACCs as per Option 1. It also discussed in some detail the programmes of analysis, evaluation and catch sampling set out above and unanimously agreed that, if the Minister agreed to Option 1, it would fund and participate in those programmes.
47. In addition we have had no opposition from any quota owners in any discussion about supporting Option 1 or a commitment to participate in industry programmes as set out above. A number of quota owners not involved in the meeting of 9th August have subsequently pledged their support. We consider this to be a unified industry position.
48. FINZ supports the submission from the Southern Inshore Fisheries Management Company and Area 2 Inshore finfish Management Company.
49. FINZ proposes to continue working collaboratively with quota owners, fishers, CSOs and MPI to ensure all BNS stocks are well represented and managed and programmes agreed to are delivered to the standards required.

Why not Option2

50. FINZ and Southern Inshore oppose the Minister adopting Option 2.
51. Option 2 would reduce the TACC for all BNS fishstocks from 1100 greenweight tonnes (gwt) down to 620 tonne – a 480 tonne or 44% reduction. The IPP states that this will be at a loss to New Zealand of approximately \$4m in export returns and a number of jobs.
52. We are in an asymmetric situation where under Option1- the deferral of any cut for a year - makes no significant difference in the recovery of the fishery but under Option2 -cutting the TACC - is likely to immediately result in loss of some markets for NZ bluenose that have been gradually developed but must continue to be served in suitable quantities to be secure. Moreover as the industry knows, even if in a year's time the fishery is found to be stronger than thought, such markets would be very difficult to re-establish and would have reduced earnings.
53. In addition, cuts to the levels set out in Option 2 would quickly mean that most, if not all, BNS fisheries would become bycatch fisheries. FINZ is concerned that this will impact on maintaining the catch per unit effort series that are currently used to monitor stock abundance of bluenose and make management decisions on the fishery. That could then mean industry would be locked out of a recovering or strong fishery as there would be no robust information to demonstrate the state of the fishery and adjust the TACC back up.
54. It is also likely that a number of boats will transfer the focus of their harvesting on to other stocks. As most other fishstocks are already fully caught, this will only increase the competition to catch those stocks with more and more boats chasing in total fewer fish.
55. There is not the capacity for all fishers to economically harvest. With severely reduced fishing options available, many fishers will be forced to leave the industry. Resale value and potential

for their vessel and operations is compromised, potentially leaving fishers to forfeit on Mortgages and loans. Fishers with suitable tickets, may be able operate tugs or use their skills for charter fishing, however other experienced skippers and crew will be lost to other industries for good. Replacing this capacity and experience will be a very difficult task.

56. Option 1 is a 'no regrets' option. Option 2 however has substantial costs across a number of dimensions and is not needed immediately to ensure the recovery of the fishery. We therefore reject option 2.

Conclusion and Recommendations

57. With the analyses presented in this submission and the commitment of industry to maintain a high level of sampling and monitoring for all BNS stocks we consider that the Minister has the best available information to make a decision to adopt Option 1 and retain the current TACC levels for all BNS stocks for the 2013/14 fishing year
58. The analysis shows that CPUE in all QMAs increased in the first six months of the 2012-13 fishing year suggesting that the fishery could be in better condition than the 2011 assessment projections.
59. Industry proposes that if the TACC is held at current levels, we will undertake an updated stock assessment in 2013/14 alongside the further development and evaluation of management procedures, and continue coordinated catch sampling for all BNS QMAs, all of which will provide better information to manage the fishery.
60. By retaining the current TACC levels there remains sufficient ACE to retain target fisheries for the core fleet ensuring their ability to maintain the CPUE series used to monitor the state of the fishery.
61. Part of the analysis provided in this submission shows that, if after the updated assessment in 2014, it is necessary to proceed with further cuts in the TACC, retaining the TACC at current levels for the 2013-14 year will have negligible effect on the rebuild of the fishery.
62. As the IPP also notes, this option obviously provides the greatest economic and social returns to New Zealand.
63. Option 2 on the other hand reduces export returns and jobs with flow –on heavier impacts on other fisheries and the loss of the ability to monitor the bluenose fishstock. Moreover it is an unnecessary early cut to the TACC that forgoes positive opportunities without significant gain in the rebuild of the fishery when it can be seen from our analysis that Option 1 (retaining the current TACCs for another year) doesn't significantly change the rebuild time for the fishery.

Rapid Update of Catch Per Unit Effort Indices for Bluenose

Therese Kendrick

with associated attachments

CPUE for Bluenose from bottom longline targeting bluenose, hapuku/bass or Ling

Terese Kendrick & Paul Starr &

CPUE for Bluenose from bottom trawl targeting bluenose or alfonsino

Terese Kendrick & Paul Starr

Management procedure evaluation for the New Zealand bluenose fishery

Nokome Bentley, Trophia Ltd

References

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