



Monterey Bay Aquarium Seafood Watch®

Antarctic Butterfish (Bluenose)

Hyperoglyphe antarctica



Image © New Zealand Fishing News

New Zealand

Bottom longline, Bottom trawl

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Disclaimer

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About Seafood Watch®

Monterey Bay Aquarium's Seafood Watch® program evaluates the ecological sustainability of wild-caught and farmed seafood commonly found in the United States marketplace. Seafood Watch® defines sustainable seafood as originating from sources, whether wild-caught or farmed, which can maintain or increase production in the long-term without jeopardizing the structure or function of affected ecosystems. Seafood Watch® makes its science-based recommendations available to the public in the form of regional pocket guides that can be downloaded from www.seafoodwatch.org. The program's goals are to raise awareness of important ocean conservation issues and empower seafood consumers and businesses to make choices for healthy oceans.

Each sustainability recommendation on the regional pocket guides is supported by a Seafood Report. Each report synthesizes and analyzes the most current ecological, fisheries and ecosystem science on a species, then evaluates this information against the program's conservation ethic to arrive at a recommendation of "Best Choices," "Good Alternatives" or "Avoid." The detailed evaluation methodology is available upon request. In producing the Seafood Reports, Seafood Watch® seeks out research published in academic, peer-reviewed journals whenever possible. Other sources of information include government technical publications, fishery management plans and supporting documents, and other scientific reviews of ecological sustainability. Seafood Watch® Research Analysts also communicate regularly with ecologists, fisheries and aquaculture scientists, and members of industry and conservation organizations when evaluating fisheries and aquaculture practices. Capture fisheries and aquaculture practices are highly dynamic; as the scientific information on each species changes, Seafood Watch®'s sustainability recommendations and the underlying Seafood Reports will be updated to reflect these changes.

Parties interested in capture fisheries, aquaculture practices and the sustainability of ocean ecosystems are welcome to use Seafood Reports in any way they find useful. For more information about Seafood Watch® and Seafood Reports, please contact the Seafood Watch® program at Monterey Bay Aquarium by calling 1-877-229-9990.

Guiding Principles

Seafood Watch defines sustainable seafood as originating from sources, whether fished¹ or farmed, that can maintain or increase production in the long-term without jeopardizing the structure or function of affected ecosystems.

Based on this principle, Seafood Watch had developed four sustainability **criteria** for evaluating wild-catch fisheries for consumers and businesses. These criteria are:

- How does fishing affect the species under assessment?
- How does the fishing affect other, target and non-target species?
- How effective is the fishery's management?
- How does the fishing affect habitats and the stability of the ecosystem?

Each criterion includes:

- Factors to evaluate and score
- Guidelines for integrating these factors to produce a numerical score and **rating**

Once a rating has been assigned to each criterion, we develop an overall recommendation. Criteria ratings and the overall recommendation are color-coded to correspond to the categories on the Seafood Watch pocket guide and the Safina Center's online guide:

Best Choice/Green: Are well managed and caught in ways that cause little harm to habitats or other wildlife.

Good Alternative/Yellow: Buy, but be aware there are concerns with how they're caught.

Avoid/Red: Take a pass on these for now. These items are overfished or caught in ways that harm other marine life or the environment.

¹ "Fish" is used throughout this document to refer to finfish, shellfish and other invertebrates.

Summary

This report assesses the sustainability of Antarctic butterfish, more commonly referred to as bluenose (*Hyperoglyphe antarctica*). The report scope includes bluenose landed using the bottom trawl, midwater trawl, and bottom longline fishing methods from quota management areas (QMAs) BNS1 (Bluenose 1) and BNS2 (Bluenose 2) in New Zealand fisheries waters.

Inherent vulnerability of bluenose is classified as 'medium.' Administrative boundaries divide the geographic areas in which bluenose is harvested, although New Zealand fisheries waters are thought to contain a single stock. Stock assessment showed an ongoing decline in stock biomass trajectories from the 1980s to 2011. Following this assessment, reductions in catch limits were instigated. Bluenose is currently considered unlikely ($P < 0.4$) to be below the hard limit for management (10% of B_0), but as likely as not to be above the soft limit (20% of B_0). Fishing mortality has not been estimated.

Fish catch landed from bluenose fishing comprises almost all retained species. This is due to the large number of commercial species included under the 'quota management system' (QMS). Knowledge of stock status and fishing mortality is variable for retained species. Almost all bycatch species are caught in very low amounts (<1% of the total catch). The exception is southern boarfish in the bottom trawl fishery of BNS1. This fish was the only 'main' bycatch species by volume; its stock status and the sustainability of catch have not been assessed. Seabirds are at risk of capture in trawl and longline fisheries for bluenose, including albatrosses and petrels classified as 'vulnerable' by the IUCN. Some seabirds at risk of capture during bluenose fishing have been identified as New Zealand-wide bycatch risks at levels likely in excess of their sustainability limits. Two species of dolphins may be at risk of capture in bluenose trawls, but they are not of conservation concern. Benthic invertebrates, corals, and sponges have also been returned (by government observers) from bottom fishing gear catching bluenose. Discards for all methods assessed here comprise <10% of catch by weight.

Legislative and policy frameworks are generally robust for the harvest of bluenose, but a lack of quantitative data on retained species caught alongside bluenose, and bycatch species, limits management efficacy. Stock assessments are available for some retained species. Observer coverage of vessels catching bluenose is highly variable and generally focused on the larger vessels, which tend to fish offshore. Where coverage does occur however, data collection is robust and can be used for enforcement purposes. Opportunities are extensive for stakeholder involvement in the management of bluenose fishing activity (e.g., through working groups and public consultations). Management decision-making involves a significant amount of consultation and the promulgation of decision papers.

Bottom trawling and longlining for bluenose occurs in habitats that include those supporting communities of habitat-creating organisms (e.g., corals). The amount of fishing is managed through catch limits although there are no effort restrictions (e.g., on numbers or durations of longline hooks/sets or trawl tows) in place. Some benthic protection occurs nationwide through the exclusion of bottom trawling from designated areas. These areas include parts of the bluenose quota management areas (QMAs) assessed here, but are not representative of habitat types within those QMAs. Considering ecosystem effects is a specific component of the management approach but work has not been focused on bluenose per se. Some ecosystem components are managed across New Zealand fisheries (e.g., seabirds) for which bycatch reduction measures are required on all trawlers ≥ 28 m and bottom longliners.

Table of Conservation Concerns and Overall Recommendations

| Stock / Fishery | Impacts on the Stock | Impacts on other Spp. | Management | Habitat and Ecosystem | Overall Recommendation |
|---|----------------------|-----------------------|---------------|-----------------------|-------------------------------------|
| Bluenose New Zealand: BNS1 Southern Ocean - Longline, Bottom | Yellow (2.64) | Red (1.41) | Yellow (3.00) | Yellow (2.83) | Good Alternative (2.373) |
| Bluenose New Zealand: BNS2 Southern Ocean - Longline, Bottom | Yellow (2.64) | Red (1.41) | Yellow (3.00) | Yellow (2.83) | Good Alternative (2.373) |
| Bluenose New Zealand: BNS1 Southern Ocean - Trawl, Bottom | Yellow (2.64) | Red (1.41) | Yellow (3.00) | Red (1.00) | Avoid (1.830) |
| Bluenose New Zealand: BNS2 Southern Ocean - Trawl, Bottom | Yellow (2.64) | Red (1.41) | Yellow (3.00) | Red (1.00) | Avoid (1.830) |
| Bluenose New Zealand: BNS1 Southern Ocean - Trawl, Midwater | Yellow (2.64) | Red (1.41) | Yellow (3.00) | Green (4.47) | Good Alternative (2.661) |
| Bluenose New Zealand: BNS2 Southern Ocean - Trawl, Midwater | Yellow (2.64) | Red (1.41) | Yellow (3.00) | Green (4.47) | Good Alternative (2.661) |

Scoring Guide

Scores range from zero to five where zero indicates very poor performance and five indicates the fishing operations have no significant impact.

Final Score = geometric mean of the four Scores (Criterion 1, Criterion 2, Criterion 3, Criterion 4).

- **Best Choice/Green** = Final Score >3.2, **and** no Red Criteria, **and** no Critical scores
- **Good Alternative/Yellow** = Final score >2.2-3.2, **and** neither Harvest Strategy (Factor 3.1) nor Bycatch Management Strategy (Factor 3.2) are Very High Concern², **and** no more than one Red Criterion, **and** no Critical scores
- **Avoid/Red** = Final Score ≤2.2, **or** either Harvest Strategy (Factor 3.1) or Bycatch Management Strategy (Factor 3.2) is Very High Concern **or** two or more Red Criteria, **or** one or more Critical scores.

² Because effective management is an essential component of sustainable fisheries, Seafood Watch issues an Avoid recommendation for any fishery scored as a Very High Concern for either factor under Management (Criterion 3).

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Introduction

Scope of the analysis and ensuing recommendation

This report assesses the sustainability of bluenose (*Hyperoglyphe antarctica*) fisheries in accordance with the criteria established by the Seafood Watch program. The report scope includes bluenose landed using the bottom trawl, midwater trawl, and bottom longline fishing methods from quota management areas Bluenose 1 (BNS1) and Bluenose 2 (BNS2) in New Zealand fisheries waters. (Under the New Zealand Quota Management System, allowable catches are partitioned into areas based on species caught and geographic locations).

Overview of the species and management bodies

Bluenose occur from near-surface waters down to depths of approximately 1,200 m. They are most frequently found at 250 m – 750 m (Anderson, O. et al. 1998). Depths occupied appear to increase with age (Ministry for Primary Industries 2012). Bluenose is a long-lived species. Maximum age has been estimated at 76 years with natural mortality rates (M) estimated at 0.09 – 0.1. Maturity is estimated at 17 years for 50% of females, and 15 years for 50% of males (Horn and Sutton 2011). The location of spawning grounds is unknown, although reproductively active fish are widespread from the north to the south of New Zealand. Stock boundaries are also uncertain, although current knowledge supports the existence of one stock across all fished areas (Ministry for Primary Industries 2012). Diet of the species is not well known in New Zealand, but work in eastern Australia has found that the tunicate *Pyrosoma atlanticum* is a particularly important prey, and bluenose also prey on crustaceans, squid, and finfish (Winstanley, R. 1978 cited by Goldman, S. and Sedberry, G. 2011). Predators include fish (e.g., finfish, elasmobranchs (Froese, R. and D. Pauly 2011)) and marine mammals (e.g., orca (*Orcinus orca*) and Australian fur seal (*Arctocephalus pusillus*) (Gales, N. et al. 2003; Ministry for Primary Industries 2012)).

Commercial bluenose fishing in New Zealand is managed by the Ministry for Primary Industries under the Fisheries Act (1996). The purpose of the Fisheries Act is to provide for fishery utilization (social, cultural, economic) while ensuring sustainability. Sustainability is interpreted in the Fisheries Act as:

- “maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and,
- avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.”

The Quota Management System (QMS) limits total commercial catches in accordance with specified areas. Quota owners can buy, sell and lease their quota, and are free to choose when and where (within the boundaries of the specified quota management area, Figure 1) they harvest. Quota ownership is made operational through 'total allowable commercial catches' (TACCs), which are reviewed annually (Clement and Associates 2011). The QMS does not dictate the fishing gear that must be used to harvest the stocks targeted.

Bluenose have been landed in New Zealand since the 1930s, although the target fishery did not develop until the 1970s when the species began to be taken by trawling off the east coast of North Island. The majority of bluenose is caught in fisheries targeting bluenose and alfonsino (*Beryx splendens*, *B. decadatylus*) (Ministry for Primary Industries 2012); reported catch and bycatch from these fisheries is considered in this report where bluenose comprised $\geq 5\%$ of the total catch weight in any one fishing year (1 October 2007/08 – 30 September 2011/12). Smaller amounts of bluenose are also landed as non-target catch in fisheries for other commercial species such as hoki (*Macraronus novaezelandiae*), ling (*Genypterus blacodes*) and hapuku (*Polyprion oxygeneios*). Catch limits have been in place for this species since 1986 (Ministry for Primary Industries 2012).

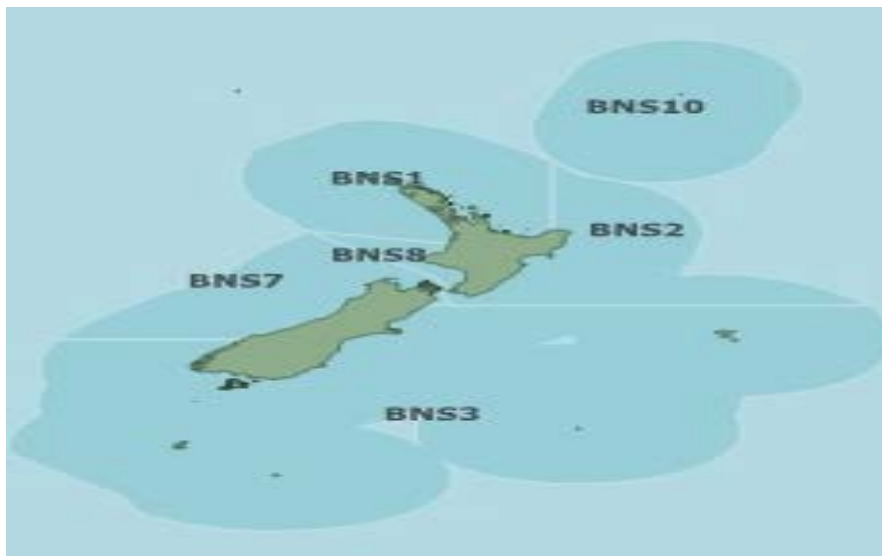


Figure 1. Quota Management Areas used for managing bluenose (BNS).

Source: <http://fs.fish.govt.nz/Page.aspx?pk=7&sc=BNS>

Production Statistics

New Zealand dominates global catch of this species, as reported by the FAO (Saebni, F. and Calderini, F. 2012). Between 2000 and 2010, the average annual catch reported by New Zealand was 2723 metric tonnes. Small catches have been reported for a single year each by Uruguay (56 tons in 2005) and the Cook Islands (384 tons in 2010) (Saebni, F. and Calderini, F. 2012, Figure 2). In Australia, the species is caught as the blue eye trevella and is primarily for domestic use (Ish, T. and Doctor, K. 2006) in the Southern and Eastern Scalefish and Shark Fishery. Annual catch limits have reduced from 785 tons in 2007, to 388 tons in 2012 (<http://www.afma.gov.au/home/afma-archives/historical-total-allowable-catch-and-effort/>).

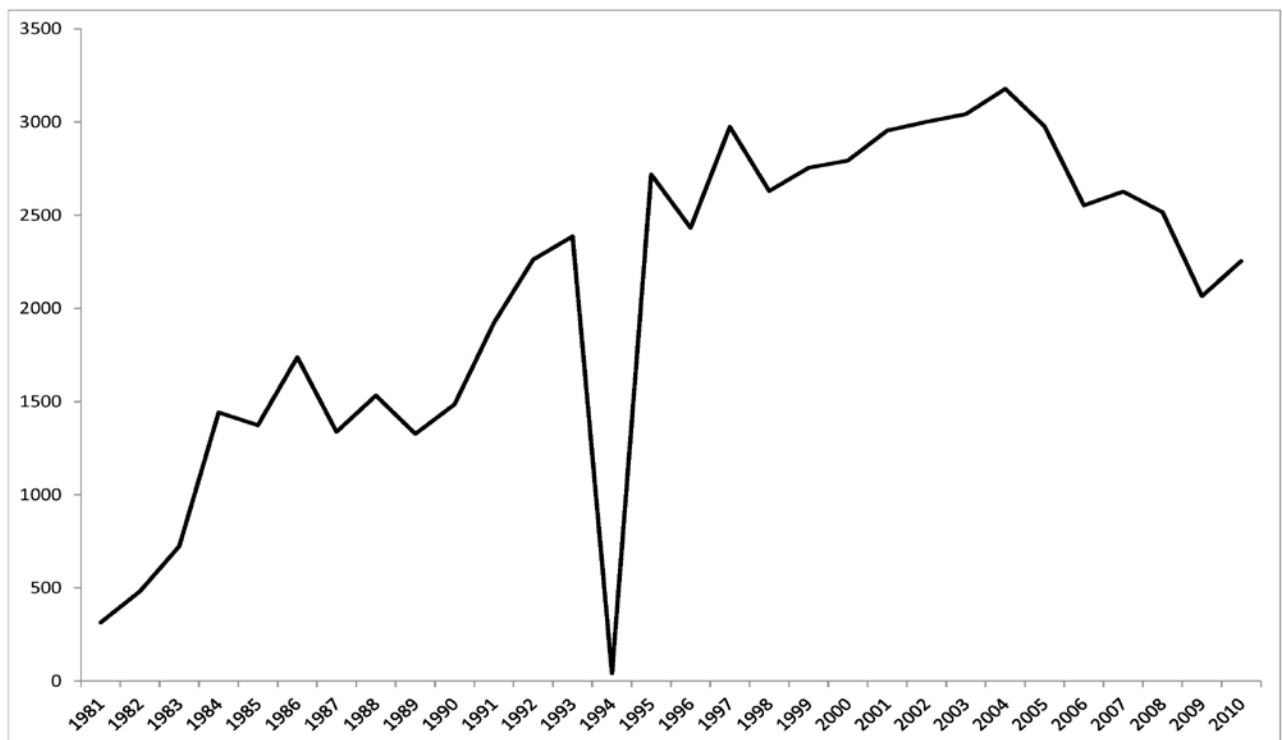


Figure 2. Catches (tons) of bluenose warehou (BWA) reported to the FAO by New Zealand (Saebni, F. and Calderini, F. 2012). Note that catches reported early in this series are considered imprecise (Ministry for Primary Industries 2012).

Importance to the US/North American Market

US imports of bluenose from New Zealand amounted to approximately 410 – 490 tons annually from 2000 to 2008 (Statistics New Zealand 2009).

Common and Market Names

Bluenose warehou is the most common name used globally for this species, including by the FAO (Saebni, F. and Calderini, F. 2012). Other names include: Antarctic butterfish, big-eye, blue eye cod, blue eye trevella, bluenose, bluenose, bluenose sea bass, bluenose warehou, bonita, bream, deep sea trevally, deep sea trevalla, Griffin's silver fish, matiri, sea trevally, stone eye, and trevalla

(http://en.wikipedia.org/wiki/Antarctic_butterfish; <http://wildfish.co.nz/portfolio/2blue-nose/>; Froese, R. and D. Pauly 2011).

Primary Product Forms

Bluenose is available fresh and frozen as fillets, headed and gutted, or whole

(<http://wildfish.co.nz/portfolio/2blue-nose/>; <http://www.seafooddepot.ca/product-Bluenose>; <http://www.seattlefishnm.com/products/factsheets/bluenose-sea-bass>).

Assessment

This section assesses the sustainability of the fishery(s) relative to the Seafood Watch Criteria for Fisheries, available at <http://www.seafoodwatch.org>.

Criterion 1: Impacts on the species under assessment

This criterion evaluates the impact of fishing mortality on the species, given its current abundance. The inherent vulnerability to fishing rating influences how abundance is scored, when abundance is unknown.

The final Criterion 1 score is determined by taking the geometric mean of the abundance and fishing mortality scores. The Criterion 1 rating is determined as follows:

- Score >3.2=Green or Low Concern
- Score >2.2 and <=3.2=Yellow or Moderate Concern
- Score <=2.2=Red or High Concern

Rating is Critical if Factor 1.3 (Fishing Mortality) is Critical.

Criterion 1 Summary

| BLUENOSE | | | | |
|---|------------------------|-----------------------|-----------------------|-----------------------|
| Region / Method | Inherent Vulnerability | Stock Status | Fishing Mortality | Subscore |
| New Zealand: BNS1 Southern Ocean Longline, Bottom | 2.00:Medium | 3.00:Moderate Concern | 2.33:Moderate Concern | Yellow (2.644) |
| New Zealand: BNS1 Southern Ocean Trawl, Bottom | 2.00:Medium | 3.00:Moderate Concern | 2.33:Moderate Concern | Yellow (2.644) |
| New Zealand: BNS1 Southern Ocean Trawl, Midwater | 2.00:Medium | 3.00:Moderate Concern | 2.33:Moderate Concern | Yellow (2.644) |
| New Zealand: BNS2 Southern Ocean Longline, Bottom | 2.00:Medium | 3.00:Moderate Concern | 2.33:Moderate Concern | Yellow (2.644) |
| New Zealand: BNS2 Southern Ocean Trawl, Bottom | 2.00:Medium | 3.00:Moderate Concern | 2.33:Moderate Concern | Yellow (2.644) |
| New Zealand: BNS2 Southern Ocean Trawl, Midwater | 2.00:Medium | 3.00:Moderate Concern | 2.33:Moderate Concern | Yellow (2.644) |

Maximum age has been estimated at 76 years with natural mortality rates (M) estimated at 0.09 – 0.1. Maturity is estimated at 17 years for 50% of females, and 15 years for 50% of males (Horn and Sutton 2011). Inherent vulnerability of bluenose is classified as ‘medium.’

Administrative boundaries divide the geographic areas in which bluenose is harvested, although New Zealand fisheries waters are thought to contain a single stock. The stock assessment showed an ongoing decline in stock biomass trajectories from the 1980s to 2011. Following this assessment, reductions in catch limits were instigated. Bluenose is currently considered unlikely ($P < 0.4$) to be below the hard limit for management (10% of B_0), but as likely as not to be above 20% of B_0 (defined as the theoretical carrying capacity of the recruited or vulnerable biomass of a fish stock, Ministry of Fisheries 2008). Fishing mortality has not been estimated.

Criterion 1 Assessment

BLUENOSE

Factor 1.1 - Inherent Vulnerability

Scoring Guidelines

- *Low—The FishBase vulnerability score for species is 0-35, OR species exhibits life history characteristics that make it resilient to fishing, (e.g., early maturing).*
- *Medium—The FishBase vulnerability score for species is 36-55, OR species exhibits life history characteristics that make it neither particularly vulnerable nor resilient to fishing, (e.g., moderate age at sexual maturity (5-15 years), moderate maximum age (10-25 years), moderate maximum size, and middle of food chain).*
- *High—The FishBase vulnerability score for species is 56-100, OR species exhibits life history characteristics that make it particularly vulnerable to fishing, (e.g., long lived (>25 years), late maturing (>15 years), low reproduction rate, large body size, and top-predator).*

Note: The FishBase vulnerability scores is an index of the inherent vulnerability of marine fishes to fishing based on life history parameters: maximum length, age at first maturity, longevity, growth rate, natural mortality rate, fecundity, spatial behaviors (e.g., schooling, aggregating for breeding, or consistently returning to the same sites for feeding or reproduction) and geographic range.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Medium

Bluenose is a long-lived species. Maximum age has been estimated at 76 years with natural mortality rates (M) estimated at 0.09 – 0.1. Maturity is estimated at 17 years for 50% of females, and 15 years for 50% of males (Horn and Sutton 2011). For bluenose, the FishBase vulnerability score is 51 out of 100 (Froese & Pauly 2012), therefore Seafood Watch considers vulnerability to be ‘medium.’

Factor 1.2 - Stock Status

Scoring Guidelines

- *5 (Very Low Concern)—Strong evidence exists that the population is above target abundance level (e.g., biomass at maximum sustainable yield, BMSY) or near virgin biomass.*
- *4 (Low Concern)—Population may be below target abundance level, but it is considered not overfished.*
- *3 (Moderate Concern) —Abundance level is unknown and the species has a low or medium inherent vulnerability to fishing.*
- *2 (High Concern)—Population is overfished, depleted, or a species of concern, OR abundance is unknown and the species has a high inherent vulnerability to fishing.*
- *1 (Very High Concern)—Population is listed as threatened or endangered.*

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderate Concern

Current evidence suggests that only one stock of bluenose occurs in New Zealand fisheries waters. In 2011, the first fully quantitative stock assessment for the species was carried out (Ministry for Primary Industries 2013a). Modeling showed an ongoing decline in stock biomass trajectories from the 1980s to 2011. The magnitude of the decline varied with the estimate of natural mortality (M) that is used. The assumed target for management is 40% of B_0 (defined as virgin biomass, or the theoretical carrying capacity of the recruited or vulnerable biomass of a fish stock) (Ministry of Fisheries 2008). This is based on the New Zealand Ministry of Fisheries Harvest Strategy Standard, which is intended to provide a policy approach that implements the requirements of New Zealand fisheries law (Ministry of Fisheries 2008). Management targets and limits for harvesting are required, by law, to be sustainable. B_{2011} was

estimated at 15% – 25% B_0 . The stock is considered to be very unlikely ($P < 0.1$) to be at or above this management target. It is considered unlikely ($P < 0.4$) to be below 10% of B_0 but about as likely as not ($P = 0.5$) to be above the soft limit for management (20% of B_0) (Ministry for Primary Industries 2013a). It is therefore unknown whether stock abundance is above the limit reference point. Since it is unknown if the population is above the limit reference point, and bluenose have a medium vulnerability to fishing; a 'moderate concern' score is awarded.

Factor 1.3 - Fishing Mortality

Scoring Guidelines

- *5 (Very Low Concern)—Highly likely that fishing mortality is below a sustainable level (e.g., below fishing mortality at maximum sustainable yield, FMSY), OR fishery does not target species and its contribution to the mortality of species is negligible ($\leq 5\%$ of a sustainable level of fishing mortality).*
- *3.67 (Low Concern)—Probable ($>50\%$) chance that fishing mortality is at or below a sustainable level, but some uncertainty exists, OR fishery does not target species and does not adversely affect species, but its contribution to mortality is not negligible, OR fishing mortality is unknown, but the population is healthy and the species has a low susceptibility to the fishery (low chance of being caught).*
- *2.33 (Moderate Concern)—Fishing mortality is fluctuating around sustainable levels, OR fishing mortality is unknown and species has a moderate-high susceptibility to the fishery and, if species is depleted, reasonable management is in place.*
- *1 (High Concern)—Overfishing is occurring, but management is in place to curtail overfishing, OR fishing mortality is unknown, species is depleted, and no management is in place.*
- *0 (Critical)—Overfishing is known to be occurring and no reasonable management is in place to curtail overfishing.*

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New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderate Concern

Fishing mortality has not been calculated for this species, however, the exploitation rate in the fishery is high in relation to estimated natural mortality. The continuation of past catch amounts is expected to perpetuate the decline in the stock (Ministry for Primary Industries 2012). Therefore, since the 2011 stock assessment, reduced catch limits have been implemented as part of a recovery plan for the bluenose stock (Ministry for Primary Industries 2013a). For example, between the 2011 and 2012 fishing years, the total allowable commercial catch in the quota management areas BNS1 and BNS2 was reduced from 1688 to 1200 tons (Ministry for Primary Industries 2013a).

F is unknown relative to a sustainable level. Catch reductions have been implemented and fishing mortality is considered of 'moderate concern.'

Criterion 2: Impacts on other species

All main retained and bycatch species in the fishery are evaluated in the same way as the species under assessment were evaluated in Criterion 1. Seafood Watch® defines bycatch as all fisheries-related mortality or injury to species other than the retained catch. Examples include discards, endangered or threatened species catch, and ghost fishing.

To determine the final Criterion 2 score, the score for the lowest scoring retained/bycatch species is multiplied by the discard rate score (ranges from 0-1), which evaluates the amount of non-retained catch (discards) and bait use relative to the retained catch. The Criterion 2 rating is determined as follows:

- Score >3.2=Green or Low Concern
- Score >2.2 and <=3.2=Yellow or Moderate Concern
- Score <=2.2=Red or High Concern

Rating is Critical if Factor 2.3 (Fishing Mortality) is Critical.

Criterion 2 Summary

Bluenose: New Zealand: BNS1 Southern Ocean, Longline, Bottom

Subscore: 1.414 Discard Rate: 1.00 C2 Rate: 1.414

| Species | Inherent Vulnerability | Stock Status | Fishing Mortality | Subscore |
|------------------------|------------------------|------------------------|------------------------|--------------|
| ANTIPODEAN ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BULLER'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| PARKINSON'S PETREL | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| SALVIN'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| WHITE-CAPPED ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| GROPER | High | 2.00: High Concern | 2.33: Moderate Concern | 2.159 |
| SPINY DOGFISH | High | 2.00: High Concern | 2.33: Moderate Concern | 2.159 |
| BLUENOSE | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| CAMPBELL ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |

| | | | | |
|---|------|--------------------|------------------------|--------------|
| CORALS AND OTHER BIOGENIC HABITATS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| SOUPFIN SHARK | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WANDERING ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WHITE-CHINNED PETREL | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| BULLER'S SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
| SOOTY SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |

Bluenose: New Zealand: BNS1 Southern Ocean, Trawl, Bottom
Subscore: 1.414
Discard Rate: 1.00
C2 Rate: 1.414

| Species | Inherent Vulnerability | Stock Status | Fishing Mortality | Subscore |
|---|------------------------|------------------------|------------------------|--------------|
| ANTIPODEAN ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BLACK CARDINAL FISH | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BULLER'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| CORALS AND OTHER BIOGENIC HABITATS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| PARKINSON'S PETREL | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| SALVIN'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| WHITE-CAPPED ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BLUENOSE | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| LONGFIN ARMORHEAD | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| RUBYFISH | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| WHITE WAREHOU | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| CAMPBELL ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |

| | | | | |
|--------------------------|------|------------------------|------------------------|--------------|
| WANDERING ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WHITE-CHINNED PETREL | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| ALFONSINO (B. SPLENDENS) | High | 4.00: Low Concern | 2.33: Moderate Concern | 3.053 |
| BULLER'S SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
| SOOTY SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
| HOKI | High | 5.00: Very Low Concern | 5.00: Very Low Concern | 5.000 |

Bluenose: New Zealand: BNS1 Southern Ocean, Trawl, Midwater
Subscore: 1.414
Discard Rate: 1.00
C2 Rate: 1.414

| Species | Inherent Vulnerability | Stock Status | Fishing Mortality | Subscore |
|--------------------------|------------------------|------------------------|------------------------|--------------|
| ANTIPODEAN ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BULLER'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| PARKINSON'S PETREL | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| SALVIN'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| WHITE-CAPPED ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BLUENOSE | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| WHITE WAREHOU | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| CAMPBELL ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WANDERING ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WHITE-CHINNED PETREL | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| ALFONSINO (B. SPLENDENS) | High | 4.00: Low Concern | 2.33: Moderate Concern | 3.053 |
| BULLER'S SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |

| | | | | |
|------------------|------|--------------------|------------------------|--------------|
| SOOTY SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
|------------------|------|--------------------|------------------------|--------------|

Bluenose: New Zealand: BNS2 Southern Ocean, Longline, Bottom

Subscore: 1.414 Discard Rate: 1.00 C2 Rate: 1.414

| Species | Inherent Vulnerability | Stock Status | Fishing Mortality | Subscore |
|------------------------------------|------------------------|------------------------|------------------------|--------------|
| ANTIPODEAN ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BULLER'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| PARKINSON'S PETREL | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| SALVIN'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| WHITE-CAPPED ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| SPINY DOGFISH | High | 2.00: High Concern | 2.33: Moderate Concern | 2.159 |
| BLUENOSE | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| CAMPBELL ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| CORALS AND OTHER BIOGENIC HABITATS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| SOUPFIN SHARK | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WANDERING ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WHITE-CHINNED PETREL | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| BULLER'S SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
| SOOTY SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |

Bluenose: New Zealand: BNS2 Southern Ocean, Trawl, Bottom
Subscore: 1.414
Discard Rate: 1.00
C2 Rate: 1.414

| Species | Inherent Vulnerability | Stock Status | Fishing Mortality | Subscore |
|------------------------------------|------------------------|------------------------|------------------------|--------------|
| ANTIPODEAN ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BLACK CARDINAL FISH | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BULLER'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| CORALS AND OTHER BIOGENIC HABITATS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| PARKINSON'S PETREL | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| SALVIN'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| WHITE-CAPPED ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BLUENOSE | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| CAMPBELL ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WANDERING ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WHITE-CHINNED PETREL | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| BULLER'S SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
| SOOTY SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
| ALFONSINO (B. SPLENDENS) | High | 4.00: Low Concern | 3.67: Low Concern | 3.831 |
| HOKI | High | 5.00: Very Low Concern | 5.00: Very Low Concern | 5.000 |

Bluenose: New Zealand: BNS2 Southern Ocean, Trawl, Midwater
Subscore: 1.414
Discard Rate: 1.00
C2 Rate: 1.414

| Species | Inherent Vulnerability | Stock Status | Fishing Mortality | Subscore |
|----------------------|------------------------|--------------------|--------------------|--------------|
| ANTIPODEAN ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BULLER'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |

| | | | | |
|---------------------------------|--------|------------------------|------------------------|--------------|
| PARKINSON'S PETREL | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| SALVIN'S ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| WHITE-CAPPED ALBATROSS | High | 2.00: High Concern | 1.00: High Concern | 1.414 |
| BLUENOSE | Medium | 3.00: Moderate Concern | 2.33: Moderate Concern | 2.644 |
| CAMPBELL ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WANDERING ALBATROSS | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| WHITE-CHINNED PETREL | High | 2.00: High Concern | 3.67: Low Concern | 2.709 |
| BULLER'S SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
| SOOTY SHEARWATER | High | 2.00: High Concern | 5.00: Very Low Concern | 3.162 |
| ALFONSINO (B. SPLENDENS) | High | 4.00: Low Concern | 3.67: Low Concern | 3.831 |
| HOKI | High | 5.00: Very Low Concern | 5.00: Very Low Concern | 5.000 |

Data on catches of retained and discarded fish, seabirds, marine mammals and marine invertebrates in bluenose fisheries were provided by the Ministry for Primary Industries. Data used were reported from 1 October 2007 – 30 September 2012. Almost all fish species landed from bluenose fishing activity have commercial value and therefore are not discarded. This is due to the large number of species included under the New Zealand Quota Management System. Knowledge of stock status and fishing mortality is variable for retained species. Almost all bycatch species are caught in very low amounts (<1% of the total catch). The exception is southern boarfish in the bottom trawl fishery of BNS1. This fish was the only 'main' bycatch species; its stock status and the sustainability of catch have not been assessed. Seabirds are at risk of capture in trawl and longline fisheries for bluenose, including albatrosses and petrels classified as 'vulnerable' by the IUCN. Some seabirds at risk of capture during bluenose fishing have been identified as potential bycatch (New Zealand-wide) at levels likely in excess of their sustainability limits. Two species of dolphins may be at risk of capture in bluenose trawls, but they are not of conservation concern. Benthic invertebrates, corals, and sponges have also been returned (by government fisheries observers) from bottom fishing gear catching bluenose. Discards for all methods assessed here comprise <10% of catch by weight.

Criterion 2 Assessment

ALFONSINO (B. SPLENDENS)

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Alfonsino live to an average of 19 years and are slow growing. For alfonsino, the FishBase vulnerability score is 57/100 (Froese & Pauly 2012), leading to a Seafood Watch classification of ‘high inherent vulnerability.’

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

Low Concern

Stock above the average stock biomass that results from taking an average catch of maximum sustainable yield (the largest long-term average catch or yield that can be taken from a stock under prevailing ecological and environmental conditions) (Ministry of Fisheries 2008) ($P > 60\%$) based on the assumption that BMSY is 30%–50% of B_0 . The soft limit for harvesting is 20% of B_0 and the hard limit is 10% of B_0 . (Note that at the soft limit the requirement for a rebuilding plan is triggered. Below the hard limit, fishery closure is considered (Ministry of Fisheries 2008). These limits are not aligned with MBA criteria for overfishing). The stock is considered very unlikely ($P < 10\%$) to be below the hard and soft limits, and is unlikely ($P < 40\%$) to decline to a level below the hard limit under current harvesting scenarios (Ministry for Primary Industries 2013a). Given the stock is considered likely to be above BMSY, but this assessment is based on catch per unit effort indices rather than a full stock assessment, the score of ‘low concern’ is assigned.

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Low Concern

A formal stock assessment has not been undertaken for alfonsino in this management area. In the absence of stock assessment information, stable catch landings from 1986 to 2008/09 are the basis of the conclusion that the catch is sustainable short to medium term (Ministry for Primary Industries 2012). The stock is classified as not overfished, but a quantitative stock assessment is lacking. Therefore, a score of 'low concern' is assigned.

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

Moderate Concern

There are no estimates of fishing mortality available (Ministry for Primary Industries 2013a) and therefore this factor is scored as 'moderate concern.'

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Low Concern

Annual landings have remained stable at or above the TACC of 1575 t from 1986 to 2011-12, indicating that current levels of exploitation are sustainable in the short- to medium-term (Ministry for Primary Industries 2013a). A score of 'low concern' is assigned because fishing appears to be sustainable but there is some uncertainty.

Rationale

The long-term sustainable yield using a $F_{0.1}$ strategy has been estimated at 8%–9% B_0 (virgin biomass)(Ministry for Primary Industries 2013a). The total allowable commercial catch is set at 1 575 t, within the range of estimated $F_{0.1}$ yields (1 320 - 1 800 t). Therefore, it is probable that fishing is sustainable but there is significant uncertainty (e.g., in the life history parameters used in models

(Ministry for Primary Industries 2013a).

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4 and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

< 20%

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

< 20%

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

ANTIPODEAN ALBATROSS

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

The IUCN status of this species is 'vulnerable.' In accordance with the Seafood Watch criteria, it is therefore assessed as 'high concern.' Its population trend is considered to be decreasing. It has a limited breeding range, is caught as bycatch in fisheries and is also exposed to land-based threats such as predation and changes in physical ocean conditions (IUCN 2013).

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

Estimated potential fatalities (EPF) in NZ fisheries are at high risk of being beyond the species' sustainability limits, although this risk is not calculated specifically for bluenose fisheries (Richard & Abraham 2013).

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7%–8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data; (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

< 20%

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the

landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom

< 20%

Discards from the longline fishery for bluenose in BNS2 is 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data; (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

< 20%

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

BLACK CARDINAL FISH

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

High

Black cardinal fish are slow growing, late maturing, long-lived species, reaching an average age of 72. The black cardinal fish has a FishBase vulnerability score of 70 (Froese & Pauly 2012) and is

therefore considered to have a high vulnerability.

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

High Concern

There is stock assessment information available for black cardinal fish in quota management areas CDL2, CDL3 and CDL4. This species is assessed as very unlikely ($P < 10\%$) to be at or above the management target of 40% B0, likely ($P > 60\%$) to be below 20% B0 and possibly below ($P \sim 40 - 60\%$) the hard limit of 10% B0. (Note that these management limits are not aligned with Seafood Watch standards for overfishing). Abundance in 2009 was estimated to be at 12% of B0 (for the base case of the stock assessment model, (Ministry for Primary Industries 2012)). Therefore, a score of 'high concern' is assigned.

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

High Concern

The fishery contribution to mortality is unknown. Fishery mortality has not been assessed, but the species is considered likely ($P > 60\%$) to be overfished (Ministry for Primary Industries 2013a). Some management is in place (e.g., reporting requirements) but the efficacy of this is not clear. Therefore, a score of 'high concern' is assigned.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings

(Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

BULLER'S ALBATROSS

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

This species is classified by the IUCN as 'near threatened,' with a population trend most recently assessed as stable. Its main current threat is fisheries bycatch(IUCN 2013). In accordance with Seafood Watch criteria, it is assessed as of 'high concern.'

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

EPF in NZ fisheries are at very high risk of being beyond the species' sustainability limits (Richard & Abraham 2013). Specific assessments of risk are not available in relation to bluenose fisheries. There is management in place, which is believed to be effective at reducing the impact of the fishery on seabirds, therefore Seafood Watch considers this to be a 'high concern' rather than a critical score.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7%–8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data)

(Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4 and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

< 20%

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom

< 20%

Discards from the longline fishery for bluenose in BNS2 is 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

< 20%

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

BULLER'S SHEARWATER

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

Buller's shearwater is classified by the IUCN as 'vulnerable,' with a stable population trend. Threats may include fisheries bycatch and land-based predation, although information is sparse on the current magnitude of these threats (IUCN 2013). In accordance with Seafood Watch criteria, it is assessed as 'high concern.'

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Very Low Concern

EPF in NZ fisheries is at negligible risk of being beyond the species' sustainability limits (Richard & Abraham 2013). A score of 'very low concern' is assigned.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7%–8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

< 20%

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom

< 20%

Discards from the longline fishery for bluenose in BNS2 is 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

< 20%

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

CAMPBELL ALBATROSS

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

The Campbell albatross is classified by the IUCN as ‘vulnerable.’ Its population trend was most recently assessed as increasing. However, threats to its survival include fisheries bycatch, which is hypothesised to be the cause of past population declines shown by this species (IUCN 2013). In accordance with Seafood Watch criteria, it is assessed as being of ‘high concern.’

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Low Concern

EPF in NZ fisheries is at medium risk of being beyond the species' sustainability limits (Richard & Abraham 2013). Richard & Abraham (2103) estimated that fisheries were causing mortality at a level of 10%–30% of the Potential Biological Removal (PBR—a sustainable level of impact). Some effective management is in place (e.g., mitigation measures, catch reporting) in accordance with the New Zealand Fisheries Act 1996 and associated regulations. As a result of the relatively low level of impact and the manamgnt that has been introduced, Seafood Watch considers the impact to be of 'low conservation concern.'

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goat 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included

in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

< 20%

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom

< 20%

Discards from the longline fishery for bluenose in BNS2 is 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

< 20%

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

CORALS AND OTHER BIOGENIC HABITATS

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

High

Corals and other habitat-forming organisms are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

High Concern

In accordance with Seafood Watch criteria, corals and other biogenic habitats were scored using Seafood Watch's 'unknown bycatch matrix' (Seafood Watch 2012). (This matrix was developed from a literature review on benthic fishing impacts together with expert opinion). While government fisheries' observers have detected captures of these species in bottom longline and bottom trawl fishing where fishing for bluenose occurs, the identification, any assessment of status, and the extent of habitats occupied by these organisms are all poorly known. Therefore, more specific (e.g., taxon by taxon) assessments were not possible.

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

Low Concern

The fishing mortality was determined using the Seafood Watch 'unknown bycatch matrix.' The potential risk to corals and biogenic habitats from bottom longlines is considered a low conservation concern (Seafood Watch 2012).

New Zealand: BNS1 Southern Ocean, Trawl, Bottom**High Concern**

Fishing mortality concerns were scored according to the Seafood Watch 'unknown bycatch' criteria, which considers the potential impact to corals and biogenic habitats from bottom trawls as a high conservation concern (Seafood Watch 2012). In New Zealand waters, there are management measures intended to reduce the impacts of bottom trawling on benthic fauna in some areas. For example, seamount closures and benthic protected areas exclude bottom trawling (Ministry for Primary Industries 2012).

New Zealand: BNS2 Southern Ocean, Longline, Bottom**Low Concern**

The fishing mortality was determined using the Seafood Watch 'unknown bycatch matrix.' The potential risk to corals and biogenic habitats from bottom longlines is considered a low conservation concern (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom**High Concern**

Fishing mortality concerns were scored according to the Seafood Watch 'unknown bycatch' criteria, which considers the potential impact to corals and biogenic habitats from bottom trawls as a high conservation concern (Seafood Watch 2012). In New Zealand waters, there are management measures intended to reduce the impacts of bottom trawling on benthic fauna in some areas. For example, seamount closures and benthic protected areas exclude bottom trawling (Ministry for Primary Industries 2012).

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS2 Southern Ocean, Longline, Bottom

< 20%

Discards from the longline fishery for bluenose in BNS2 is 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

GROPER**Factor 2.1 - Inherent Vulnerability**

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

High

Groper reach a relatively large size, over 200 cm, are relatively long lived (36 years) and mature at a moderate age (7-8 years). The FishBase score for this species reflects high vulnerability (76/100).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

High Concern

No estimates of current or reference biomass are available. A stock assessment has not been completed (Ministry for Primary Industries 2013a). The IUCN classifies this species as 'data deficient.' As abundance is unknown and vulnerability is high, Seafood Watch criteria lead to a scoring of 'high concern.'

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

Moderate Concern

Fishery contribution is unknown and fishing mortality has not been assessed (Ministry for Primary Industries 2013a). A stock assessment has not been completed for this species. Given these knowledge gaps, a score of 'moderate concern' is assigned in accordance with the Seafood Watch criteria.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

HOKI**Factor 2.1 - Inherent Vulnerability**

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Hoki, or blue grenadier, are a slow growing species that inhabits relatively deep sea habitats. They have a moderately long life expectancy at 20-25 years. The FishBase vulnerability score is 66, therefore, Seafood Watch considers vulnerability to be 'high.'

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Very Low Concern

A full quantitative stock assessment has been completed. The stock is assessed as virtually certain ($P > 99\%$) to be at or above the lower limit of the management target of 35%–50% B_0 , and exceptionally unlikely ($P < 1\%$) to be below the hard and soft limits. $B(2011)$ is estimated at 53% B_0 (Ministry for Primary Industries 2012).

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Very Low Concern

Fishing intensity is estimated to have decreased continuously since 2004, coinciding with an ongoing increase in spawning stock biomass. Model runs show fishing intensity is consistently below that required to maintain a spawning biomass of 50%B0. Overfishing is considered to be very unlikely to be occurring (P<10%) (Ministry for Primary Industries 2013a).

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

< 20%

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

LONGFIN ARMORHEAD

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

Medium

Longfin, or pelagic, armorhead live for an average of 10 years, mature after 2-3 years and have a moderate growth rate. The FishBase vulnerability score is 44 out of 100 (Froese & Pauly 2012), resulting in a Seafood Watch score of 'medium' vulnerability.

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

Moderate Concern

The stock of this species has not been formally assessed. As a result, there is no evidence that it is above or below reference points. The species' inherent vulnerability is classified as 'moderate,' leading to an assessment of 'moderate concern,' in accordance with the Seafood Watch criteria.

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

Moderate Concern

Fishery contribution is unknown. Fishing mortality (and stock status) have not been assessed for this species. Species-specific management measures are not in place.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

PARKINSON'S PETREL

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

This species has been classified by the IUCN as 'vulnerable.' Threats to the species include fisheries bycatch and mammalian predators, which occur around some breeding areas (IUCN 2013). In accordance with Seafood Watch criteria, it is assessed as being of 'high concern.'

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

EPF across NZ fisheries (i.e., total cumulative fatalities) is >95% likely to be beyond the species' sustainability limits. Some management is in place to reduce fishing impacts (Richard & Abraham 2013). The specific contribution of bluenose fisheries to EPF has not been assessed. In accordance with the Seafood Watch criteria, a score of 'high concern' is assigned.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goat 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom**< 20%**

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater**< 20%**

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom**< 20%**

Discards from the longline fishery for bluenose in BNS2 is 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom**< 20%**

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater**< 20%**

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

RUBYFISH

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

Medium

Rubyfish have a life expectancy of 10 years, mature at 2-3 years and have a moderate growth rate. For rubyfish, the FishBase vulnerability score is 41 out of 100 (Froese & Pauly 2012), leading to a Seafood Watch classification of 'medium' inherent vulnerability.

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

Moderate Concern

There has been no stock assessment conducted for rubyfish. There is no evidence that the stock is above or below reference points. The inherent resilience (factor 1.1) is 'medium.' Therefore, a score of 'moderate concern' results.

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

Moderate Concern

Total fishing mortality and the contribution of this fishery are unknown (Ministry for Primary Industries 2013a). This species has not been evaluated in a stock assessment. Therefore, a score of 'moderate concern' results, in accordance with Seafood Watch criteria.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

SALVIN'S ALBATROSS

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

The IUCN classification of this species is 'vulnerable.' It is restricted to two breeding sites and its population trend is unknown. The species' main breeding site is extremely exposed to harsh oceanic weather conditions, which have caused breeding failure in past years. The population trajectory is unknown. Fisheries bycatch is an ongoing at-sea threat (IUCN 2013).

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

EPF across NZ fisheries (i.e., total cumulative fatalities) is >95% likely to be beyond the species' sustainability limits. The specific contribution of bluenose fishing activity to this risk has not been assessed. However, some management is in place to reduce fishing impacts (Richard & Abraham 2013). In accordance with the Seafood Watch criteria, a score of 'high concern' is assigned.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goat 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom**< 20%**

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater**< 20%**

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom**< 20%**

Discards from the longline fishery for bluenose in BNS2 are 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom**< 20%**

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater**< 20%**

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

SOOTY SHEARWATER**Factor 2.1 - Inherent Vulnerability**

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

The IUCN status of this species is 'near threatened,' which accords with the Seafood Watch classification of 'high concern.' The species population is declining. Threats to this species include fisheries bycatch, human harvest of pre-fledge young, and predation at the nesting grounds (IUCN 2013).

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Very Low Concern

EPF in NZ fisheries is at negligible risk of being beyond the species' sustainability limits (Richard & Abraham 2013). Therefore, a score of 'very low concern' is assigned.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater**< 20%**

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom**< 20%**

Discards from the longline fishery for bluenose in BNS2 are 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom**< 20%**

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater**< 20%**

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

SOUPFIN SHARK**Factor 2.1 - Inherent Vulnerability**

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Longline, Bottom

High

Soupsin shark, or tope, have a relatively long life expectancy (24 years), low growth rate and low fecundity. FishBase allocates this species a vulnerability score of 73 out of 100 (Froese & Pauly 2012), leading to a Seafood Watch classification of 'high' inherent vulnerability.

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Longline, Bottom

High Concern

The IUCN has classified this species as 'vulnerable.' However, it does not currently appear threatened in NZ waters. A single stock is thought to occupy NZ waters; standardized CPUE indices show a flat or slightly increasing trend in abundance through a 20 year period in QMA1, and a net increase above the long-term average in QMA2 in the same period. The status in relation to the hard and soft limits is unknown. However, in QMA1 and QMA2, the species is considered likely ($P > 60\%$) to remain near current levels of abundance under current catches (Ministry for Primary Industries 2012).

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Longline, Bottom

Low Concern

Overfishing is considered unlikely to be occurring (Ministry for Primary Industries 2013a). While fishing mortality has not been assessed quantitatively, stable or increasing standardized CPUE indices provide a basis for the conclusion that (in QMA1 and QMA2) the species is considered likely ($P > 60\%$) to remain near current levels of abundance provided catch does not increase (Ministry for Primary Industries 2012). Therefore, a score of 'low concern' is assigned.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom**< 20%**

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS2 Southern Ocean, Longline, Bottom**< 20%**

Discards from the longline fishery for bluenose in BNS2 are 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data; (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

SPINY DOGFISH**Factor 2.1 - Inherent Vulnerability**

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom**New Zealand: BNS2 Southern Ocean, Longline, Bottom****High**

Spiny dogfish are slow growing and reach a relatively old age of 41 years. For spiny dogfish, the FishBase vulnerability score is 69 out of 100 (Froese & Pauly 2012), leading to a Seafood Watch classification of 'high' inherent vulnerability.

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Longline, Bottom**High Concern**

Spiny dogfish is listed by the IUCN as 'vulnerable' (IUCN 2013). Estimates of current or sustainable levels of abundance are not available as a stock assessment has not been completed. (Ministry for Primary Industries 2013a). The IUCN classification of this species (and lack of other, population-specific, information) leads to a score of 'high concern' in accordance with the Seafood Watch criteria.

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom**New Zealand: BNS2 Southern Ocean, Longline, Bottom****Moderate Concern**

The fishery contribution to mortality is unknown and fishing mortality has not been reported (Ministry for Primary Industries 2013a). Management is in place, in the form of annual catch limits for this species (Ministry for Primary Industries 2013a). Therefore, a score of 'moderate concern' is assigned.

Factor 2.4 - Discard Rate**New Zealand: BNS1 Southern Ocean, Longline, Bottom****< 20%**

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS2 Southern Ocean, Longline, Bottom**< 20%**

Discards from the longline fishery for bluenose in BNS2 are 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)).

Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

WANDERING ALBATROSS

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

This species has been classified as 'vulnerable' by the IUCN, with a decreasing population trend (IUCN 2013). Key threats to the survival of this species include habitat degradation in some areas as well as

fisheries (IUCN 2013).

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Low Concern

Captures in assessed fisheries are expected to be very low and of limited population-level impact given this species is uncommon in NZ waters (Ramm 2010, Ramm 2011, Rowe 2008). The impact of the bluenose fishery is considered a 'low' conservation concern.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included

in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

< 20%

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom

< 20%

Discards from the longline fishery for bluenose in BNS2 are 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

< 20%

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

WHITE WAREHOU

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

Medium

White warehou reach an average age of 12 years, mature at 2-3 years of age and have a moderate growth rate. For white warehou, the FishBase vulnerability score is 45 out of 100 (Froese & Pauly 2012), resulting in a Seafood Watch score of 'medium vulnerability.'

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

Moderate Concern

No information is available with which to assess stock status in New Zealand waters (Ministry for Primary Industries 2012). However, it has been assessed by the IUCN as being of 'least concern' (IUCN 2013). The species' inherent vulnerability is considered to be Moderate (Froese & Pauly 2012). Since the status of this species has not been formally assessed in NZ waters, and the species has a medium vulnerability to fishing, a score of 'moderate concern' is assigned.

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

Moderate Concern

The fishery contribution to the mortality of this species is unknown, fishing mortality has not been assessed and the sustainability of harvest is unknown (Ministry for Primary Industries 2013a).

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Trawl, Bottom**< 20%**

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater**< 20%**

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

WHITE-CAPPED ALBATROSS**Factor 2.1 - Inherent Vulnerability**

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom**New Zealand: BNS1 Southern Ocean, Trawl, Bottom****New Zealand: BNS1 Southern Ocean, Trawl, Midwater****New Zealand: BNS2 Southern Ocean, Longline, Bottom****New Zealand: BNS2 Southern Ocean, Trawl, Bottom****New Zealand: BNS2 Southern Ocean, Trawl, Midwater****High**

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

This species is classified by the IUCN as 'near threatened.' Its population is reported to be decreasing. The greatest threat to the species' survival is fishery bycatch. This albatross has a wide range and overlaps in at-sea distribution with many trawl and longline fleets in the southern hemisphere (IUCN 2013).

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

EPF in NZ fisheries at very high risk of being beyond the species' sustainability limits (Richard & Abraham 2013) although the specific contribution of bluenose fishing activity to this risk has not been assessed. Management measures are in place that are believed to reduce the impact of the fishery on seabird populations. In accordance with the Seafood Watch criteria, a score of 'high concern' is assigned.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

< 20%

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom

< 20%

Discards from the longline fishery for bluenose in BNS2 are 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

< 20%

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

WHITE-CHINNED PETREL

Factor 2.1 - Inherent Vulnerability

Scoring Guidelines (same as Factor 1.1 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High

Seabirds are considered to have a high vulnerability to fishing activities (Seafood Watch 2012).

Factor 2.2 - Stock Status

Scoring Guidelines (same as Factor 1.2 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

High Concern

This species has been classified by the IUCN as ‘vulnerable.’ It is caught in longline and trawl fisheries in a variety of southern hemisphere fisheries. Its population trend is considered to be decreasing (IUCN 2013).

Factor 2.3 - Fishing Mortality

Scoring Guidelines (same as Factor 1.3 above)

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Low Concern

EPF in NZ fisheries at medium risk of being beyond the species' sustainability limits (Richard & Abraham 2013) although the specific contribution of bluenose fisheries to this risk has not been assessed. Richard & Abraham (2103) estimated that fisheries were causing mortality at a level of 10%–30% of the potential biological removal (PBR – a sustainable level of impact). Management is required and in place, and includes the use of mitigation measures and the reporting of captures. Therefore, in accordance with the Seafood Watch criteria, a score of ‘low concern’ is assigned.

Factor 2.4 - Discard Rate

New Zealand: BNS1 Southern Ocean, Longline, Bottom

< 20%

Longline discards in BNS1 range from between 7.7% and 8.4% of the total landings of all species (Ministry for Primary Industries, unpublished data). The volume of bait used in this fishery is unknown, but it is not considered substantial in proportion to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with the Seafood Watch criteria (Seafood Watch 2012), this factor is not considered further.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

< 20%

Discards from bottom trawls targeting bluenose in BNS1 are between 1.4% and 3.6% of the landings (Ministry for Primary Industries, unpublished data). This is due largely to the number of species included in the New Zealand Quota Management System. (Species included in this management system are assigned a commercial value, and must be retained in almost all circumstances).

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

< 20%

Discards from the bluenose midwater trawl fishery in BNS1 are in the range of 0.07%–0.9% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Longline, Bottom

< 20%

Discards from the longline fishery for bluenose in BNS2 are 0.7% of the landings (Ministry for Primary Industries, unpublished data). The volume of bait used is unknown in this fishery, but is not considered significant relative to landings (Ministry for Primary Industries, unpublished data (Goad 2010)). Therefore, in accordance with Seafood Watch guidance, it is not considered further (Seafood Watch 2012).

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

< 20%

Discards from the bottom trawl fishery for bluenose in BNS2 account for 1.2%–4.8% of the landings (Ministry for Primary Industries, unpublished data).

New Zealand: BNS2 Southern Ocean, Trawl, Midwater**< 20%**

Discards from the midwater trawl fishery for bluenose in BNS2 account for 0.2%–0.5% of the landings (Ministry for Primary Industries, unpublished data).

Criterion 3: Management effectiveness

Management is separated into management of retained species (harvest strategy) and management of non-retained species (bycatch strategy).

The final score for this criterion is the geometric mean of the two scores. The Criterion 3 rating is determined as follows:

- *Score >3.2=Green or Low Concern*
- *Score >2.2 and <=3.2=Yellow or Moderate Concern*
- *Score <=2.2 or either the Harvest Strategy (Factor 3.1) or Bycatch Management Strategy (Factor 3.2) is Very High Concern = Red or High Concern*

Rating is Critical if either or both of Harvest Strategy (Factor 3.1) and Bycatch Management Strategy (Factor 3.2) ratings are Critical.

Criterion 3 Summary

| Region / Method | Management of Retained Species | Management of Non-Retained Species | Overall Recommendation |
|---|---------------------------------------|---|-------------------------------|
| New Zealand: BNS1 Southern Ocean Longline, Bottom | 3.000 | 3.000 | Yellow(3.000) |
| New Zealand: BNS1 Southern Ocean Trawl, Bottom | 3.000 | 3.000 | Yellow(3.000) |
| New Zealand: BNS1 Southern Ocean Trawl, Midwater | 3.000 | 3.000 | Yellow(3.000) |
| New Zealand: BNS2 Southern Ocean Longline, Bottom | 3.000 | 3.000 | Yellow(3.000) |
| New Zealand: BNS2 Southern Ocean Trawl, Bottom | 3.000 | 3.000 | Yellow(3.000) |
| New Zealand: BNS2 Southern Ocean Trawl, Midwater | 3.000 | 3.000 | Yellow(3.000) |

Factor 3.1: Harvest Strategy

Scoring Guidelines

Seven subfactors are evaluated: Management Strategy, Recovery of Species of Concern, Scientific Research/Monitoring, Following of Scientific Advice, Enforcement of Regulations,

Management Track Record, and Inclusion of Stakeholders. Each is rated as ‘ineffective,’ ‘moderately effective,’ or ‘highly effective.’

- 5 (Very Low Concern)—Rated as ‘highly effective’ for all seven subfactors considered.
- 4 (Low Concern)—Management Strategy and Recovery of Species of Concern rated ‘highly effective’ and all other subfactors rated at least ‘moderately effective.’
- 3 (Moderate Concern)—All subfactors rated at least ‘moderately effective.’
- 2 (High Concern)—At minimum, meets standards for ‘moderately effective’ for Management Strategy and Recovery of Species of Concern, but at least one other subfactor rated ‘ineffective.’
- 1 (Very High Concern)—Management exists, but Management Strategy and/or Recovery of Species of Concern rated ‘ineffective.’
- 0 (Critical)—No management exists when there is a clear need for management (i.e., fishery catches threatened, endangered, or high concern species), OR there is a high level of illegal, unregulated, and unreported fishing occurring.

Factor 3.1 Summary

| Factor 3.1: Management of fishing impacts on retained species | | | | | | | |
|---|-------------------------|----------|-------------------------|---------------------|-------------------------|-------------------------|---------------------|
| Region / Method | Strategy | Recovery | Research | Advice | Enforce | Track | Inclusion |
| New Zealand: BNS1 Southern Ocean Longline, Bottom | Moderately Effective | N/A | Moderately Effective | Highly Effective | Moderately Effective | Moderately Effective | Highly Effective |
| New Zealand: BNS1 Southern Ocean Trawl, Bottom | Moderately Effective | N/A | Moderately Effective | Highly Effective | Moderately Effective | Moderately Effective | Highly Effective |
| New Zealand: BNS1 Southern Ocean Trawl, Midwater | Moderately Effective | N/A | Moderately Effective | Highly Effective | Moderately Effective | Moderately Effective | Highly Effective |
| New Zealand: BNS2 Southern Ocean Longline, Bottom | Moderately Effective | N/A | Moderately Effective | Highly Effective | Moderately Effective | Moderately Effective | Highly Effective |
| New Zealand: BNS2 Southern Ocean Trawl, Bottom | Moderately Effective | N/A | Moderately Effective | Highly Effective | Moderately Effective | Moderately Effective | Highly Effective |
| New Zealand: BNS2 Southern Ocean Trawl, Midwater | Moderately Effective | N/A | Moderately Effective | Highly Effective | Moderately Effective | Moderately Effective | Highly Effective |

Management approaches to retained catch are species- and area-based (on Quota Management Area), rather than gear-based. Therefore, this factor can be evaluated as the same across all fishing methods assessed. Comprehensive stock assessments are available for

some retained species (see Criterion 2.1), but for most species, management is based on less developed (though still somewhat quantitative) evaluations (e.g., catch per unit effort over time). These evaluations utilize observer and fisher-reported data on catch weight and composition (Ministry for Primary Industries 2013a). Levels of monitoring by government fisheries' observers is highly variable (e.g., <5% - >20% observer coverage), depending on vessel size and flag state, target species, and area in which fishing occurs (Rowe, S. 2008; Ramm, K. 2010, 2011; Abraham, E. and Thompson, F. 2011). This renders the assessment of the long-term efficacy of management approaches not possible for most retained species in bluenose fisheries specifically. However, management has responded to declines evident in bluenose stocks by reducing catch limits. The incorporation of scientific advice into management is transparent and management decision-making includes multiple opportunities for stakeholder involvement.

Subfactor 3.1.1 – Management Strategy and Implementation

Considerations: What type of management measures are in place? Are there appropriate management goals, and is there evidence that management goals are being met? To achieve a 'highly effective' rating, there must be appropriate management goals, and evidence that the measures in place have been successful at maintaining/rebuilding species.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderately Effective

Legislative approaches to fishery management are relatively strong, in terms of fishery sustainability. The New Zealand Fisheries Act has specific requirements relating to ensuring the sustainability of fisheries. This encompasses species caught that have commercial value, as well as the impacts of fishing activity on the marine environment more broadly. Catch limits on species with commercial value are implemented through the Quota Management System, which is based on landed catch in delineated geographic areas, regardless of gear types used. Financial penalties are used as disincentives for overcatch. Catch limits have been implemented successfully in BNS1 and BNS2. For other retained species, there is a range of evidence that management is meeting its goals (e.g., for hoki *Macrurus novaezealandiae*) or that harvesting impacts are unknown (e.g., white warehou *Seriolella*

caerulea)(Ministry for Primary Industries 2013a). A score of ‘moderately effective’ is assigned, given the strong management framework in place, which is applied with variable levels of efficacy across the suite of species affected by fishery activity.

Subfactor 3.1.2 – Recovery of Species of Concern

Considerations: When needed, are recovery strategies/management measures in place to rebuild overfished/threatened/ endangered species or to limit fishery’s impact on these species and what is their likelihood of success? To achieve a rating of ‘highly effective,’ rebuilding strategies that have a high likelihood of success in an appropriate timeframe must be in place when needed, as well as measures to minimize mortality for any overfished/threatened/endangered species.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

N/A

In accordance with the Seafood Watch criteria, this subfactor is not scored, as bluenose stocks are not assessed as overfished, depleted, endangered or threatened.

Subfactor 3.1.3 – Scientific Research and Monitoring

Considerations: How much and what types of data are collected to evaluate the health of the population and the fishery’s impact on the species? To achieve a ‘highly effective’ rating, population assessments must be conducted regularly and they must be robust enough to reliably determine the population status.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderately Effective

Up-to-date and rigorous stock assessments are available for bluenose and hoki, but quantitative approaches to stock management are more limited for other retained species. The nature and extent of data collection on retained species' stocks is also variable and tends to be prioritized based on the commercial importance of catch, or sustainability issues (Ministry of Fisheries 2010). Government fisheries observers collect comprehensive information on catch (both target and non-target) and fishing effort where observers are deployed. However, observer deployments in bluenose fisheries are variable. (For example, observers have been placed on vessels conducting 0%–2.4% of fishing effort annually, from 2002/03 – 2010/11, see: <http://data.dragonfly.co.nz/psc/v20121101/birds/bluenose-longline/all-vessels/eez/all/>). The extent of data collection, and utilization for management, supports a score of 'moderately effective' in accordance with the Seafood Watch criteria.

Subfactor 3.1.4 – Management Record of Following Scientific Advice

Considerations: How often (always, sometimes, rarely) do managers of the fishery follow scientific recommendations/advice (e.g., do they set catch limits at recommended levels)? A 'highly effective' rating is given if managers nearly always follow scientific advice.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Highly Effective

Management action is closely linked to scientific advice (Ministry for Primary Industries 2013a). For example, management has responded to science evidence showing decreases in the abundance of the stock over time by reducing bluenose catch limits. However, the lack of science available with which to develop management approaches constrains management efficacy in some areas (e.g., knowledge of the stock and population structure). The utilization of scientific advice in the management of bluenose

fisheries leads to a score of 'highly effective.'

Subfactor 3.1.5 – Enforcement of Management Regulations

Considerations: Do fishermen comply with regulations, and how is this monitored? To achieve a 'highly effective' rating, there must be regular enforcement of regulations and verification of compliance.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderately Effective

Observer coverage of bluenose fishing is highly variable, as a consequence of the diversity of vessels catching this species and the use of both trawl and longline methods. Inshore longline and trawl fisheries involving smaller vessels (<28 m in length) are monitored by observers at very low rates (e.g., <5% of fishing effort), which limits understanding of fishery activities and impacts, and enforcement. Observer coverage of offshore fisheries using larger vessels is more extensive, and can reach 20% or more (Rowe 2008, Ramm 2010, Ramm 2011, Abraham & Thompson 2011)). Where observers are present, they collect information on catch composition and many other aspects of fishing operations. While not enforcers themselves, observers provide information with which enforcement action is taken. In addition to catch documentation reported by observers, fishers are required to report some catch information (New Zealand Government 2001). While not investigated for tows targeting bluenose, comparisons between fisher-reported catch data and observer data made in other trawl fisheries highlight past issues with fisher under-reporting (Bremner et al. 2009; Anderson, O.F. 2009). A score of 'moderately effective' is assigned.

Subfactor 3.1.6 – Management Track Record

Considerations: Does management have a history of successfully maintaining populations at sustainable levels or a history of failing to maintain populations at sustainable levels? A 'highly

effective' rating is given if measures enacted by management have been shown to result in the long-term maintenance of species overtime.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderately Effective

For bluenose, management processes have included the reduction of catch limits in response to sustainability issues in the stock (Ministry for Primary Industries 2013a). Reduced catch limits have not yet been in place for a period sufficient for assessing their efficacy. Retained species caught with bluenose include those for which significant bodies of information occur (e.g., hoki), and those for which the sustainability of current harvesting is unknown (e.g., white warehou). For well-known stocks (e.g., hoki), management processes have included responses to stock depletion such as reductions in allowable catch. However, given the uncertainty of management measures for some species with respect to the maintenance of stock abundance long-term, a score of 'moderately effective' is assigned.

Subfactor 3.1.7 – Stakeholder Inclusion

Considerations: Are stakeholders involved/included in the decision-making process?

Stakeholders are individuals/groups/organizations that have an interest in the fishery or that may be affected by the management of the fishery (e.g., fishermen, conservation groups, etc.).

A 'highly effective' rating is given if the management process is transparent and includes stakeholder input.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Highly Effective

All stakeholders can access working groups, scientific information, and policy documents with which management advice is developed for retained species caught in these fisheries. Stakeholders are able to attend and participate fully in all working group meetings. Documents are circulated online and available in hard copy, proceedings of meetings are documented and circulated to all stakeholders. Management decisions made by the Minister for Primary Industries (who is responsible for fisheries) are documented and made available online.

Bycatch Strategy

| Factor 3.2: Management of fishing impacts on bycatch species | | | | | | |
|--|----------|----------|----------------------|----------------------|------------------|----------------------|
| Region / Method | All Kept | Critical | Strategy | Research | Advice | Enforce |
| New Zealand: BNS1 Southern Ocean Longline, Bottom | No | No | Moderately Effective | Moderately Effective | Highly Effective | Moderately Effective |
| New Zealand: BNS1 Southern Ocean Trawl, Bottom | No | No | Moderately Effective | Moderately Effective | Highly Effective | Moderately Effective |
| New Zealand: BNS1 Southern Ocean Trawl, Midwater | No | No | Moderately Effective | Moderately Effective | Highly Effective | Moderately Effective |
| New Zealand: BNS2 Southern Ocean Longline, Bottom | No | No | Moderately Effective | Moderately Effective | Highly Effective | Moderately Effective |
| New Zealand: BNS2 Southern Ocean Trawl, Bottom | No | No | Moderately Effective | Moderately Effective | Highly Effective | Moderately Effective |
| New Zealand: BNS2 Southern Ocean Trawl, Midwater | No | No | Moderately Effective | Moderately Effective | Highly Effective | Moderately Effective |

As for retained species, management approaches to bycatch (excluding seabirds) do not differ for trawl and longline fisheries. Among the fisheries assessed here, there is only one 'main' fish bycatch species—the southern boarfish (*Pseudopentaceros richardsoni*)—caught in BNS1 during bottom trawl fishing. There are differences in the legal requirements for seabird bycatch reduction measures based on fishing method. However, the objective of such measures is identical between fisheries. Consequently, scores for all fisheries are identical in this section. Stock or population assessments are unavailable for the southern boarfish, marine mammals and benthic invertebrate bycatch. Seabirds are an exception, for which population levels are

broadly known and risk of commercial fisheries to populations has been explicitly examined (Richard, Y. and Abraham, E. 2013). Data collection by observers is robust where it occurs although levels vary significantly in different areas and for different sectors of the fishery harvesting bluenose (e.g., smaller vessels fishing inshore versus larger vessel fishing offshore: <5% – >20% observer coverage, Rowe, S. 2008; Ramm, K. 2010, 2011; Abraham, E. and Thompson, F. 2011). With the variation in coverage levels across sectors of the fleet harvesting bluenose and lack of alternative data collection regimes for most bycatch species in areas fished, development of science-based advice for management is difficult. Enforcement capabilities are similarly constrained in the absence of observer coverage (e.g., on smaller inshore trawlers catching bluenose). Enforcement is undertaken on a case by case basis, when deemed appropriate by government agencies.

Subfactor 3.2.1 – Management Strategy and Implementation

Considerations: What type of management strategy/measures are in place to reduce the impacts of the fishery on bycatch species and how successful are these management measures? To achieve a ‘highly effective’ rating, the primary bycatch species must be known and there must be clear goals and measures in place to minimize the impacts on bycatch species (e.g., catch limits, use of proven mitigation measures, etc.).

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderately Effective

Legislative approaches to fishery management are relatively strong, in that sustainability is an explicit consideration and includes the broader marine ecosystem (i.e., all bycatch species as well as target and retained species). There are no limits on volumes of bycatch taken of any species. However, quantities of bycatch taken are monitored through observer coverage where this occurs, and the legal requirement for fishers to report protected species and fish catch (see below). Seabird bycatch is managed more closely than fish bycatch, with the development of a risk assessment (Richard & Abraham 2013), and management responses implemented across fisheries based on vessel size and fishing method (e.g., mandatory deployment of devices intended to reduce seabird bycatch on larger

trawlers and bottom longliners (New Zealand Government 2010a)(New Zealand Government 2010b)). For fish bycatch species, no measures are in place for bluenose fisheries specifically. A score of 'moderately effective' is assigned, in accordance with Seafood Watch criteria.

Subfactor 3.2.2 – Scientific Research and Monitoring

Considerations: Is bycatch in the fishery recorded/documented and is there adequate monitoring of bycatch to measure fishery's impact on bycatch species? To achieve a 'highly effective' rating, assessments must be conducted to determine the impact of the fishery on species of concern, and an adequate bycatch data collection program must be in place to ensure bycatch management goals are being met.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderately Effective

Bycatch is monitored by fisheries observers where coverage occurs. This can be highly variable, and tends to be minimal on smaller vessels (see Enforcement, below). Fishers also report some bycatch information (e.g., the top eight species caught, by weight). Low levels and lack of representativeness in observer coverage applying to bluenose fishing activity specifically renders generation of bycatch estimates difficult. However, estimates are available for seabird captures in bluenose fisheries, as well as for some protected species caught in fisheries alongside which bluenose is caught (e.g., hoki (Abraham & Thompson 2011)). Thus, some data collection occurs, albeit non-representative across the fishery. Some analysis is performed, but available data do not allow robust quantitative investigation of outcome statuses for all bycatch species.

Subfactor 3.2.3 – Management Record of Following Scientific Advice

Considerations: How often (always, sometimes, rarely) do managers of the fishery follow scientific recommendations/advice (e.g., do they set catch limits at recommended levels)? A Highly Effective rating is given if managers nearly always follow scientific advice.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Highly Effective

For some bycatch species (e.g., seabirds), management action is closely linked to scientific advice (Ministry for Primary Industries 2013b). For other species (e.g., corals, benthic invertebrates), lack of scientific information available with which to develop management approaches constrains management efficacy in some areas.

Subfactor 3.2.4 – Enforcement of Management Regulations

Considerations: Is there a monitoring/enforcement system in place to ensure fishermen follow management regulations and what is the level of fishermen's compliance with regulations? To achieve a 'highly effective' rating, there must be consistent enforcement of regulations and verification of compliance.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Moderately Effective

Fishers are legally required to report non-fish bycatch (Ministry of Fisheries 2011) and fish bycatch when bycatch species are among the eight species caught in the highest amounts (New Zealand Government 2001). Government fisheries observers collect a significant body of information that is available to enforcement agencies, and acted on case by case, as deemed appropriate. The compliance model is an "inform and assist" one, such that possibly unintentional compliance breaches are followed up with an

educational approach, and further action is taken as deemed necessary over time. Government agencies monitor compliance, as well as industry to some degree for trawl fisheries. Given the measures in place, a score of 'moderately effective' is assigned.

Criterion 4: Impacts on the habitat and ecosystem

This Criterion assesses the impact of the fishery on seafloor habitats, and increases that base score if there are measures in place to mitigate any impacts. The fishery's overall impact on the ecosystem and food web and the use of ecosystem-based fisheries management (EBFM) principles is also evaluated. Ecosystem Based Fisheries Management aims to consider the interconnections among species and all natural and human stressors on the environment.

The final score is the geometric mean of the impact of fishing gear on habitat score (plus the mitigation of gear impacts score) and the Ecosystem Based Fishery Management score. The Criterion 2 rating is determined as follows:

- Score >3.2=Green or Low Concern
- Score >2.2 and <=3.2=Yellow or Moderate Concern
- Score <=2.2=Red or High Concern

Rating cannot be Critical for Criterion 4.

Criterion 4 Summary

| Region / Method | Gear Type and Substrate | Mitigation of Gear Impacts | EBFM | Overall Recomm. |
|--|--------------------------------|-----------------------------------|------------------|------------------------|
| New Zealand: BNS1 Southern Ocean Longline, Bottom | 2.00:Moderate Concern | 0.00:No Effective Mitigation | 4.00:Low Concern | Yellow (2.828) |
| New Zealand: BNS1 Southern Ocean Trawl, Bottom | 0.00:Very High Concern | 0.25:Minimal Mitigation | 4.00:Low Concern | Red (1.000) |
| New Zealand: BNS1 Southern Ocean Trawl, Midwater | 5.00:None | 0.00:Not Applicable | 4.00:Low Concern | Green (4.472) |
| New Zealand: BNS2 Southern Ocean Longline, Bottom | 2.00:Moderate Concern | 0.00:No Effective Mitigation | 4.00:Low Concern | Yellow (2.828) |
| New Zealand: BNS2 Southern Ocean Trawl, Bottom | 0.00:Very High Concern | 0.25:Minimal Mitigation | 4.00:Low Concern | Red (1.000) |
| New Zealand: BNS2 Southern Ocean Trawl, Midwater | 5.00:None | 0.00:Not Applicable | 4.00:Low Concern | Green (4.472) |

Bottom trawling and longlining for bluenose occurs on habitats including those supporting communities of habitat-creating organisms (e.g., corals). The amount of fishing is managed through catch limits although there are no effort restrictions (e.g., on numbers or durations of longline hooks/sets or trawl tows) in place. Some benthic protection occurs at a nationwide

scale, through the exclusion of bottom trawling from designated areas. These areas include parts of the bluenose quota management areas (QMAs) assessed here, but are not representative of habitat types within those QMAs. Considering ecosystem effects is a specific component of the management approach. Work has not been focused on bluenose fishing per se. However, some ecosystem components are managed across New Zealand fisheries e.g., seabirds, for which bycatch reduction measures are required on all trawlers ≥ 28 m and bottom longliners.

Justification of Ranking

Factor 4.1 – Impact of Fishing Gear on the Habitat/Substrate

Scoring Guidelines

- *5 (None)—Fishing gear does not contact the bottom*
- *4 (Very Low)—Vertical line gear*
- *3 (Low)—Gears that contacts the bottom, but is not dragged along the bottom (e.g. gillnet, bottom longline, trap) and is not fished on sensitive habitats. Bottom seine on resilient mud/sand habitats. Midwater trawl that is known to contact bottom occasionally)*
- *2 (Moderate)—Bottom dragging gears (dredge, trawl) fished on resilient mud/sand habitats. Gillnet, trap, or bottom longline fished on sensitive boulder or coral reef habitat. Bottom seine except on mud/sand*
- *1 (High)—Hydraulic clam dredge. Dredge or trawl gear fished on moderately sensitive habitats (e.g., cobble or boulder)*
- *0 (Very High)—Dredge or trawl fished on biogenic habitat, (e.g., deep sea corals, eelgrass and maerl)*

Note: When multiple habitat types are commonly encountered, and/or the habitat classification is uncertain, the score will be based on the most sensitive, plausible habitat type.

New Zealand: BNS1 Southern Ocean, Longline, Bottom

Moderate Concern

By definition, bottom longline gear will contact the substrate. In this fishery, contact has been made with corals. Therefore, in accordance with the Seafood Watch criteria, an evaluation of ‘moderate concern’ is made.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom**Very High Concern**

The bottom trawl fishery occurs on a variety of habitats that include rocky substrates and seamounts (Ministry for Primary Industries 2013a). Further, benthic invertebrates, corals, and sponges have been returned (by government observers) from bottom fishing gear catching bluenose (Ministry for Primary Industries, unpublished data). In accordance with Seafood Watch criteria, a score of ‘very high concern’ is assigned.

New Zealand: BNS1 Southern Ocean, Trawl, Midwater**None**

In tows classified as midwater trawling, gear is not expected to contact the substrate. Consequently, a score of ‘none’ is assigned to factor 4.1 and 4.2 is not assessed as no mitigation is deemed necessary.

New Zealand: BNS2 Southern Ocean, Longline, Bottom**Moderate Concern**

By definition, bottom longline gear will contact the substrate. In this fishery, contact has been made with corals. Therefore, in accordance with the Seafood Watch criteria, an evaluation of ‘moderate concern’ is made.

New Zealand: BNS2 Southern Ocean, Trawl, Bottom**Very High Concern**

The bottom trawl fishery occurs on a variety of habitats that include rocky substrates and seamounts (Ministry for Primary Industries 2013a). Further, benthic invertebrates, corals, and sponges have been returned (by government observers) from bottom fishing gear catching bluenose (Ministry for Primary Industries, unpublished data). In accordance with Seafood Watch criteria, a score of ‘very high concern’ is assigned.

New Zealand: BNS2 Southern Ocean, Trawl, Midwater**None**

In tows classified as midwater trawling, gear is not expected to contact the substrate. Consequently, a

score of 'none' is assigned to factor 4.1 and 4.2 is not assessed as no mitigation is deemed necessary.

Factor 4.2 – Mitigation of Gear Impacts

Scoring Guidelines

- *+1 (Strong Mitigation)—Examples include large proportion of habitat protected from fishing (>50%) with gear, fishing intensity low/limited, gear specifically modified to reduce damage to seafloor and modifications shown to be effective at reducing damage, or an effective combination of 'moderate' mitigation measures.*
- *+0.5 (Moderate Mitigation)—20% of habitat protected from fishing with gear or other measures in place to limit fishing effort, fishing intensity, and spatial footprint of damage caused from fishing.*
- *+0.25 (Low Mitigation)—A few measures are in place (e.g., vulnerable habitats protected but other habitats not protected); there are some limits on fishing effort/intensity, but not actively being reduced.*
- *0 (No Mitigation)—No effective measures are in place to limit gear impacts on habitats.*

New Zealand: BNS1 Southern Ocean, Longline, Bottom

No Effective Mitigation

Fishing intensity is limited indirectly through catch limits on the species. There is some benthic protection from bottom trawling at a national level, comprising around 30% of the New Zealand Exclusive Economic Zone (Helson et al. 2010). However, these areas were not designed with reference to bluenose fishing activity and so, at best, would provide partial mitigation of the impacts of trawling for bluenose. There is no longline mitigation in place per se where bluenose is fished. In accordance with Seafood Watch criteria, a score of 'no effective mitigation' is assigned.

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

Minimal Mitigation

Fishing intensity is limited indirectly through catch limits on the species. There is some benthic protection from bottom trawling at a national level, comprising around 30% of the New Zealand Exclusive Economic Zone (Helson et al. 2010). However, these areas were not designed with reference to bluenose fishing activity and so, at best, would provide partial mitigation of the impacts of trawling for bluenose. In accordance with Seafood Watch criteria, a score of 'minimal mitigation' is assigned.

New Zealand: BNS1 Southern Ocean, Trawl, Midwater**Not Applicable****New Zealand: BNS2 Southern Ocean, Longline, Bottom****No Effective Mitigation**

Fishing intensity is limited indirectly through catch limits on the species. There is some benthic protection from bottom trawling at a national level, comprising around 30% of the New Zealand Exclusive Economic Zone (Helson et al. 2010). However, these areas were not designed with reference to bluenose fishing activity and so, at best, would provide partial mitigation of the impacts of trawling for bluenose. There is no longline mitigation in place per se where bluenose is fished. In accordance with Seafood Watch criteria, a score of 'no effective mitigation' is assigned.

New Zealand: BNS2 Southern Ocean, Trawl, Bottom**Minimal Mitigation**

Fishing intensity is limited indirectly through catch limits on the species. There is some benthic protection from bottom trawling at a national level, comprising around 30% of the New Zealand Exclusive Economic Zone (Helson et al. 2010). However, these areas were not designed with reference to bluenose fishing activity and so, at best, would provide partial mitigation of the impacts of trawling for bluenose. In accordance with Seafood Watch criteria, a score of 'minimal mitigation' is assigned.

New Zealand: BNS2 Southern Ocean, Trawl, Midwater**Not Applicable****Factor 4.3 – Ecosystem-Based Fisheries Management***Scoring Guidelines*

- *5 (Very Low Concern)—Substantial efforts have been made to protect species' ecological roles and ensure fishing practices do not have negative ecological effects (e.g., large proportion of fishery area is protected with marine reserves, and abundance is maintained at sufficient levels to provide food to predators).*
- *4 (Low Concern)—Studies are underway to assess the ecological role of species and measures are in place to protect the ecological role of any species that plays an*

exceptionally large role in the ecosystem. Measures are in place to minimize potentially negative ecological effect if hatchery supplementation or fish aggregating devices (FADs) are used.

- *3 (Moderate Concern)—Fishery does not catch species that play an exceptionally large role in the ecosystem, or if it does, studies are underway to determine how to protect the ecological role of these species, OR negative ecological effects from hatchery supplementation or FADs are possible and management is not place to mitigate these impacts.*
- *2 (High Concern)—Fishery catches species that play an exceptionally large role in the ecosystem and no efforts are being made to incorporate their ecological role into management.*
- *1 (Very High Concern)—Use of hatchery supplementation or fish aggregating devices (FADs) in the fishery is having serious negative ecological or genetic consequences, OR fishery has resulted in trophic cascades or other detrimental impacts to the food web.*

New Zealand: BNS1 Southern Ocean, Longline, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Bottom

New Zealand: BNS1 Southern Ocean, Trawl, Midwater

New Zealand: BNS2 Southern Ocean, Longline, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Bottom

New Zealand: BNS2 Southern Ocean, Trawl, Midwater

Low Concern

Bluenose are not considered to be an ‘exceptional species’ as defined by Seafood Watch, (i.e., they are not thought to play an ecosystem role disproportionate to their biomass). The approach to fishery management includes explicit consideration of impacts on the aquatic environment, including non-target species, benthic habitats, and biodiversity (Ministry of Fisheries 2010). However, there are no specific plans or management measures addressing ecosystem or food web considerations for trawl or longline bluenose fishing. Still, impacts of the fishery on some ecosystem components (e.g., seabirds) are managed across fishery groups. For example, seabird bycatch reduction devices must be deployed on trawlers ≥ 28 m in length and longliners (New Zealand Government 2010a)(New Zealand Government 2010b). As above, some benthic protection (e.g., closure of seamounts to bottom trawling) occurs at a national level through benthic protected areas (Helson et al. 2010). Because bluenose is not an exceptional species and some efforts are being made to manage ecological impacts, a score of ‘low concern’ is assigned.

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