



25 October, 2009

Mr Andrew Penney
Chair, Science Working Group
Wellington

Via email: Andrew.Penney@fish.govt.nz

Dear Andrew,

Comments on the Revised Draft Bottom Fishery Impact Assessment Standard

These are the comments by the Deep Sea Conservation Coalition (DSCC) on the Revised Draft Bottom Fishery Impact Assessment Standard.

DSCC notes that only New Zealand has so far submitted an assessment to date. While New Zealand is acting responsibly by doing so, other participants engaged in bottom fishing are urged to submit assessments as a matter of priority.

Absence of comment on any section does not imply agreement.

OVERALL COMMENTS

DSCC welcomes the development of a Draft Bottom Fishery Impact Standard.

The draft standard is not sufficiently precautionary in approach as required by para 65 of the FAO guidelines. The proposals focus on thresholds for a move-on rule while in the appendices the focus for identification of VMEs is on multiple encounters without considering the impact of those encounters on a VME. In contrast CCAMLR uses a two level trigger notification and trigger interim closure mechanism.

Any assessment should include information from adjacent RFMO practices and informed judgements e.g. CCAMLR conservation measures, approach and review process.

The standard should refer to the assessment of vulnerable taxa and the appendices of information on vulnerable taxa.

The requirement to undertake an assessment should apply to research activity to ensure research is not used as a proxy for commercial activity. The CCAMLR protocol for research set out in CM24-01 should be a good basis for ensuring that the proposal is research and not commercial activity.

Background to standard

Relevant considerations to this assessment standard are:

1. 2006 UN GA resolution 61/105, which in paragraphs 83-86 provides that States and RFMOs must adopt and implement measures by 31 December 2008 or not authorize bottom fishing on the high seas to proceed.
2. The SPRFMO Interim Measures, adopted in Reñaca, Chile in May 2007. Paragraph 6 of those Measures requires participants to close areas where vulnerable marine ecosystems are known to occur or are likely to occur based on the best available scientific information to bottom fishing unless, based on an assessment undertaken in accordance with paragraphs 11 and 12, conservation and management measures have been established to prevent significant adverse impacts (SAIs) on vulnerable marine ecosystems (VMEs) and the long-term sustainability of deep sea fish stocks or it has been determined that such bottom fishing will not have SAIs on VMEs or the long term sustainability of deep sea fish stocks.
3. The FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, adopted on August 29th 2008. These guidelines show States how to apply 61/105 and provide strong guidance on implementation of the Interim Measures, but do not supercede them: the first two instruments have priority. Some Members at the recent COFI meeting expressed the view that the International Guidelines should be considered as minimum requirements for the management of deep-sea fisheries and the protection of vulnerable marine ecosystems.¹

The UN Fish Stocks Agreement 1995 and the FAO Code of Conduct are also relevant considerations.

Some Key Issues

There are some elements missing in the draft standard put forward. These include that:

1. The environmental assessment criteria make assumptions about the effects of different fishing techniques which are not precautionary or based on the best available information.
2. Bottom trawling: The standard of assessment should ensure that cumulative impacts as well as one off impacts on VMEs and associated biodiversity are considered.
3. The standard needs to consider the catchability and induced mortality of benthic species by different fishing methods. While the standard references the effect of different methods it does not consider whether the quantities applied are appropriate for non-bottom trawling methods. The current observer coverage for longlining is low (only 10 percent) so that the level of temporal and geographic spread of the fishery will not be covered.

¹ COFI Draft Report, para. 57.

4. Information from the New Zealand waters (eg around the sub-Antarctic Islands) and in the Ross Sea (and elsewhere in CCAMLR Antarctic waters) shows that longlines do catch a wide range of sensitive species which can make up a VME.
5. Bottom longlining: The standard needs to consider the effects of different methods eg to manage the significant adverse impacts of longlining. The current observer coverage is low (only 10 percent) for longlining so proposed observer coverage including the level of temporal and geographic spread should be covered in any assessment.

5.0 Assessments

Para. 47 of the FAO Guidelines requires States to carry out assessments to establish if deep-sea fishing activities are likely to produce significant adverse impacts in a given area. The requirements for the assessments are further provided in para. 47. These requirements are detailed, and include baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared.

47. Flag States and RFMO/As should conduct assessments to establish if deep-sea fishing activities are likely to produce significant adverse impacts in a given area. Such an impact assessment should address, inter alia:

- i. type(s) of fishing conducted or contemplated, including vessels and gear-types, fishing areas, target and potential bycatch species, fishing effort levels and duration of fishing (harvesting plan);*
 - ii. best available scientific and technical information on the current state of fishery resources and baseline information on the ecosystems, habitats and communities in the fishing area, against which future changes are to be compared;*
 - iii. identification, description and mapping of VMEs known or likely to occur in the fishing area;*
 - iv. data and methods used to identify, describe and assess the impacts of the activity, the identification of gaps in knowledge, and an evaluation of uncertainties in the information presented in the assessment;*
 - v. identification, description and evaluation of the occurrence, scale and duration of likely impacts, including cumulative impacts of activities covered by the assessment on VMEs and low-productivity fishery resources in the fishing area;*
 - vi. risk assessment of likely impacts by the fishing operations to determine which impacts are likely to be significant adverse impacts, particularly impacts on VMEs and low productivity fishery resources; and*
 - vii. the proposed mitigation and management measures to be used to prevent significant adverse impacts on VMEs and ensure long-term conservation and sustainable utilization of low-productivity fishery resources, and the measures to be used to monitor effects of the fishing operations.*
- i. It is important that the aim of the assessments is to determine if the fishing is likely to produce significant adverse impacts in a given area. The draft Standard sets out paras. 17 and 18 of the FAO Guidelines.*

It is clear from these guidelines that the impacts on the specific sites are to be considered. This has implications for the heavily fished areas: the impacts on each site must be considered, and measures adopted to prevent SAIs on VMEs – or fishing not authorised.

5.1.2 Risk

The risk assessment criteria uses only three categories with large changes between the categories, for example the big jump from none to medium. These large jumps could under-represent the risks in an assessment.

The unit of analysis for the impact assessment for VMEs is currently suggested to be 'VMEs' as a group rather than individual taxa. As more information becomes available (such as the location of different types of VMEs) it may be more appropriate to undertake the impact assessment for different types of VMEs.

In terms of deep-sea fish stocks the unit of analysis should be the stock, however, similar to VMEs, the data availability may constrain the unit of analysis to the species or resource assemblage level. As with VMEs, as more information becomes available it may be more appropriate to move to the stock level.

6. Detection of Vulnerable Marine Ecosystems...

6.1 Detection

DSCC is concerned with the suggestion in this section that *“interim measure 7 is intended to apply in cases of unexpected interactions with VMEs in areas where no other pre-determined management action has been implemented to prevent significant adverse impacts.”*

The draft presumes that all areas where VMEs are known or likely to occur, including “surrogate” areas such as seamounts, have either been closed or else the proposed fishing in these areas is managed to prevent SAIs on the basis of a prior impact assessment (consistent with the FAO Guidelines para 47). This is unlikely to be the case, particularly in the next 5 or more years as new information on VMEs in the South Pacific is accumulated.

Key Principles

DSCC cautions against assuming that *“sporadic capture of a single organism” is not “evidence of a VME and a quantity of by-catch which is considered to constitute evidence of a vulnerable ecosystem.”*

For example, in heavily fished areas any evidence of VME indicator species may well be represented by some fragment or remnant of a more extensive VME which had previously occurred or occupied this area. In any event immediate closure should occur prior to an assessment of the area to ensure the VME and its associated biodiversity is retained.

The FAO Guidelines in part 3.B, paragraphs 14-16, make it clear that vulnerability varies, and that the most vulnerable ecosystems are those that are both easily disturbed and very slow to recover, or may never recover. Even a small disturbance can affect the vulnerability.

We therefore contest the first bullet point assertion in paragraph 6.1 that evidence of a VME needs to be defined in a way which makes the measure implementable at sea. The starting point must be that evidence of a VME needs to be defined in a way which identifies VMEs. If this means that a VME must be closed until it is opened, and that the only alternative is to risk damaging the VME, then that is what needs to be done. The starting point is not how can bottom fishing best be facilitated.

Designation of Taxa constituting evidence of a VME

Participants need to remember that not all species are retained by bottom fishing gear and different fishing gear have different retention rates. The 5th bullet point suggests that only species considered are those “Retained to some degree, and previously observed, in bottom fishing gear;”

The logical conclusion from this based on the FAO guidelines (para 42) is that all areas where species that are recognized as vulnerable to bottom fishing occur or are likely to occur but which will not likely be ‘retained to some degree’ in bottom fishing gear should be permanently closed.

We agree with the criteria for taxa constituting evidence of VMEs but this should include species with late maturity as a characteristic.

The CCAMLR notification system is attached to assist in notifying a VME.

WEIGHT THRESHOLDS

This section does not adequately incorporate the FAO Guidelines.

We agree that “*Bottom trawls are inefficient at sampling benthic organisms, with poor selectivity for some benthic species of concern such as fragile coldwater corals. Bottom trawl benthic bycatches are therefore likely to consist of low weights, even in areas of abundant VME taxa.*”

In addition, “sparse” benthic VME indicator species could be the living remnants of a previously more extensive VME, such as is likely to be the case in heavily or historically heavily fished areas. In such cases a ‘representative’ area or areas of the feature should be permanently closed to allow for some level of regeneration of the VME(s).

The proposed method for deriving threshold weights is logically flawed, since it is based on the median of the cumulative distribution of observed bycatch weights. This is not correlated with actual VMEs, and simply relies on a statistical formulation based on past fishing data, as opposed to data of VMEs. The exercise is to identify VMEs, not to facilitate a certain amount of fishing.

Instead, the threshold weights should be derived by indication that there is a VME present. Any evidence of contact with VME indicator species may constitute an encounter with a VME. This should be the starting point, and the aim must be to ensure that the area remains closed to bottom fishing until an assessment has been undertaken and appropriate measures have been adopted to protect VMEs from significant adverse impacts. This includes ensuring that all vessels cease bottom

fishing in any area where VMES are likely to occur, in addition to the vessel which encountered the VME.

Move-On Rule

To recall, Paragraph 83(D) of UNGA resolution 61/105 mandates “[t]o require members of the regional fisheries management organizations or arrangements to require vessels flying their flag to cease bottom fishing activities in areas where, in the course of fishing operations, vulnerable marine ecosystems are encountered, and to report the encounter so that appropriate measures can be adopted in respect of the relevant site”. Paragraph 7 of the Interim Measures likewise mandates that participants “[r]equire that vessels flying their flag cease bottom fishing activities within five (5) nautical miles of any site in the Area where, in the course of fishing operations, evidence of vulnerable marine ecosystems is encountered, and report the encounter, including the location, and the type of ecosystem in question, to the interim Secretariat so that appropriate measures can be adopted in respect of the relevant site. Such sites will then be treated in accordance with paragraph 6 above.”

It is important to emphasize that the move-on rule as laid out in the UN GA resolution is intended as a measure of last resort to protect VMEs, as a complement to, not a substitute for, impact assessments, identifying and closing areas where VMEs are known or likely to occur, and establishing regulations to prevent significant adverse impacts to VMEs in areas where high seas bottom fishing is permitted to take place. Even where stringently applied, the move-on rule is not likely to be effective in preventing significant adverse impacts to VMEs other than in exceptional cases. As was noted on page 69 of the Assessment, commercial bottom trawls do not retain taxa efficiently, and thus are likely to be of limited value in assessing whether significant adverse impacts have occurred to VMEs.

So the simple question is: is a VME encountered?

The measures put in place must identify the amounts of taxa which will themselves provide evidence of VMEs – bearing in mind that commercial bottom tows (or bottom longline sets for that matter) are unreliable methods of providing such evidence, since, for instance, material will fall out of the nets or be crushed and pass through the net. The test is one of identifying ‘evidence of an encounter.’ The FAO Guidelines make this clear, in paragraphs 67-69 and elsewhere. We may never be able to tell from observer data what damage has been done. This is why bottom fishing should not occur until individual assessments have been done - most likely a benthic survey - and measures put in place.

Penney et al² stated that “[s]uch evidence would not necessarily constitute proof of actual existence of VMEs, and would also not provide adequate evidence of significant adverse impacts on such VMEs. Additional review and comprehensive scientific analysis of all available data, including data from frequent repeated encounters with VMEs, together with additional information indicating likelihood of

² A. Penney, S. Parker, J. Brown, M. Cryer M. Clark & B. Sims, New Zealand Implementation of the SPRFMO Interim Measures for High Seas Bottom Trawl Fisheries in the SPRFMO Area

existence of VMEs in specific areas, would be required to properly identify and map VMEs.”

DSCC is concerned at the numbers used (e.g. for porifera sponges and scleractinia, or stony corals). The IUCN paper³ on FAO guidelines for deep-sea fisheries considered that a single haul constituting more than 5 kg of stony coral or coral rubble or 5 kg of sponge constitutes as significant by-catch indicating the presence of a VME.

In the CCAMLR interim measures for bottom longlines and pots there was agreement that 10 litre or 10 kg basket of all significant species caught in 1200m or 1000 hooks would identify a potential VME which should be closed and subject to further investigation (see CCAMLR Conservation Measures 22-07).

Lastly, we note that in terms of the Interim Measures, VMEs include cold water corals and sponge fields according to footnote 3, which then trigger a report and appropriate measures. This indicates in fact that the 50 kg and 30 kg thresholds (Table 1) are far too high. There are other criteria listed in the IUCN report which do not feature in the table. We also refer to the IUCN report (page 25), a lack of by-catch of species that comprise VMEs is not definitive evidence that they are not present in an area that is fished. It is therefore clear that while the proposed conditions are a worthwhile start, more work needs to be done fully to implement the Interim Measures.

In summary, we recommend thresholds based on what are likely to indicate a VME, and that repeated encounters need to be addressed.

Applying the test ‘is a VME encountered?’ we recommend that the move-on rule is triggered upon any evidence of an encounter with coral, sponges or other vulnerable species. The area should then be subject to an interim closure (eg as occurs with CCAMLR CM22-07) and an assessment to determine whether one or more types of bottom fishing would have significant adverse impacts. Depending on the results of the impact assessments, the area could be reopened to one or more types of bottom fishing activity or permanently closed to protect the VME.

For some species sporadic capture may represent the distribution of the VME given the problem with the gear catching and retaining VME indicator species.

The standard just also considers direct impact and does not consider the indirect impacts of fishing gear e.g. increase sedimentation due to doors stirring up and smothering benthic species.

7.0 Bottom Fishery Impact Assessment Sections

³ Alex D Rogers, Malcolm R Clark, Jason M Hall-Spencer, Kristina M Gjerde, “The Science behind the Guidelines: A Scientific Guide to the FAO Draft International Guidelines for the Management of Deep-Sea Fisheries in the High Seas and Examples of How the Guidelines may be Practically Implemented,” (December 2007).

IMPACT ASSESSMENT

The CCAMLR Fish Stock Assessment Working Group in 2008 noted that a risk assessment framework needs to consider a range of matters and these are relevant to any assessment undertaken particularly for longlining (para 10.30):

- (i) *Not all areas are equal with regard to probability of encounters with or impacts to a VME but information needed to assess such probabilities is very limited.*
- (ii) *Models of likely habitat can be developed based on geomorphological, oceanographic and other environmental data and relating these to observations of where different VME taxa might be found. Observations can include direct observations (using video, benthic sampling equipment) or indirect observations such as by-catch from fisheries.*
- (iii) *An appropriate scale for characterising risk would be 0.5° latitude and 1.0° longitude, consistent with CCAMLR fine-scale areas.*
- (iv) *Different areas will have different risks, e.g. higher risk areas might be seamounts, heads of canyons and depths shallower than 550m.*
- (v) *There will be different requirements for data collection, research and mitigation for different levels of risk and different gear types.*
- (vi) *The assignment of risk would need to be reviewed as new information becomes available.*

BOTTOM FISHING IMPACT

The Assessments need to incorporate the FAO Guidelines.

Para 73 states that: *“States and RFMO/As should assess, on the basis of the best available scientific information, whether DSFs⁴ activities would have significant adverse impacts on VMEs, and to ensure that, if it is assessed, in accordance with Section 5.B of these Guidelines, that these activities would have significant adverse impacts, they are managed to prevent such impacts or not authorized to proceed.”*

Para 74 states that *“7 If after assessing all available scientific and technical information, the presence of VMEs or the likelihood that individual DSFs activities would cause significant adverse impacts on VMEs can not be adequately determined, States should only authorize individual DSFs activities to proceed in accordance with:*

⁴ Note that DSF are defined in para. 8 and 9 as follows:

8. These Guidelines have been developed for fisheries that occur in areas beyond national jurisdiction and have the following characteristics:
 - i. the total catch (everything brought up by the gear) includes species that can only sustain low exploitation rates; and
 - ii. the fishing gear is likely to contact the seafloor during the normal course of fishing operations.

States and RFMO/As should consider, as appropriate, the application of elements of these Guidelines to similar fisheries in areas beyond national jurisdiction, including those targeting medium productivity species.

9. For the purpose of these Guidelines, the fisheries described in paragraph 8 shall be referred to as "deep-sea fisheries" (DSFs).

DSCC Comments on Draft Bottom Fishery Assessment Standard

- i. precautionary conservation and management measures to prevent significant adverse impacts as described in paragraph 65;*
- ii. a protocol for encounters with VMEs consistent with paragraphs 67-69; and*
- iii. measures, including ongoing scientific research, monitoring and data collection, to reduce the uncertainty.*

Note the reference to ‘individual’ DSF activities. Each individual deep sea fishery must be assessed. Where activities would have SAIs on VMEs, they must be managed to prevent such impacts or not authorized to proceed. This means that VMEs cannot be ‘sacrificed’ in exchange for closures elsewhere. The fishing must be managed to prevent such impacts. If they are not, or cannot be, they must not be authorised to proceed.

Where there is doubt about SAIs on VMEs, then there must be precautionary measures to prevent SAIs, as well as a protocol for encounters (the ‘move-on rule’) and measures to reduce uncertainty.

All areas must be subject to conservation and management measures adopted in accordance with interim measure paragraph 6. Such areas where VMEs are known to occur must be managed to avoid SAIs on VMEs. Partial closures, applying the move-one rule without identifying interim VMEs, or sacrificing VMEs, will not achieve this and is incompatible with the Interim Measures and the FAO guidelines.

Instead, paras 70 and 71 of the FAO Guidelines state what is required:

“70. States and RFMO/As should, based on the results of assessments carried out pursuant to Section 5.B, adopt conservation and management measures to achieve long-term conservation and sustainable use of deep-sea fish stocks, ensure adequate protection and prevent significant adverse impacts on VMEs; these measures should be developed on a case-by-case basis and take into account the distribution ranges of the ecosystems concerned.

71. Conservation and management measures pursuant to paragraph 70, may include:

- i. effort controls and/or catch controls;*
- ii. temporal and spatial restrictions or closures;*
- iii. changes in gear design and/or deployment or operational measures (as discussed in the 2006 Bangkok Expert Consultation), including,*
 - reduction of contact between the fishing gear and the seabed,*
 - use of effective bycatch reduction devices, and*
 - use of technical measures to eliminate or minimize ghost fishing; or*
- iv. other relevant measures necessary to achieve the objective of paragraph 70.”*

The performance of each measure depends on many factors related to the particular fishery, ecosystem, and how these measures are implemented. Management measures for DSFs, where applicable, should take account of appropriate biological reference points. Such measures should be accompanied by an effective set of MCS [monitoring, control and surveillance] measures sufficient to ensure compliance with agreed measures.”

These are only some measures, to which the measures detailed in paragraph 7.5 (“Operational Measures to Minimise Benthic Effects of Bottom Trawling”) are relevant. However the test is that cited in para. 70.

As the CCAMLR Commission noted:

“... although fishing gears are likely to be poor sampling devices of VME taxa, and the presence of VME taxa or indicators of VMEs in catches from any of these methods would be evidence that VMEs could be present. Conversely, the absence of VME taxa or indicators of VMEs in the catches did not necessarily represent an absence of VMEs. The degree to which this could be concluded would be dependent on the selectivity and sampling efficiencies of the gears;”

There is clearly a difference in the species sampled by different fishing gear and that needs to be considered when applying rules consistent with the interim measures. The weight threshold and the VME evidence protocol does not consider variation in catchability of methods and focuses on bottom trawling. The approach could result in VMEs being under-estimated than over-estimated. DSCC notes that CCAMLR have adopted a three scale approach of taking precautionary action on VME indicators.

7.1.3 Criteria for assessment:

We attached the CCAMLR list of performance assessment criteria. This is from Conservation Measure CM22-06 Annex A.

We have a number of concerns about the criteria used in the assessment:

Intensity: The intensity criterion should focus on the impact on “ecological” function and processes rather than general “environment” focus.

Spatial Extent: this criterion has been applied to the whole of the SPRFMO area rather than to the vulnerable marine areas or the depth ranges where the target species exists.

The “Extent” consideration should focus on the area at risk as this is the area which is vulnerable rather than comparing with areas of greater or shallower depth which contain different benthic or other species and ecosystems. This criterion should be modified so that it indicates the impact on the depth range of the target species: that is *site specific* (limited to one site), *local* (limited to one seamount or VMEs within 10nm of a site) or *regional* (limited to one identified fishing area).

Overall risk: The focus should be on impact on the ecological processes and functions.

Impact of bottom trawling on VMEs

Given the changes suggested for “spatial extent” then the impact of bottom fishing would be high. Intensity would also be high given the impacts of trawling and the long recovery times of species eg corals, combined with the impact of sea acidification from increased atmospheric carbon dioxide.

North West Challenger orange roughy fishery is clearly an area which has been heavily fished where there must be questions about whether “ecosystem processes” have been “substantially altered across the spatial scale of the ecosystem concerned”.

Impact of bottom linefishing on VMEs

The draft standard does not consider the impact of different methods and consider the spatial scale of methods with a lower impact eg bottom longlining. The assessment also assumes that the gear does not move and thus compound the impact of a longline.

The CCAMLR Fish Stock Assessment Working Group last year assessed a range of movement for bottom longlines based on empirical data from “1 m (CCAMLR-XXVII/19) and 25 m (consistent with WG-FSA-08/56)” (para 10.18). If a figure of 25 metres is used then the impacts area would be 25 times that assessed or 0.3 km² and only an order of magnitude smaller than bottom trawling.

Any assessment needed to note that:

- (i) such analyses will need to take account of the potential for lines to be overlapping, such as would be the case in repeat sets, and that, in these cases, consideration will need to be given as to whether the full impact of fishing occurs during the first interaction, with repeat sets having subsequent negligible effects (but see the conclusions in CCAMLR-XXVII/19):
- (ii) the degree of impact within the footprint is difficult to ascertain because of the absence of empirical data on the effects of the different types of longlines on benthic habitats and VME-taxa. The Working Group agreed that future work to obtain empirical data was needed to reduce this uncertainty on the degree of impact of an individual line. Also, refinement is needed of the methodologies and calculations for determining the footprint (area) affected by the different types of longlines (WG-FSA-08/58) and for estimating the possible impacts on VME-taxa within the footprint as described in WG-FSA-08/53...
- (iii) observed by-catch from longlines may not be a good indicator of interactions of longlines with VMEs because taxa affected by the longlines may not be observed as by-catch when landed (para 10.11). As a result, no by-catch may not mean that there has been no interaction with a VME. However, presence of VME taxa in by-catch may be indicative of the presence of a VME. Although catch rates of VME taxa cannot be used at present, it may be possible to use such rates to estimate the scale of the impacts on VMEs in the future if the catchability of individual VME taxa can be determined.

1. Intensity: As there is not assessment of spatial scales of effort it is not possible to say intensity of impact is low for VMEs. The assessment should be precautionary with consideration of a medium level of impact.

3. Spatial Extent: This needs to consider that targeting of effort in a certain depth range that the extent of impact could be high in this range.

Management and Mitigation: As noted here the level of observer coverage is crucial for obtaining information on VME taxa caught and for assessing benthic bycatch.

The only appropriate level of coverage to assess this fishery is 100 percent.

The assessment of options to minimize the benthic impact of fishing should be undertaken through a workshop with relevant experts (including ENGO experts)..

7.1.4 Information on Status of deepwater stocks to be Fished

The extent of the impact is high given the targeting of orange roughy depths. Given the history of over-exploitation in orange roughy fisheries in New Zealand and around the world, this may require closing areas. It is also important to assess and manage individual species stocks rather than a species complex which is the approach New Zealand applies to deepwater oreos.

Given this uncertainty, it is essential that limits are set on a precautionary basis.

The intensity may not be low medium for some species (e.g. hapuku bass) given the localized nature of some of these stocks and the possibility of serial depletion.

There should be no question that active management is needed: Countries have an obligations under the Interim Measures and the UN Fish Stocks Agreement.

As noted in the latest New Zealand stock assessment report for bluenose:

“The updated estimate of maximum age of 60 years determined by Horn et al. (2008) results in an estimate of natural mortality $M = 0.08$ for a lightly exploited population ($p = 0.01$), and an estimate of $M = 0.06$ for a moderately exploited population ($p = 0.03$), using the method of Hoenig (1983). This range is substantially lower than previous estimates of M for bluenose reported in Plenary reports, such as the 2004 estimate of 0.18 based on a maximum age of 25 years (Paul et al. 2004), or the earlier estimate of 0.3 based on a maximum age of 15 years (Horn & Massey 1989).”

There is no information on the stock structure of bluenose. It is possible that these fisheries are related to the New Zealand stocks and quota areas and could be a straddling stock. As noted in the stock assessment report:

“Stock boundaries are unknown, but similarity in trends in catch and CPUE across fisheries occurring in each of the five New Zealand BNS QMAs [quota management areas] suggests the possibility that there may be a single BNS stock across all these areas, or of some close relationship between stocks in these QMAs. There is a possibility that the long period of relatively stable CPUE observations in the face of increasing catches before the period of decline may be evidence of hyper-stability caused by the replenishment of adult stocks on specific areas or features.”

Given the state of the New Zealand bluenose stocks it is essential that a high level of observer coverage is adopted to obtain improved information to manage this stock or stocks and the impacts of fishing.

Incidental Mortality of deepwater elasmobranchs:

Given that these species are longlived, slow growing, and low productivity species and are part of the by-catch of the orange roughy fishery and the longline fishery it is essential that a precautionary approach is taken in assessing the impacts.

Long Term Sustainability

Catch limits are required to achieve long-term sustainability of fish stocks, also necessary for the implementation of the Interim Measures, is occurring separately from this process.

**Appendices:
MAPPING**

As previously commented, the designation process is not precautionary and will likely result in more impacts on an area. The repetitive encounters approach should lead to closures but is it precautionary?

The mapping evidence approach and the use of spatial databases to assist in the identification of VMEs is supported.

Yours sincerely



Duncan Currie
For DSCC

APPENDIX: KEY BIOLOGICAL INDICATORS OF TARGET AND MAIN BYCATCH FISH SPECIES

Common name	Scientific name	Age when mature	Maximum age	Age when first fished	M - natural mortality	Von B growth <i>k</i>	Risk rating
Alfonsino	<i>Beryx splendens</i> and <i>B. decadactylus</i>	4-5 ?	17 ?	4-5 ?	0.23 ?	0.11 ?	C?
Black cardinal fish	<i>Epigonus telescopus</i>	35-45	100+	35	0.034	0.034	E
Bluenose	<i>Hyperoglyphe antarctica</i>	10	60+	8	0.06-0.08	0.00963	C

Orange roughy	<i>Hoplostethus atlanticus</i>	23-29	120-130	23-29	0.045	0.061-0.070	E
Oreos – black, smooth, Spiky	<i>Allocyttus niger</i> ,	27	153	27?	0.044	0.05	E
	<i>Pseudocyttus maculatus</i>	31	86	21	0.063	0.047-	E
	<i>Neocyttus rhomboidalis</i>	?	100+	?	?	0.067	D?
Ribaldo	<i>Mora moro</i>	?	60+?	?	?	?	D?

REFERENCES: SCIENCE GROUP, MINISTRY OF FISHERIES 2009.

Risk rating see table 5. e = endemic; s= sharks, rays and relatives; ? = unknown

CONSERVATION MEASURE 22-07 (2008)^{1,2}
Interim measure for bottom fishing activities subject to
Conservation Measure 22-06 encountering potential
vulnerable marine ecosystems in the Convention Area

Species	all
Area	see CM 22-06
Season	all
Gear	bottom fishing

The Commission,

Noting the commitment made by Members to avoid significant adverse impacts on vulnerable marine ecosystems (VMEs) from bottom fishing activities,

Acknowledging the current prohibitions on bottom trawling in Conservation Measure (CM) 22-05 (2008) and on deep-sea gillnetting in CM 22-04 (2006) in the high seas areas of the Convention Area,

Agreeing on the need to implement the precautionary approach for managing bottom fisheries with respect to VMEs due to the difficulty in acquiring data on their location, extent and risk of significant adverse impacts,

Further noting the need to acquire additional data during the 2008-2009 season to contribute to assessments and advice on a long-term precautionary approach to avoiding significant adverse impacts on vulnerable marine ecosystems,

hereby adopts the following conservation measure in accordance with Article IX of the Convention and CM 22-06:

Area

1. This conservation measure applies to the same area as CM 22-06.

Definitions

2. The following definitions apply to this conservation measure:
 - (i) Those contained in paragraphs 3 and 4 in CM 22-06 relating to 'vulnerable marine ecosystems' (VMEs) and 'bottom fishing activities'.
 - (ii) VME indicator organism means any benthic organism listed in the Benthic Invertebrate Classification Guide³.
 - (iii) 'VME indicator unit' means either one litre for those VME indicator organisms that can be placed in a 10-litre container; or one kilogram of those VME indicator organisms that do not fit into a 10-litre container.
 - (iv) 'Line segment' means a 1000-hook section of line or a 1200m section of line, whichever is the shorter, and for pot lines a 1200 m section.
 - (v) 'Risk Area' means an area where 10 or more VME indicator units are recovered within a single line segment. A Risk Area has a radius of 1 n mile from the mid-point⁴ of the line segment from which the VME

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indicator units are recovered. However, Members may require their vessels to observe a larger Risk Area in accordance with their domestic laws.

Vessel requirements

3. Members shall require their vessels to clearly mark fishing lines into line segments and to monitor all line segments for the number of VME indicator units.
4. Members shall require their vessels, if 10 or more VME indicator units are recovered in one line segment, to complete hauling any lines intersecting with the Risk Area without delay and not to set any further lines intersecting with the Risk Area. The vessel shall immediately communicate to the Secretariat and to its Flag State the location of the mid-point of the line segment from which those VME indicator units were recovered along with the number of VME indicator units recovered.
5. Members shall require their vessels, if five or more VME indicator units are recovered within one line segment, to immediately communicate to the Secretariat⁵ and to their Flag State the location of the mid-point of the line segment from which those VME indicator units were recovered along with the number of VME indicator units recovered.

Management

6. On receipt of a notification under paragraph 4, the Secretariat shall:
 - (i) record the location of the Risk Area;
 - (ii) within one working day of receipt, notify all fishing vessels in the relevant fishery and their Flag States that the Risk Area is closed; and that, as in paragraph 4, all vessels shall immediately cease setting any further lines intersecting with the Risk Area.
7. On receipt of 5 notifications under paragraph 5 within a single fine-scale rectangle⁶, the Secretariat shall, within one working day of receiving the fifth notification, notify all fishing vessels in the relevant fishery and their Flag States of the coordinates of the fine-scale rectangle, indicating that VMEs may occur within that area. Vessels may continue to fish in the area consistent with paragraphs 4 and 5.

Data

8. Vessels shall report in accordance with Conservation Measure 23-01 total benthos recovered in a 5-day period. To the extent possible VME indicator units for each line segment and the midpoint of each line segment on all lines should be reported in fine-scale data.

Review

9. A Risk Area shall remain closed for any fishery until reviewed by the Scientific

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Committee and management actions are determined by the Commission. Scientific research as agreed by the Scientific Committee shall be allowed in Risk Areas.

10. The Commission will review this conservation measure in 2009, in light of observer, vessel and other data collected during the 2008/09 season, the results of the 2009 Expert Workshop on Vulnerable Marine Ecosystems, any other relevant information, the deliberations of Working Group on Ecosystem Monitoring and Management (WG-EMM) and Working Group on Fish Stock Assessment (WG-FSA), and in accordance with the advice of the Scientific Committee.

¹ Except for waters adjacent to the Kerguelen and Crozet Islands.

² Except for waters adjacent to the Prince Edward Islands.

³ Available from the Secretariat.

⁴ In latitude and longitude.

⁵ This may be through the Flag State or directly to the Secretariat, whichever is the most practicable.

⁶ A fine-scale rectangle is defined as an area of 0.5° latitude by 1° longitude with respect to the northwest corner of the statistical subarea or division. The identification of each rectangle is by the latitude of its northernmost boundary and the longitude of the boundary closes to 0°.

**CONSERVATION MEASURE 22-06 (2008)^{1,2}
Bottom fishing in the Convention Area**

Species	all
Area	see paragraphs 1, 2
Season	all
Gear	bottom fishing

The Commission,

Recognising the commitment made by Members to implement the CCAMLR precautionary and ecosystem approaches to fisheries management by embracing principles of conservation as stated in Article II of the Convention,

Conscious of the urgent need to protect vulnerable marine ecosystems from bottom fishing activities that have significant adverse impacts on such ecosystems,

Noting that United Nations General Assembly Resolution 61/105, adopted on 8 December 2006, calls on regional fisheries management organisations or arrangements with the competence to regulate bottom fisheries to adopt and implement measures to prevent significant adverse impacts of bottom fisheries on vulnerable marine ecosystems and noting further that all CCAMLR Members joined in the consensus by which this resolution was adopted,

Noting also the importance of Article IX of the Convention, including the use of the best scientific evidence available,

Aware of the steps already taken by CCAMLR to address the impacts of deep-sea gillnetting and bottom trawling in the Convention Area, through the implementation of Conservation Measures 22-04 and 22-05 respectively,

Recognising that CCAMLR has responsibilities for the conservation of Antarctic marine living resources, part of which include the attributes of a regional fisheries management organisation,

Noting that all CCAMLR conservation measures are published on the CCAMLR website,

hereby adopts the following conservation measure in accordance with Article IX of the Convention:

Management of bottom fishing

1. This conservation measure applies to areas in the Convention Area south of 60°S; and to the rest of the Convention Area with the exception of subareas and divisions where an established fishery was in place in 2006/07 with a catch limit greater than zero.
2. This conservation measure also applies to the area of Division 58.4.1, north of 60°S.

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3. For the purposes of this measure, the term 'vulnerable marine ecosystems' in the context of CCAMLR includes seamounts, hydrothermal vents, cold water corals and sponge fields.
4. For the purposes of this measure, the term 'bottom fishing activities' includes the use of any gear that interacts with the bottom.
5. Until 30 November 2008, bottom fishing activities shall be limited to those areas for which bottom fishing activities were approved by the Commission in the 2006/07 fishing season.
6. Contracting Parties whose vessels wish to engage in any bottom fishing activities, beginning 1 December 2008, shall follow the procedures described in paragraphs 8 to 12 below.
7. Contracting Parties shall authorise vessels flying their flag to participate in bottom fishing activities only in accordance with the provisions of this conservation measure and Conservation Measure 10-02.

Assessment of bottom fishing

8. All individual bottom fishing activities commencing 1 December 2008 and thereafter shall be subject to assessment by the Scientific Committee, based on the best available scientific information, to determine if such activities, taking account of the history of bottom fishing in the areas proposed, would contribute to having significant adverse impacts on VMEs, and to ensure that if it is determined that these activities would make such contributions, that they are managed to prevent such impacts or are not authorised to proceed. The assessments shall include the following procedures:
 - (i) Each Contracting Party proposing to participate in bottom fishing shall submit to the Scientific Committee and Commission information and a preliminary assessment based on the pro forma in 22-06/A, with the best available data, of the known and anticipated impacts of its bottom fishing activities on VMEs, including benthos and benthic communities, no less than three months in advance of the next meeting of the Commission. These submissions shall also include the mitigation measures proposed by the Contracting Party to prevent such impacts.
 - (ii) The Scientific Committee shall undertake an assessment, according to procedures and standards it develops, and provide advice to the Commission as to whether the proposed bottom fishing activity would contribute to having significant adverse impacts on VMEs and, if so, whether the proposed or additional mitigation measures would prevent such impacts. The Scientific Committee may use in its assessment additional information available to it, including information from other fisheries in the region or similar fisheries elsewhere.
 - (iii) The Commission shall, taking account of advice and recommendations provided by the Scientific Committee concerning bottom fishing activities, including data and information arising from reports pursuant to

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paragraph 8, adopt conservation measures to prevent significant adverse impacts on VMEs, that as appropriate:

- (a) allow, prohibit or restrict bottom fishing activities within particular areas;
- (b) require specific mitigation measures for bottom fishing activities;
- (c) allow, prohibit or restrict bottom fishing with certain gear types; and/or
- (d) contain any other relevant requirements or restrictions to prevent significant adverse impacts to VMEs.

Encounters with VMEs

- 9. Annex 22-06/B provides a notification form for Contracting Parties to use to notify the Secretariat when evidence of VMEs has been encountered, and has not otherwise been reported under Conservation Measure 22-07.
- 10. Contracting Parties, in the absence of site-specific or other conservation measures to prevent significant adverse impact on VMEs, shall require vessels flying their flag to cease bottom fishing activities in any location where evidence of a VME is encountered in the course of fishing operations, and to report the encounter to the Secretariat in accordance with the schedule of the Catch and Effort Reporting System (Conservation Measure 23-01, 23-02 or 23-03, whichever is applicable), so that appropriate conservation measures can be adopted in respect of the relevant site.
- 11. The Scientific Committee shall provide advice to the Commission on the known and anticipated impacts of bottom fishing activities on VMEs, and recommend practices, including ceasing fishing operations if needed, when evidence of a VME is encountered in the course of bottom fishing operations. Taking account of this advice, the Commission shall adopt conservation measures to be applied when evidence of a VME is encountered in the course of fishing operations.

Monitoring and control of bottom fishing activities

- 12. Notwithstanding Members obligations pursuant to Conservation Measure 21-02, all Contracting Parties whose vessels participate in bottom fisheries shall:
 - (i) ensure that their vessels are equipped and configured so that they can comply with all relevant conservation measures;
 - (ii) ensure that each vessel carries at least one CCAMLR-designated scientific observer to collect data in accordance with this and other conservation measures;
 - (iii) submit data pursuant to data collection plans for bottom fisheries to be developed by the Scientific Committee and included in conservation measures;
 - (iv) be prohibited from continuing participation in the relevant bottom fishery if data arising from conservation measures relevant to that bottom fishery have not been submitted to CCAMLR pursuant to subparagraph 12(iii) for

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the most recent season in which fishing occurred, until the relevant data have been submitted to CCAMLR and the Scientific Committee has been allowed an opportunity to review the data.

13. The Secretariat shall annually compile a list of vessels authorised to fish pursuant to this conservation measure and shall make this list publicly available on CCAMLR's website.

Data collection and sharing and scientific research

14. The Scientific Committee shall, based on the best available scientific information, advise the Commission on where VMEs are known to occur or are likely to occur, and advise on potential mitigation measures. Contracting Parties shall provide the Scientific Committee with all relevant information to assist in this work. The Secretariat shall maintain an inventory including digital maps of all known VMEs in the Convention Area for circulation to all Contracting Parties and other relevant bodies.
15. Scientific bottom fishing research activities notified under Conservation Measure 24-01, paragraph 2, shall proceed according to Conservation Measure 24-01 and shall be undertaken with due regard to potential impacts on VMEs. Scientific bottom fishing research activities notified under Conservation Measure 24-01, paragraph 3, shall be treated in accordance with all aspects of paragraph 9 of this conservation measure, notwithstanding the procedures in Conservation Measure 24-01. Consistent with existing reporting requirements in Conservation Measure 24-01, paragraph 4, information regarding the location and the type of any VME encountered, in the course of scientific bottom fishing research activities, shall be reported to the Secretariat.

Review

16. This conservation measure will be reviewed at the next regular meeting of the Commission, based upon the findings of the Scientific Committee. In addition, beginning in 2009 and biennially thereafter, the Commission will examine the effectiveness of relevant conservation measures in protecting VMEs from significant adverse impacts, based upon advice from the Scientific Committee.

¹ Except for waters adjacent to the Kerguelen and Crozet Islands

² Except for waters adjacent to the Prince Edward Islands

**PRO-FORMA FOR SUBMITTING PRELIMINARY ASSESSMENTS OF
THE POTENTIAL FOR PROPOSED BOTTOM FISHING ACTIVITIES
TO HAVE SIGNIFICANT ADVERSE IMPACTS ON
VULNERABLE MARINE ECOSYSTEMS (VMES)**

1. Preliminary assessment of bottom fishing activities – Required Information

1.1 Scope

- 1.1.1 Fishing Method(s) to be used
Longline type (Spanish/auto/trotline/pots)
 - 1.1.2 Area/Subdivision
e.g. 88.1 and 88.2
 - 1.1.3 Period of application
Year
-

1.2 Proposed fishing activity

- 1.2.1 Detailed description of gear
*Please provide a detailed diagram of the gear configuration to be used (see WG-FSA-08/60 for example or diagrams available in the CCAMLR observer logbook). Include details of line-type; line length (length range if necessary); hook type(s); numbers per line and spacing of hooks within a line (per vertical line for trot-lines); weight material and mass; spacing of weights; anchor type; floats and spacing etc. for **each vessel** included in this application/notification*
 - 1.2.2 Scale of proposed activity
Please provide estimates of total numbers of hooks and/or lines to be deployed.
 - 1.2.3 Spatial distribution of activity
Please provide details of SSRUs or geographical regions within the Area/subdivision in which activities will take place including the depth range of fishing activities.
-

1.3 Mitigation measures to be used

Please provide details of modifications to gear configuration or methods of deployment aimed at preventing or reducing adverse impacts to VMEs.

2. Preliminary assessment of bottom fishing activities – Supporting Information

2.1 Assessment of known/anticipated impacts on vulnerable marine ecosystems (VMEs)

Please provide data or information available on the current state of knowledge of impacts of proposed fishing activities on VMEs within the area of activity.

- 2.1.1 Estimated spatial effort footprint
Please provide details of % area covered by fishing effort
- 2.1.2 Summary of potential VMEs present within areas of activity
*e.g. biogenic/geological; habitat area coverage/distribution; fragility/vulnerability and resilience of habitats; species composition/endemism; life history traits.
Please provide details.*
- 2.1.3 Probability of impacts
e.g. low/medium/high/unknown. Please provide details.
- 2.1.4 Magnitude/severity of the interaction of the proposed fishing gear with VMEs
e.g. associated mortality and spatial extent of impacts Please provide details.
- 2.1.5 Physical and biological/ecological consequences of impact

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e.g. loss of physical habitat structure or of keystone species or extinctions

2.2 Estimated cumulative footprint

Please provide an estimated cumulative impact derived from information provided under 2.1.1 to 2.1.5 above and any additional information available from the secretariat (e.g. historical fishing effort; habitat maps).

2.3. Research activities related to provision of new information on VMEs

2.3.1 Previous research

Please provide a summary of research previously carried out in the proposed area of activity by your member state (including national/regional/international research programmes). This should include data collected in the previous season under 2.3.2 and details of data submitted to the secretariat such as:

- *Indirect evidence (e.g. by-catch observation; species identification through sample collection and genetic and morphological analysis; acoustic or geomorphic data collection; other)*
- *Direct evidence (e.g. observations using camera gear or ROVS; other)*

2.3.2 In-season research

Please summarise details of the research planned during the proposed fishing activities by your member state (including national/regional/international research programmes). Please provide details of what data will be collected in order to document evidence of or further knowledge on VMEs within the areas of activities including:

- *Indirect evidence (see examples above)*
- *Direct evidence (see examples above)*

2.3.3 Follow-on research

Please provide details of potential future research resulting from previous/in-season research, including collaborative work with other member states or as part of national/regional/international research programmes including:

- *Indirect evidence (see examples above)*
 - *Direct evidence (see examples above)*
-

NOTIFICATION OF ENCOUNTER VULNERABLE MARINE ECOSYSTEM (VME)

CCAMLR Data Form VME Encounter v2009 NOTIFICATION OF ENCOUNTER VULNERABLE MARINE ECOSYSTEMS (VME)		CCAMLR Ph: 61 3 6210 1111 Fax: 61 3 6224 8744 Email: data@ccamlr.org		
<i>Guidelines for completing this notification are given in Conservation Measure 22-06 To be completed when evidence of VMEs has been encountered, and has not otherwise been reported under Conservation Measure 22-07</i>				
Please submit all data to data@ccamlr.org				
For information click here to see field names in "Instructions"				
(1) GENERAL INFORMATION				
Date of preparation				
Vessel flag				
Vessel name				
Vessel call sign				
Name of observer				
Name of person filling in this form				
Email address of person responsible for data enquiries				
(2) VME Location <i>Insert additional columns as required</i>				
Grid number (link to C1, C2 or C3 data - where applicable)				
Subarea or Division				
SSRU or MA				
Start position	date (dd-mm-yy)			
	time (hh:mm)			
	Latitude (S) - degrees	minutes		
	Longitude (+/-) - degrees	minutes		
End position	Sea floor depth (m)			
	Latitude (S) - degrees	minutes		
	Longitude (+/-) - degrees	minutes		
	Sea floor depth (m)			
Fishing or sampling gear				
Method of determining the encounter - Enter 'X' if method used				
(a) in-situ photographic observation				
(b) Presence of VME-associated organisms in the catch				
(c) Acoustic profile				
(d) Presence of habitat feature				
Type of VME				
(3) Habitat-forming organisms - Complete this section if methods (a) or (b) used, Enter 'X' if present				
Large/erect sponges				
Small/low sponges				
Stalked Crinoids				
Gorgonians				
Scareships				
Sespeas				
Hydrocoral (syllisternoid)				
Black Coral (antipatharian)				
Hard coral (scleractinian)				
Low encrusting (bryozoans, ascidians)				
Erect bryozoan				
Tubeworms				
Bivalve bed				
Brachiopod bed				
Bioturbators				
Other (please specify)				
(4) Habitat feature - Complete this section if method (d) used, Enter 'X' if present				
Seamount				
Hydrothermal vent				
Cold seep				
Canyon system				
Other (please specify)				
(5) Comments				