

Deep-sea Fisheries Management: Challenges and Opportunities

Report of a TNC/IUCN Workshop 18–20 January 2011 | Arlington, Virginia

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FAO Guidelines but have not as yet identified where VMEs are or are likely to be found.

y Assessments should be open to review by relevant science working groups and by other States. Independent reviews of assessments should be welcomed

y While VMEs are to be identified through an FAO-approved process and EBSAs through a CBD-approved process, the criteria for identification of VMEs and

IUCN provided an overview of governance arrangements for deep-sea fisheries. It was noted that deep-sea fisheries discussions tended to focus on bottom-contact fishing—that is the capture of fish with gear that is likely to contact the seabed, though the issue is broader as the removal of large quantities of biomass from the water column above may also have an effect on deep sea communities and ecosystems. The importance of the United Nations Convention on the Law of the Sea was noted, together with the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (the United Nations Fish Stocks Agreement). Though all States have rights and obligations under the Law of the Sea, there has been a tendency to focus on the rights and not the obligations. States through the United Nations General Assembly in recent years have adopted annually two omnibus resolutions, one on Sustainable Fisheries and the other on Oceans and Law of the Sea. The Sustainable Fisheries resolutions, most notably 61/105 adopted on 8 December 2006 and 64/72 adopted on 4 December 2009 have included language with respect of bottom fishing. Language adopted in paragraphs 80 and 83 to 87 of resolution 61/105 and paragraphs 113 to 117 and 119 to 127 of resolution

3.1 Review of Implementation of the relevant paragraphs of UN General Assembly Resolution 61/105 and 64/72 and of the FAO Guidelines

In a presentation reviewing implementation of the relevant paragraphs of UN General Assembly resolutions 61/105 and 64/72, it was noted that resolution 61/105 addressed the need to prevent significant adverse impacts to

RFMOs are trying to implement the

have focused on areas where there are high densities of corals or sponges and have not taken into consideration low densities or other species that may constitute a vulnerable marine ecosystem. A move-on rule is often the only management measure in place, but it is of limited value, especially with respect of mobile gear, such as trawls. The question on sustainability of the target stocks remains largely unaddressed. The relevant UN General Assembly resolutions call on States to not authorize bottom activities until measures are in place to avoid significant adverse impacts, but this has largely not been implemented.

There was then a presentation on implementation of the FAO International Guidelines that included discussion of an FAO Workshop on the implementation of the Guidelines organized in Busan in May 2010. The presenter highlighted that all RFMOs are trying to implement the International Guidelines, but are facing technical difficulties, for example on how to interpret significant concentrations of organisms. There has been a focus on corals and sponges and to some extent there is a sense that interests from the coral and the sponge communities has hijacked discussion of what constitutes a vulnerable marine ecosystem. RFMOs have not succeeded in how to get a balanced approach on other species. There is a need for guidelines on how to implement the International Guidelines.

The presenter noted that RFMOs are either adopting closures (all short term) or move-on rules. A move-on rule does not protect static vulnerable marine ecosystems, and there should be some thoughts to alternatives options, but not much has been considered as yet. Further guidance is needed on a number of subjects, for example what is meant by “functional significance of habitat”. A “predictive habitat model” could help all RFMOs if one could be developed to predict likely locations of vulnerable marine ecosystems. Further research should then be encouraged on those areas. RFMOs would welcome a forum in which they could work together or a suite of best practices that they

could use. A number of questions still require further development, guidance and/or clarification to improve the implementation of the FAO guidelines, including:

- criteria to interpret “significant concentrations”;
- evaluation of usefulness of options for risk mitigation;
- best practices for exploratory fisheries protocols that incorporate both ecosystem considerations and industry concerns;
- indicators for VME encounters;
- guidance on conditions that may influence the effectiveness of management measures;
- development of impact assessments that are not only for corals and sponges;
- mapping of VME occurrences.

The presenter also highlighted that access to detailed information should be improved and that further efforts should be done to build capacity to implement the FAO guidelines. Scientific working groups of RFMOs should bring in other relevant experts when needed.

3.2 Discussion followed in reaction to the morning’s presentations and guided by the following questions:

- Of the policy tools presented, which are the most appropriate to address management of deep sea fisheries within an ecosystem context?
- Is it correct to focus on vulnerable marine ecosystems and potential significant adverse impacts to those ecosystems?
- Does resolution 61/105 have the necessary elements? If not, which are missing or how can the existing elements be enhanced to facilitate implementation at national and regional level?
- Which are the 3-5 top priority actions that countries/RFMOs should tackle to facilitate implementation of resolution 61/105?

Encounter protocols generally include triggers for corals and sponges, but triggers for other species and ecosystems are needed.

Many were of the view that there was a need for guidelines on how to implement the FAO International Guidelines. Much remained unresolved, for example what was a significant concentration. Several participants were of the view that too much emphasis had been placed on the role of corals and sponges in identifying vulnerable marine ecosystems to the detriment of other species. Encounter protocols generally included triggers for corals and sponges; there was a need for triggers based on criteria for other species and ecosystems. Additional guidance was needed on the functional significance of habitats and life history traits of other species. Additional consideration was needed of the long-term sustainability of deep-sea fish stocks as much of the work to date on the UN General Assembly resolutions had focused only on the protection of vulnerable marine ecosystems. RFMOs needed advice from a wider group of experts, but how could that be accomplished? RFMOs would benefit from a coordinated effort to develop, test and document the integration of GIS data, mapping software for ecosystem features and fishing footprints, but how could that be done? How could one develop and test predictive habitat models and life history models for vulnerable marine ecosystems?

It was noted also that while the UN General Assembly resolutions themselves applied only to deep-sea fisheries in the high seas (beyond national jurisdiction), the FAO International Guidelines provide that Coastal States may apply the Guidelines within their jurisdiction, as appropriate. Many participants were of the view that the Guidelines are appropriate and should be applied to bottom fishing within EEZs. Some were of the view that under the UN Fish Stocks Agreement, Coastal States would have an obligation to apply the International Guidelines to areas within their jurisdiction for straddling fish stocks.

Participants discussed the need to bring nongovernmental biodiversity and fisheries stakeholders closer together. An example could be through collaboration on parallel or

joint work such as the application under the CBD of criteria to identify ecologically and biologically significant areas and through the FAO International Guidelines of vulnerable marine ecosystems, as both use much of the same criteria. It could be helpful to bring the scientists working on each subject together. It was encouraging that the FAO and CBD secretariats seem to be collaborating more now. Some participants highlighted that ownership of the debate by the fisheries stakeholders is very important. Harmonizing terminology is also an important element to consider. Target 6 of the CBD revised strategic plan could serve as an example as it includes key operational phrases from both communities that may help them to reach common ground. It was noted that the fishing community is suffering from “biodiversity fatigue” and often automatically reacts negatively to biodiversity language, in particular “marine protected area” as it sees MPAs as areas that are determined by others and imposed on them, usually restricting fisheries access, with no chance for input from fishers. It was also noted that it would be helpful if States sent the same representatives to both conservation and to fisheries meetings, thus ensuring that they are aware of what they agreed to in other fora.

Missing within the UN General Assembly resolutions was reference to the recovery of previously impacted areas. Some States argue that where heavy fishing has taken place, vulnerable marine ecosystems are now gone and thus bottom fishing (trawling) should continue. However, remnants of the vulnerable marine ecosystems may remain and these could recover. Options for setting aside areas for recovery could be considered. Some participants also raised the point that it is not always clear what should be done in areas subject to scientific uncertainty.

3.3 Possible actions and recommendations identified in the discussion included:

- Revise the concept of vulnerable marine ecosystems so that it includes deep-sea fish assemblages as well as sponges and corals.

Deep sea squid in the Southern Ocean.
Photo Credit: Alex Rogers-NERC ChESSO project.

boundaries of the current closed areas and to identify other areas where VMEs occur. In the Southwest Atlantic, VMEs have been identified based on the results of a Spanish habitat-mapping program. It is worthy to note that a proposal of protected area (~41,300 km²) in the Southwest Atlantic high-seas was recently presented to the European Union. In the Southeast Atlantic, VME surveys have been undertaken in the high-seas by Spain in collaboration with Namibia. The results of these studies are contributing significantly to the identification of VMEs in the SEAFO area.

A presenter noted that deep-sea high seas fisheries can be sustainable. All types of fishing

70% of fishing vessels in some areas report that one should reverse management areas by catches of a single species only, thus one must not talk about marine protected areas but conclude that there is unreported and misreported fishing, and information about by-catch and associated species, critical to evaluate effects on ecosystem, is missing. The presenter said that accurate identification of all catch and bycatch by species was needed. Assessment of stock by structure, also genetic, length, weight, age and reproductive studies was needed. Assessment of tropic linkages (gut contents, lipid biomarkers) was needed. One can use modeling methods and can identify more than 90% of seamounts, but may include inaccuracies. Management approaches should be precautionary and adaptive, with set precautionary harvest levels and appropriate biological reference points based on scientific assessment of stocks. Move-on rules should be based on scientifically determined trigger levels. With an adaptive management approach, revision would be incorporated as necessary. The presenter said that spatial protective measures to include areas closed to bottom fishing where damage may accumulate was needed. Marine protected areas were needed to improve the management of multispecies fisheries. MPAs need careful placement to ensure maximum benefit with minimal closures. More sectoral conflicts in the future, for example between fishing and mining interests can be expected. Marine spatial planning on the high seas to avoid or minimize such conflicts will be needed. Ownership and exploitation rights in the ocean should be examined. Rights-based management could be a way forward but would need a legal framework to apply in the high seas. Enforcement was also an issue to be addressed through technology, port state measures, intelligence, aggressive prosecution and severe penalties for infractions.

Another presenter said that stock assessments were perhaps overrated because of the difficulty in collecting data. There was a perverse incentive in that the more likely a potential provider thought that data were to be shared, the more likely that provider might seek to restrict such data. The presenter suggested

There is often insufficient data to determine stock structure, but molecular genetics is helping. For stock size, the following are helpful: trawl surveys, time series, acoustic surveys, egg

- with fishing industry on how to use acoustic survey data for stock assessment.
- y Data should be shared with other States, with relevant international organizations and with other interested parties. Scientists need data to do their work.
 - y Concern was expressed about the quality of data, particularly when relying only on commercial data.
 - y It may not be possible to know the full spatial distribution of a species, but the location where it was fished must be known.
 - y Risk assessment and risk management should be linked, and there should be an understanding of what risks do the management decisions carry.
 - y How do we balance misses and false alarms? We are much more risk intolerant to misses than to false alarms. False alarms can upset fishers and can be unhelpful.
 - y Social and economic considerations should be included in a risk assessment dialogue. The standard scientific risk assessment typically includes ecological considerations only.
 - y There will be a review this year of the UN General Assembly resolutions with respect to bottom fishing. It will be helpful to focus on implementing these resolutions. States have made commitments, including to not allow their vessels to fish in the absence of prior assessment. They should fulfill their commitments.
 - y Some States may be of the view that they have complied with the language of the resolution should fulfill their

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4 | BREAK-OUT GROUPS

The workshop then divided into two breakout sessions, each charged to provide recommendations to improve the tools and arrangements for deep sea management, taking into account the UN General Assembly resolutions, the FAO International Guidelines and other relevant sources. Ideas and views expressed in these sessions included: The relevant UN General Assembly resolutions call on RFMOs and Flag States to conduct assessments to determine whether bottom fishing would be likely to have significant impacts on vulnerable marine ecosystems, and if so to manage these activities to prevent such impacts, or not authorize them to proceed. A view was expressed that if operators followed proper assessment procedures, protection for VMEs could largely be achieved. If no assessment has been done, fishing should not be allowed. Lack of political will has hindered progress on the conduct of assessments in accordance with paragraph 47 of the FAO International Guidelines. There was a view that the assessments as called for in paragraph 47 have only been done through some RFMOs, and specifically only with respect of the Southern Ocean (CCAMLR) and in the Northwest Pacific (by relevant Flag States). A concern was expressed that the quality of assessments done for the Northwest Pacific was poor. A full assessment has not been done with respect of the Northwest Atlantic though

Deep sea urchins on Rumble V Seamount, Kermadec Ridge, off New Zealand (left). Photo Credit: NOAA-GNS-NIWA.

Stone Crab (below) Photo Credit: NIWA.

The UN General Assembly resolutions lack guidance on how to proceed if the risk assessment shows uncertainty with respect to the likely level of impact with a VME.

some members of NAFO are of the view that their efforts are adequate. Some RFMOs are requiring assessments for new and exploratory fisheries. The UN General Assembly resolutions lack guidance on what to do if the risk assessment shows uncertainty in the likely level of impact. Efforts should be undertaken to resolve such uncertainties or adapt management measures to reduce impacts.

With respect to UN General Assembly resolution 61/105 it was noted that this had been a compromise that provided for creative misunderstanding to allow continued bottom fishing while affording protection for the seafloor. Some States had favored a ban on all bottom fishing and others had opposed this approach. Some States and operators were of the view that in areas where there had been bottom trawling for thirty years (as an example), there was no need to conduct a risk assessment, as the risk of further harm was so low. There was an uneven commitment to application of the resolution language. Some were of the view that some States were unwilling to implement the UN General Assembly resolution language.

With respect to implementing paragraph 47(ii) of the Guidelines that call for “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;” it was noted that data may be lacking to allow for implementation. Where RFMOs exist there may be a problem with access to data and information in sufficient detail to allow for credible assessments. For example, there may be sufficient information with respect to the exploited resource, but not for associated biodiversity or habitats. Current data are often too aggregated to allow for an assessment of a baseline of vulnerable marine ecosystems. Temporal resolution of vulnerable marine ecosystems linked to daily catch records is needed. Even where data are available, there may be no RFMO in place to use the data. Flag States would need to collaborate if fishing in the

same area. It was recommended that FAO coordinate a group to serve as an intermediary broker. This group should be a fair broker, credible to industry, States and the conservation community. At the same time the group would need to be independent of States and industry and would need to maintain the confidentiality of the information.

It was recommended that RFMOs request or require data at the most detailed level possible. RFMOs would need access to raw data as it was collected and before it was aggregated. However, confidentiality issues put legal limits onto the provision of these RFMOs request

allow for the establishment of sustainable takeexchange and publication of information. levels. All new series should be exploratory A view was expressed that political will to until such time as independent assessments ensure compliance was needed. Some were of have been conducted. There was a need for the view that the U and U of IUU shing further information and assessment of bycatch should fall away since unreported and unregu

Some progress has been made with respected shing is not consistent with the of the collection, exchange and publication of obligation to contribute and exchange scienti c scienti c information, though more is needed. information, catch and shing effort statistics, It was noted article 119 of the UN Convention and other data relevant to the conservation of on the Law of the Sea provides an obligation sh stocks. Others favored retaining the uni on States that "Available scienti c information, ed IUU concept.

catch and shing effort statistics, and other A view was expressed that while the work data relevant to the conservation of sh stocks shop had focused on deep-sea series, the shall be contributed and exchanged on a regu issue was broader and 2OS 8Tc T* [20(r)-6(At)-23

lar basis through competent international organizations, whether subregional, regional or global, where appropriate and with partici pation by all States concerned." Con dentiality concerns should not be a barrier to full imple mentation of this article of UNCLOS and efforts to use economic incentive to deal with the con dentiality issues should be encour aged, in particular looking into the application of access rights. Efforts are also underway in other fora, for example the International Seabed Authority, the Convention on Biodiversity, to encourage the sharing,

5 | EXCERPTS OF CERTAIN RELEVANT PARAGRAPHS FROM THE INTERNATIONAL GUIDELINES FOR THE MANAGEMENT OF DEEP-SEA FISHERIES IN THE HIGH SEAS

Characteristics of species exploited by deep-sea fisheries

13. Many marine living resources exploited by DSFs in the high seas have biological characteristics that create specific challenges for their sustainable utilization and exploitation. These include: (i) maturation at relatively old ages; (ii) slow growth; (iii) long life expectancies; (iv) low natural mortality rates; (v) intermittent recruitment of successful year classes; and (vi) spawning that may not occur every year. As a result, many deep-sea marine living resources have low productivity and are only able to sustain very low exploitation rates. Also, when these resources are depleted, recovery is expected to be long and is not assured. The great depths at which marine living resources are caught by DSFs in the high seas pose additional scientific and technical challenges in providing scientific support for management. Together these factors mean that assessment and management have higher costs and are subject to greater uncertainty.

Vulnerable marine ecosystems

14. Vulnerability is related to the likelihood that a population, community, or habitat will experience substantial alteration from short-term or chronic disturbance, and the likelihood that it would recover and in what time frame. These are, in turn, related to the characteristics of the ecosystems themselves, especially biological and structural aspects. VME features may be physically or functionally fragile. The most vulnerable ecosystems are those that are both easily disturbed and

very slow to recover, or may never recover.

15. The vulnerability of populations, communities and habitats must be assessed relative to specific threats. Some features, particularly those that are physically fragile or inherently rare, may be vulnerable to most forms of disturbance, but the vulnerability of some populations, communities and habitats may vary greatly depending on the type of fishing gear used or the kind of disturbance experienced.

16. The risks to a marine ecosystem are determined by its vulnerability, the probability of a threat occurring and the mitigation means applied to the threat.

Significant adverse impacts

17. Significant adverse impacts are those that compromise ecosystem integrity (i.e. ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts should be evaluated individually, in combination and cumulatively.

18. When determining the scale and significance of an impact, the following six factors should be considered:

- i. the intensity or severity of the impact at the specific site being affected;
- ii. the spatial extent of the impact relative to the availability of the habitat type affected;
- iii. the sensitivity/vulnerability of the ecosystem to the impact;

A sea lily (crinoid) at 1876 meters depth on Kawio Barat submarine volcano. Photo Credit: NOAA Okeanos Explorer Program, INDEX-SATAL 2010.

- iv. the ability of an ecosystem to recover from harm, and the rate of such recovery;
- v. the extent to which ecosystem functions may be altered by the impact; and
- vi. the timing and duration of the impact relative to the period in which a species needs the habitat

Wednesday, 19 January 2011

8:45 a.m. Coffee/tea will be available

9:00 a.m. Alex Rogers by video link: Managing uncertainties

9:35 a.m. Jeff Ardron: Advances in information and understanding of deep sea fisheries

10:05 a.m. Francis Neat: Data and research for managing sustainable deep sea fisheries

10:30 a.m. Coffee break

11:00 Discussion (Facilitator: Carmen Revenga, TNC)
Discussion will focus on improving data availability, identifying and prioritizing requirements for data reporting under resolution 61/105.

Black-bellied rose shrimp shelter within a mass of Lophelia. Photo Credit: Lophelia II 2010 Expedition, NOAA-OER/BOEMRE.

Some questions the group may want to address include:

1. What data are necessary to sustainably manage deep-sea fish stocks? Which deep sea stocks currently have sufficient information for sustainable management within an ecosystem context?
2. Which are the major data gaps and how to improve them?
3. How can accessibility to deep sea fisheries data and ecosystems be improved?
4. How to solve proprietary data issues? Do issues related to data limitations and accessibility apply equally within and beyond national jurisdiction?
5. Can the effects on deep-sea fish stocks of IUU fishing be estimated with any accuracy?

12:30 p.m. Lunch

1:30 p.m. Breakout session: Recommendations for improvement in deep sea fisheries management

The group will be divided into two. Each breakout group will build upon the main elements identified in the previous sessions. The main purpose of the breakout groups will be to focus on specific recommendations to improve:

- The tools and arrangements for deep sea fisheries management such as the UNGA resolutions; the FAO guidelines etc.
- and the implementation of these tools, taking into account lessons learned and successful experiences that could be replicated

3:30 p.m. Coffee break

4:00 p.m. Breakout session: Recommendations for improvement in deep sea fisheries management

5:00 p.m. Meeting adjourns for the day

Thursday, 20 January 2011

9:15 a.m. Report from breakout groups (Facilitator: Harlan Cohen, IUCN)

10:30 a.m. Coffee break

10:45 a.m. Consolidation of recommendations and identification of next steps to carry them forward.

12:30 p.m. Lunch
Workshop adjourns

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