

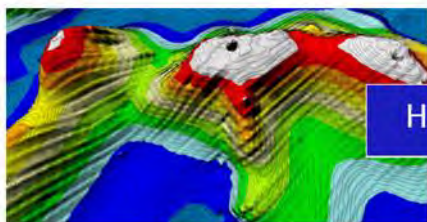
7th Annual Meeting of the Commission

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Vulnerable Marine Ecosystem (VME), Significant Adverse Impact, Ecosystem-based Approach, Precautionary Approach, Encounter Protocol, Sustainable Management, Rational Use...What have we missed?

High Seas Fisheries Group



High Seas Fisheries Group Incorporated

Vulnerable Marine Ecosystem (VMEs)
Significant Adverse Impact
Ecosystem-based Approach
Precautionary Approach
Encounter Protocols
Sustainable Management
Rational Use

What Have We Missed?^{1, 2}

South Pacific Regional Fisheries Management Organization
7th Commission Meeting

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Executive Summary

The High Seas Fishery Group (HSFG) raises again the failure of those with the mandate for management of deep-sea fisheries, especially in New Zealand, to satisfy the needs to ensure that deep-water trawl fisheries in the Southwestern Pacific Ocean are sustained and so continue to contribute to the welfare of the relevant societies. Here, we address in particular the increasingly obsolete concepts of threshold rules and move-on procedures implemented in attempts at conservation that many believe cause as many problems as they are intended to solve.

The HSFG finds it lamentable that processes continue to be championed in the face of evidence that these management processes do not work, will not work, and thus should be abandoned.

The HSFG supports the execution of basic zoological and ecological studies of deepwater benthic communities that contribute to societies' understanding of marine processes. However, we believe that it is worse than unhelpful to continue to justify this work on the basis of political resolutions that, even at the time they were adopted, appeared ill-informed, as a consequence of heavy lobbying by a small group of advocates. Lamentably, the HSFG concludes that the consequences of this lobbying have at times been counterproductive and calls for opening a new chapter on dealing with the issues of conservation and rational use of high seas fisheries.

Central to the approach is the need to move beyond the often employed but usually empty rhetoric of *'using the best information available'* and to seek to use it in full and in good faith. The incentives of all those involved in the process of governance must be fully recognized to understand the reasons why particular policies are pursued, not least objectives that are not fully disclosed.

The HSFG believes that current policies employ methods of conservation that have become widely discredited but remain in effect because of efforts by a small coterie of advocates. We strongly endorse the need for an open and in-depth review of existing policies and evaluation as to whether they can ever provide the results that were intended by the full expression of the oft-repeated UNGA resolutions on sustainable fisheries and the implementation of the Law of the Sea Convention.

Background

It takes a particular type of person to embrace fishing on the high seas, and of these a much smaller set who are able to detect and track their target with meticulous precision up to a kilometer below the surface, and two kilometers behind their vessel. Likewise, it takes a particular type of entrepreneur to develop and embrace such fisheries given the risks to their investment and the dependence of shore-bound workers and crews at sea in accumulating the knowledge of the seas in which they operate, both on the surface, subject to all weathers but also the interaction of deep ocean currents and rugged seafloor topography. When these endeavours are successful (and many fail to master the skills required), food is landed at the dock, livelihoods are sustained, jobs are created often in the most unexpected of places, and wealth is created from their efforts. No words can describe the feelings of a crew returning to port from a long and successful trip.

No one should be surprised then, that these people well understand and accept what is required to sustain their fisheries and their livelihoods. This is not only for managing the resources but ensuring that the protocols of governance are, in current management jargon, "fit for purpose". This has not happened, is not happening, and will not happen, given the flawed and internally inconsistent

process by which the current management protocols for management of deepwater fisheries in the Southwest Pacific Ocean were devised and continue for the conservation and management of the deep-water fishery.

We see our fisheries bureaucracy insisting on adhering to procedures that even they admit do not achieve their management goals. Lamentably, what those goals are, or should be, has been lost as those with the mandate to implement the management goals, have captured defining the goals and in turn themselves have been captured by the process.

New Zealand and Australia have led the way in devising the bottom fishing measures in this forum. At the outset, the process was rushed as it was driven by the need to implement controls on the South Pacific mackerel fishery. At the time, the HSFG cautioned members (including New Zealand, Australian and Chilean officials) that their proposal to limit effort and impose controls through gross tonnage registered would cause a race to fish. Despite our cautions, the officials went ahead. The resultant scramble for tonnage, as predicted, collapsed the South Pacific mackerel fishery resulting in losses of revenues of at least three billion dollars a year! This is a shameful record, and reflects poorly on SPRFMO.

The HSFG highlights this failure, as once again we find that the advice and experience of HSFG members is ignored. Best available information has clearly not been properly used and applied. Computer-model predictions are given a higher status than actual on-the-grounds, albeit contrary, experience and information. Measures are not meant to close fisheries, but to enable their rational, sustainable use. Members have manipulated or misrepresented scientific concepts and outdated resolutions.

Regrettably, many RFMOs appear captured by myopic, monocular single-issue, well-funded environmental lobbyists with no apparent mandate but to themselves and maintaining funding and being sustainable themselves.

HSFG believes that government officials have misinterpreted the precautionary approach to conservation far beyond what was expected during the UNGA debates. Science providers have used this issue to get lucrative research contracts, funding for ill-conceived conceptual models and undertaking research voyages while at the same time ignoring “the best available information” that was at their disposal. Yet SPRFMO’s convention mandates that they need to be considered. This paper, we hope, points out some of the many fundamental flaws in how this Commission has failed its mandate, and does not take a balanced and broad perspective of the issues that should be addressed. We urge those at this meeting to consider our views.

We need to return to examine the beginning of the process

Critical components of current management and conservation procedures are a mess. How, after more than a decade, can key concepts with critical relevance to how our fishery is managed, remain vague to the point of incomprehension to some, of confusion to others and of contention to all? Words have meanings. Words have consequences. Yet scientists and managers use terms with technical and non-technical meanings interchangeable in contexts that demand clear, consistent scientific understanding and in situations where the discourse simply reflects efforts of persuasion – getting the spin right- and political posturing. In our business, product that is not fully described accurately in terms of species, size composition, grade and product type risks loss of market credibility for the operator if not legal consequences - it is never ever considered as a management option. Thus we are astounded that words with well understood meanings are given new interpretations by fishery managers and researchers that we believe are for attracting funding from

those not familiar with the issues. Our requests for clarity echo back unanswered as simple questions remain ignored.

To understand our industry's situation today we must review the foundations upon which the critical components of our current conservation and management measures are based and are the cause of the current consternation of the fishing industry.

The United Nations General Assembly 2006 Resolution 61/105

The United Nations General Assembly (UNGA) is the world's peak political body with the mandate to collectively address issues of global importance. Countries select their representatives from among their very best legal minds, a reflection that their business is a highly-evolved legal process with consequences along multiple dimensions. Within countries the ministry responsible for international affairs is usually the 'top dog' in the bureaucratic pack and this dominance filters down through national legislation. The text of the New Zealand *Fisheries Act 1996* starts An Act—(a) to reform and restate the law relating to fisheries resources; and (b) ***to recognise New Zealand's international obligations relating to fishing.***

Resolutions, such as UNGA 61/105, though non-binding, have enormous influence at the national level and are usually accepted as a *fait accompli* and the marching orders. Fisheries ministries in the world of foreign and external affairs are truly the minnows. As a political agency, the UNGA is, naturally subject to enormous pressures by lobbying groups both through its working groups and from the members themselves. This process determines the shaping of the debate and the outcome (usually pre-drafted, if not pre-agreed) at the General Assembly and then in how resolutions are handled back at national levels. In New Zealand, consultations were held with the fishing industry and environmental groups. Ministry staff then drafted the New Zealand position that, understandably, reflected a ministerial view as to what the policy would be and government lawyers took this to New York.

The final 21 page resolution on Sustainable Fisheries was first subject to intense review by representatives from countries who wished to be part of that debate. New Zealand and Australia were deeply involved, indeed leaders, in the New York discussions giving rise to the tabling and adoption of the resolution, though no documentation is available as to what happened or how it happened in the behind-the-scenes discussions. Lobbyists claiming to represent the environment used this time to push strongly for the views they held and the values they believed were at stake and this all happened during a time when many lobbyists were pushing to get high seas trawling banned altogether.

It was considered by many that the reference in earlier Resolution 59/25 to the "impact of destructive fishing practices, including bottom trawling that has adverse impacts on vulnerable marine ecosystems" was a conservation accomplishment given the reaffirmation of this text in subsequent Resolution 61/105. But what did it mean? Some would reasonably define any fishing as destructive, after all it does require the removal of biodiversity that is vulnerable to capture by the fishing gear in use. By thinking, even just a little, it will be apparent that any and all forms of food production involves some form of ecological destruction. Sustainable agriculture means that there will be no return to climax and undisturbed terrestrial ecosystems within, e.g., 20 years or as long as the agriculture is sustained. The concept of destruction in the context of food production, unqualified, reduces to absurdity as it does in these UN resolutions. The grammatical pendant, in the opening sentence to this paragraph, might argue that the nominal clause could be a subject, an object or a complement. So which was it intended to be? Does, or did anyone know? If is 'subject', then much deep-sea trawling is 'off the hook' as it is not destructive. The use of the inclusive

‘including’ does provide some flag waving but otherwise adds nothing but potential confusion to the careful reader.

This nonsense continues. For example, para 66 notes “protect vulnerable marine ecosystems, including seamounts, hydrothermal vents and cold water corals, from destructive fishing practices, recognizing the immense importance and value of deep sea ecosystems and the biodiversity they contain.” This begs the question: while now often ridiculed, it equates seamounts with hydrothermal vents! Further, no one has yet demonstrated that hydrothermal vents are being destroyed by trawling – given their ability to often rapidly recover. Yes, coldwater corals are part of the deepwater ecosystem. But, are they *the* deepwater ecosystem? Some lobbyists argue that a branch of coral, because smaller organisms can be found crawling on it, is thus ‘habitat’, and is thus entitled to protection under 61/105. Fish gills, providing habitat to parasitic copepods, serve the same function. In the absence of clarity, we have biologists arguing that choosing one particular percentile value as opposed to any others is ‘scientific’, and not simply pick-a number methodology and justifying their case by inevitable reference to these UN resolutions, which they probably were involved in crafting. Surreal! But those familiar with the processes by which governments function, can readily surmise explanations for this lamentable institutional position

What is the Ecosystem in question?

With so many political (and percentile) feints and counter feints it was inevitable that the UN resolution arising from the New York process would be flawed and found ‘not-fit-for-purpose’. While our industry truly welcomed a strong political statement expressing concerns as to the sustainability of the world’s fisheries (indeed much of the resolution repeated long-standing and widely accepted desiderata), the UNGA, unavoidably a political agency to its core, proved unable to stop with providing a prescient and coherent diagnosis of the issues and blundered into attempts to proscribe technical prescriptions to scientific and ecological issues that were, and some remain, poorly defined, if at all, and inevitably complex. Not surprising then that they got it so wrong. This strategic blunder and subsequent tactical implementational errors have dogged this process until this day while providing an ongoing migraine to those in industry. It is an oft-repeated tale of what is good and innovative –what was innovative was not good and what was good was not innovative.

As noted, the 2006 Resolution 61/105 repeats text from the earlier 2004 Resolution 59/25 that (para 80) calls for the protection of “vulnerable marine ecosystems including seamounts, hydrothermal vents and cold water corals from destructive fishing practices ...” from destructive fishing practices. Where to start? Nowhere, then or since, has there been any discussion of what comprises an ‘ecosystem’, especially in our context. It seems to be something that everyone knows what they mean without the need for confirmation with, or affirmation of, others. Dr Google offers “the plants and animals in an area.” Area? The Southwest Pacific? A particular seafloor feature? A single vent? Or even the animals living on a particular branch of a coral attached to the seafloor? Are all to be treated equally? Are they all equal in terms of the Resolution? Who knows? If they do, no one says.

To us, the term *ecosystem* implies structures of tropic levels connected by energy pathways and food dependencies usually with some degree of circularity. But that is scarcely our case. Indeed the animals over which so much effort has been laboured *ad infinitum* as to what should be a correct trawl bycatch trigger level are more correctly called something else. The seabed acts essentially as an energy sink – except perhaps for gametic materials. Organic matter sinks to the sea floor where it accumulates. The fragile benthos growing fixed to the seafloor all depend on the rain of sinking organic material. Filter feeders feed on this detritus, all in a similar manner, i.e. they occupy the same ecological niche. Such a collection of animals is appropriately described as a *guild*. There appears to be no ecological or ecosystem dependency of the animals comprising these benthic

communities and populations. We are dealing with 'vulnerable guilds' – we believe we can dispense with the term 'marine', corals and sponges don't grow on the land.

And what is the appropriate *area* to be considered? This is a critical, but only occasionally considered issue though we do know of some recent and particular heroic efforts at defining expansive biogeographic realms. Should it embrace the entire area where the species of interest are found – perhaps even the Southwest Pacific Ocean? Or perhaps the area where the models predict that the species (or is that guild?) might be found above a certain level of unspecified probability of course (keep it qualitative) or everywhere in a particular depth range? Hardly! So we, along with the continuing labouring over threshold percentiles, etc. must move forward in the absence of any adequate, much less professional clarity to what is intended by the term 'ecosystem'.

What is being 'vulnerable'?

UN resolutions have chosen to use the adjective 'vulnerable' apparently unaware that the word is used in a specific though time-varying manner by the International Union for the Conservation of Nature (IUCN). They use it in reference to a species, analogously to the FAO guidelines referring to rare species being those "whose loss could not be compensated for by similar areas or ecosystems." It seems to us (but we do get confounded!) that it does not mean physical vulnerability but genetic vulnerability and/or ecosystem vulnerability (or as we have pointed out, vulnerability of the guilds) as species. One IUCN³ reference is to a vulnerable species as one "likely to become endangered unless the circumstances threatening its survival and reproduction improve. It is therefore considered to be facing a high risk of extinction"

The FAO Guidelines (Paragraphs 13 – 15) are perhaps more helpful though there may be some here who were present at the COFI meeting who can help us by bringing to our attention if there are species or ecosystems (or whatever) that they believe satisfy this definition or variations upon it. The UNGA, in 2006, went on to invite the FAO to develop standards and criteria for use by States to identify *vulnerable marine ecosystems* (VME's) and *the impacts of fishing on such ecosystems* and at this point it is to the guidelines one must turn. But of course we know there will be impacts from demersal fishing, but what is the impact of the impact? Catastrophic to our civilization? No worse than other impacts visited by our societies on the planet through producing food or providing livelihoods? Or, explicitly not an issue to be addressed by the scientists and technicians involved?

The FAO (2009) Guidelines provide three paragraphs as follows.

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 frame⁴. 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

³ <https://www.clearias.com/iucn-classification-critically-endangered-endangered-and-vulnerable>. The IUCN refers to 'endangered species is a population of organisms which is at risk of becoming extinct because it is either few in numbers, or threatened by changing environmental or predation parameters.' Population ≠ species? Confused?

⁴ Did anyone look out of the window on their way in from the airport?.

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.

We can't decide if this helps. Clearly these are relevant considerations but equally clearly they are a partial, indeed highly circumscribed, description of what we are dealing with. Is it appropriate to deal with the issues of spatial scale? How does scale relate to threshold levels (we believe it does)? Is the ecosystem vulnerable if only a small fraction < 1% is affected, e.g. by fishing? This seems to be our case – one of the reasons we are so pained by the minimal treatment given to this issue. This is particularly pertinent but who has addressed it? Where/how in the SPRFMO treatment is the issue of scale of likely impact addressed (FAO Guidelines Para 47 v)?

Why should an ecosystem with a low density of benthic animals present, i.e. one never likely to result in a trigger threshold level of benthic bycatch when fished, not too be considered a vulnerable marine ecosystem, if not of even greater vulnerability? It is questions like these, unanswered in the emphasis for citing UN resolutions in the rush for research funding for benthic field studies, that leave us profoundly uneasy and unable to go along with the 'group think' that we find has failed to clearly identify the issues. We do stress that we do not criticise the high quality and major contribution of research efforts to better understanding the deep-sea marine biology in this area. But this is just not the issue.

Significant adverse impacts

FAO (2009) provides specific comment in regard to the potential consequences of fishing that affects fragile benthos: perhaps 'destructive fishing' might have been in the minds of those responsible for drafting the texts. FAO (2009) notes:

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; or causes on more than a temporary basis significant loss of species richness, habitat of 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 being affected
- iii. The sensitivity/vulnerability of the ecosystem to the impact
- iv. The ability of an ecosystem to recover from harm, and the rate of such recovery
- v. The extent to which the ecosystem functions may be altered by the impact; and
- vi. The timing and duration of the impact relative to the period in which the species needs the habitat during one or more of its life history stages.

19. Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable time frame. Such time frames should be considered on a case-by-case basis and should be in the order of 5 – 20 years, taking into account the specific features of the populations and ecosystems.

20. In determining whether an impact is temporary both the duration and frequency at which an impact is repeated should be considered. If the interval between the expected disturbances of a habitat is shorter than the recovery time, the impact should be considered more than temporary. In circumstances of limited information, States and RFMO/As should apply the precautionary approach in their determinations regarding the nature and duration of impacts.

While we understand that these paragraphs are good, if not unavoidable 'conference-speak', for fishing operators, unexplained leaps in the logic of the understandings do not put fish on the table and we despair that text that can be operationalized in these paragraphs is characterized by its absence.

Circular definitions are not to be welcomed in any text. *Significant* adverse impact ... cause ... *significant* loss of species richness – is not the latter the former? We have noted that deep-sea benthos is more aptly described not as ecosystems but as guilds, their habitats acting mainly as sinks for organic matter. Paragraph 17 proscribes that impacts should be evaluated collectively in regard to three criteria and presumably against the two assessment standards. Has this been done for the SPRFMO region of the Southwest Pacific Ocean? Any/all reductions in the spawning capability of species by harvesting or destroying benthos will impair its reproductive success!

Paragraph 18 introduces the concept of scale. But we ask, have the efforts at predictive modelling (we know that some have an optimism in this method that we do not share) led, somewhere, anywhere, to aid analysis of ecological scale? Is the consideration of scale related only to the possible distribution of fragile benthos or should it reasonably be required to include the distribution of fishing effort? In our view, clearly it should but we see no evidence that use of threshold measures and their ilk do this. And, given that the majority of fragile benthos is fixed to the seafloor, they don't go anywhere and where they are is where they feed, where they spawn and usually where their nursery area is. So what is the justification for criterion 6? We find in fact that all of the criteria of paragraph 42, while perhaps laudable, have enormous operational challenges.

Paragraph 19 embraces the reality that recovery takes time but ignores essential considerations. When is the recovery of an ecosystem deemed to be achieved? When is it back to its pre-impact climax species composition and structure? When age and size structures and spawning biomasses are back to those that existed in the pristine condition? How can anyone know? Is it even an intelligent, if not feasible, management goal? Our view should be self-evident. Perhaps more importantly, the existence of a sustained fishery implies that any impacts in the area of fishing will be chronic rather than acute. Sustainability here implies that there will never be a return to a situation where the ecosystem can be deemed to be recovered. Not in 5 years, not in 20 years. In this situation, the concept, taken out of the blue in criteria vi, is untenable. Further, threshold values will never be triggered in areas where fishing has been sustained because prior fishing would have scraped the bottom bare(ish). Many conservationists are aware of this reality. Is anything achieved – other than lots of rule books? We note with regret the failure of the New Zealand government to adequately utilise the results of their very expensive benthic research on the Louisville Ridge, vulnerable marine ecosystems of the Louisville Seamount Chain: Voyage report of a survey to evaluate the efficacy of preliminary habitat suitability models.

*The Impacts of Trawling*⁵

The impacts of demersal trawl gear on the seabed ecosystem have been increasingly studied, and the impacts of the potential for sustainability and recovery are slowly becoming better understood. Reported tow duration when fishing for orange roughy around New Zealand is that 60% of tows

⁵ This section draws heavily on the FAO 2018. Global Review of orange roughy (*Hoplostethus atlanticus*), their fisheries, biology and management. FAO Fish. Aquat. Tech. Pap. 622. 131pp.

have duration less than 30 minutes and almost one third, duration of less than 15 minutes. This reflects the fishing of aggregations and fishing on UTFs (underwater topographic features), where it is either unnecessary to fish for longer as large catches can be made from aggregations, or impossible to do so due to the roughness of the ground, or because the tow would be too deep when UTFs are fished (orange roughy tend to occur mostly around the top and flanks of UTFs and the trawls usually proceed down the flanks - never up). The amount of gear contact when fishing on UTFs is also less than when towing on flatter ground as the doors tend to be off the seabed as are the majority of the sweeps and bridles (when used). With less gear in contact with the seabed when fishing on UTFs, both direct and indirect impacts will be proportionately reduced.

The scale of the benthic impact is related to the scale and extent of the fisheries. More than half of the historic fishing footprint in the western SPRFMO Convention Area is no longer fished.

The scale of the issue must also be considered with respect to the area of unfished seabed that exists as a result of (i) specific management actions (e.g. MPAs, marine reserves and other closed areas), (ii) natural limitations of trawl fishing (areas too deep, too rough, or too steep to trawl and areas where orange roughy do not occur), and (iii) the interaction between the patchy distribution of both fishing effort and benthic fauna of interest: each of these factors will provide areas that are unfished or where fishing does little or no damage to benthic species of conservation interest. For example, Clark *et al.* (2010) report dense stony corals occurring down a spur on a heavily-fished UTF, but commercial records and information provided by vessel skippers indicated that spur had never actually been fished. Corals and other vulnerable marine indicator taxa have also been observed on heavily fished seamounts in the SPRFMO Convention Area.

Where estimates have been made, the size of the footprint of orange roughy fisheries within areas of fished habitat are extremely small. In SPRFMO, Penney (*et al.* 2016) note that over 99% of the total area is outside of any declared bottom fishing footprint and as such is closed to fishing ()

In some areas the scale of the potential impact as measured by overlap between the fishery and defined habitat can be greater on specific habitat types. In New Zealand waters, up to 80% of knolls and hills with summit depths between 600 m and 1200 m are reported to have been fished. It is also known, however, that on many of these hills and knolls, fishing has been restricted to fishable areas and to areas that hold fish, leaving considerable areas unaffected, or only lightly impacted during the exploratory phase of the fishery. The average percentage of such unfished or closed UTFs in New Zealand's EEZ has been estimated at 68%.

For most orange roughy fisheries, the scale of interaction between the fishery and the benthic environment has therefore been estimated to be small to very small, and even when cumulative overlap between the fisheries and defined habitat across fisheries are considered, it is not sufficiently large to raise concerns about serious or irreversible impacts. For example, it has been reported that *"in the 5 years to 2014, the maximum amount of structural damage to UTF habitats within the orange roughy distribution range that could be attributed to orange roughy fishing in the UoC areas is 13%, assuming 100% habitat destruction of habitat on the fished UTFs in the Unit of Certification areas."* The accumulated evidence suggests that, overall, the associated risk of an adverse impact on the structure or function the benthic ecosystem will be relatively low.

It is important to note that recovery is not a requirement for sustainability provided that the balance between any spatial management (open and closed) areas protects an adequate proportion of the

habitat and that the distribution of the protection is also appropriate (i.e. representative of habitat distribution rather than being confined to one area).

What to do about Biodiversity

The term 'biodiversity' exercises our mind. It is evidently a term that needs evaluation –though everyone seems to agree as to what it means – but do they? Dr Google provides us with many options:

- The variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.
- The variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.
- Biodiversity boosts ecosystem productivity where each species, no matter how small, all have an important role to play. Greater species diversity ensures **natural** sustainability for all life forms
- Biodiversity refers to the amount of diversity between different plants, animals and other species in a given habitat at a particular time. The different varieties and types of animals and plants that live in the ocean is an example of biodiversity.
- **Biodiversity** is referred to as the web of life because many microorganisms, plants and animals interact with each other. The relationship among **species** is an important part of biodiversity (CBD).

Notwithstanding this non-selective set of definitions, in our case, the choice of the number of species in the fragile benthic trawl bycatch used to indicate that the biodiversity marker flag is to be thrown down is three. Why three? Well usually it is zero - 88.2% of tows; one species occurs in 7.7% of tows; two species in 2.7% of tow; three species in 0.9% of tows; four species in 0.4% of tows; 5 species in 0.1% of tows. Higher numbers fall off the scale (the maximum once recorded was seven. Based on this research, worker(s?) employed by NIWA, contracted to supply scientific services to the New Zealand government concluded that biodiversity was encountered if three fragile species of benthos species were present in the trawl bycatch. Less than three would not trip the biodiversity indicator. What codswallop! By first principles (see above), biodiversity exists when living matter is present – it may be low, it may be high. Whatever it is in an area is what it is. The fact that different species can occur in the trawl bycatch ineluctably means that simply by random sampling processes there will be tows with higher and lower number of species present. The results obtained by NIWA clearly show this.

Any instance of a fishing vessel being forced to change its fishing operations on the high seas, especially where this often requires a steam to a distant alternate fishing ground is to be avoided. But our concern here is what this reasoning says about the science being used in the process. We find it highly contentious.

How did this process become so bogged down in analyses of trawl bycatch of benthic species and trigger levels?

It seems an enormous and costly effort has been made on the assumption that looking into the runes of cumulative counts of the catches of fragile benthic species, individually and cumulatively, will provide a 'scientific' basis for indicating when a vulnerable marine ecosystem has been encountered. While some may allege this represents a 'scientific' process we say it is nonsense. But equally we have proven to ourselves the impossibility of changing the system from the outside. There is, and has been for some time alternative and feasible methods of addressing how to ensure the sustainability of fragile benthic populations and communities, but not every single fragile benthic

population or community. We are incredulous, given the amount of money that has been thrown at this problem that essentially no effort has been made to tackle the problem to be addressed purely in terms of areas closed to fishing where (a) there is no interest by the fishing industry in operating, (b) prior fishing by the industry will have extensively modified the nature of the benthos and (c) it is known that the biodiversity and density of benthos is low and/or the bottom habitat is inimical to habitation by fragile benthos or (d) the area of is particular ecological and conservation concern and should be a benthic protected area. Would this be called a cost-effective solution? We think it needs independent consideration.

What has been the role of New Zealand? What has been the role of New Zealand Institutions?

Understanding how societies, individually and collectively function is neither a linear nor transparent process. The New Zealand position in relation to conservation of deep-sea benthos has in our view, been strongly driven by single-issue myopic lobbyists whose positions appealed to the governments of the time. Those in our relevant bureaucracies were instructed to deliver policies and protocols that reflected this (we understand the reasons for this obligation). These same people were major players in the UNGA process and went on to directly contribute to the drafting of the FAO Guidelines and then CMMs at SPRFMO.

It is important to note that the contribution of the FAO was to act as a secretariat, i.e., it organized meetings, turned the lights off when meetings were over and published the results. By, and in, 2006, FAO, though a UN technical agency, contributed little if anything to the scientific/ technical nature of the debates and their outcome, primarily circulating and printing reports, a process handled by their policy and planning division.

In New Zealand, the mandate to undertake research on deep-sea benthos has generally ended up with a government-owned company, the National Institute of Water and Atmospheric Research (NIWA). Among their many, undeniably laudable requirements is to maintain financial viability⁶. Understandably, funding is important for programmes, for employees and for their careers. This of course is normal and it is normal that this will influence the perception of the nature of problems and how to address them. Seen through the eyes of scientists, one expects perceptions to be filtered through one's employment responsibilities.

Can we sum up our view of this history?

Although it is not usually unequivocally expressed, the implicit view seems to be that the loss of *any* benthos is a concern that procedures must mitigate against. To those in the food industry this is naïve. No one has problems with sustainable agriculture. In our country – New Zealand – high tussock ecosystems are proving to be vulnerable to conversion to dairy farming (sorry about the contribution to global warming from cow farts); much wet lands were long ago drained for livestock farming. Across the Tasman Sea tropical forests have disappeared to allow sugar cane farming. But of course, the absence of the 'magic and mystery of the deep' means that funding will not be raised as a consequence for lobbyists that assert that fishing should not endanger any wildlife, in this case deep-sea benthos.

How do we move forward and what we think needs to be done?

Multimillion dollar deep-sea research cruises by NIWA, justified by quietly forgotten media excesses, that fail to achieve objectives of questionable need, no matter the associated media spin underline the need for a complete rethink of how New Zealand has and is, addressing the issue of balancing the costs and benefits of its deep-sea fishing activities. It is essential that this review and audit be

⁶ Median annual income in New Zealand is \$NZ51 840; median income at NIWA is \$NZ115 000. The CEO of NIWA is paid \$NZ 630 000.

undertaken by those who are independent of past efforts by the government and thus are free of the normal (and human) need of government departments to defend past programmes and policies.

Benthic biologists are relevant to this task, but what they do is not *the task*. No matter the views of lobbyists (and that includes us!) a balanced review must recognize why providing food is important to our society; why livelihoods matter; and the role in creating wealth through the fisheries. And, these objectives must be done in a way that conserves the world's natural heritage by fully protecting areas of important biodiversity so that populations and communities are protected while recognizing that the provision of food *will* alter the environment but we must do so in the most rational and least intrusive manner we can devise. The practice of dealing with the minutiae of whether the presence of three species in a trawl once a year indicates a threat to the biodiversity of some area seems to us surreal. It scarcely seems to be a scientific issue.

How best to undertake such a review? We believe that this must be explicitly a top down process driven by policy makers outside the technical agencies that have been involved. Of course incentives play a role in all institutions and it is important to acknowledge this reality when trying to interpret reports and messages that they produce. We note that we do not ask yet again if we want sustainable fisheries or do we want to protect benthic communities – of course we do. Rather, this review must address the issue of what it is to be protected? Every specimen of benthos? Every benthic community or population or ecosystem? They are all vulnerable in the conventional sense but equally it is improbable that our fisheries activities will imperil them. Yes, our fishing will flatten corals and sponges where the trawl foot ropes drag along the sea floor and fragile benthos are present. Burning the Amazon to grow soya so we can eat hamburgers also results in the ecological devastation that is well publicized even if it appears to be accepted. Is there a connection here? We think so.

The global fishing industry, its suppliers of goods and services - the millions of people involved in the fishing industry and support of this industry do support the need to educate the public to what is happening in our fisheries. We have been remiss in not demonstrating that our industry does act responsibly especially given the context that publicity about the high seas is, often correctly, negative. This does not obviate the need for honest accurate analyses and reporting.

Summary

The HSFG have consistently championed policies which are sincerely believed to further the interests of all who have a stake and an interest in deep-sea fisheries. These policies can be expressed succinctly – we do so as follows.

- ***The concept of thresholds*** – arbitrarily- contrived subjective- management parameters whose claim to 'science' is that they are based on an arithmetic process and not completely pulled out of the air. It is widely accepted that the extent to which fragile benthos is retained by a trawl is a matter of happenstance that provides no assurance that benthic communities will be protected through application of this concept.. Well-accepted and better methods of conservation exist – they should be used.
- ***Spatial management*** goes far beyond devising rectangles to place on charts. The HSFG believes that areas known to host communities and populations of fragile benthos should be closed to fishing and such closures will be fully supported by our members. In parallel, areas where this is not the case should be open to fishing. It should be kept in mind that the most effective control on the impacts of fishing is matching the fleet fishing power to the productivity of the fishery resource.

- **The move-on-rule**, when it is mandated in areas where ‘threshold’ amounts of fragile benthos occur in the trawl bycatch is as likely to result in further environmental damage as it is to prevent it. This is another arbitrary management parameter that has no demonstrated relation to the spatial ecology of fragile benthos. It forgoes the opportunity to gain further knowledge that can provide insights into the ecology of the benthic species of concern.
- **Consultation with stakeholders** critically affected by management decisions is both mandated and essential. Such consultation should not be an opportunity to offer ‘the tin ear’, but rather be genuine, well- meant and undertaken in good faith. Experience shows that the absence of effective consultation can be inept and damaging management initiatives that harm all involved.
- **Benefit from those who have relevant experience**. Those involved in the relevant deepwater fisheries have the most experience with the environments in which they work. It is perverse when this experience is not utilized to the maximum. Possessing expertise in this field requires involvement year-in and year-out. This is not obtained by biannual rotation of career positions through different branches of employers. Experience in one branch of fisheries does not imply competence in another. The same principle applies in governance.
- **Using the best available information** is not supposed to be a shibboleth but a mandated requirement. Failure to do so demonstrates culpability, yet it is the industry’s experience that decisions continue to be taken that ignore this ever-repeated desideratum. This results in sub-optimal management decisions at best and damaging risk-prone and cost-incurring outcomes at worst.
- **The world has moved on** since the relevant UNGA resolutions on deep-sea fisheries when they were first mooted. It is essential that those in the relevant branches of government recognize that the understanding of the issues involved has also moved on, not least because of the availability of new hi-tech equipment and development of methodologies such as acoustic-optimal *in situ* deep-sea observation. The time is well past for an effective review of the issues and the solutions.
- **Stakeholders with common interests** must cooperate and collaborate. By embracing such methods of support the global deepwater fishing industry will best contribute to maximizing the social welfare of the communities they embrace.