



**SUMMARY OF THE REYKJAVIK CONFERENCE  
ON RESPONSIBLE FISHERIES IN THE MARINE  
ECOSYSTEM  
1-4 OCTOBER 2001**

The Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem met from 1-4 October 2001 at the University Cinema and Conference Center in Reykjavik, Iceland. The conference was organized by the Government of Iceland and the United Nations Food and Agriculture Organization (FAO), and was co-sponsored by the Government of Norway. The meeting was attended by over 400 participants, including representatives from FAO Member States and other UN Member States, UN bodies and agencies, inter-governmental and nongovernmental organizations, academic and scientific institutions, and industry.

The conference presented stakeholders with an opportunity to gather and review the best available knowledge on marine and ecosystem issues. It sought to establish a means by which ecosystem considerations could be included in capture fisheries management, and to identify future challenges and relevant strategies.

To achieve these objectives, participants met in plenary sessions and a Scientific Symposium, in which invited experts presented their research and views and participants engaged in general discussions and raised questions from the floor. Following an opening Plenary session in which keynote speakers set the stage for the meeting and provided various stakeholders' perspectives, delegates convened for the Scientific Symposium, which took place on Monday and Tuesday, 1-2 October. During the Symposium, participants focused on key scientific issues for ecosystem-based fisheries management (EBFM), including the dynamics of marine ecosystems, the role of people in marine ecosystems, and methods to incorporate ecosystem considerations into fisheries management. They also heard representatives of industry present their perspectives on EBFM. On Wednesday, 3 October, delegates met in Plenary to hear statements from countries, NGOs, intergovernmental organizations and UN agencies.

Following field trips to local fisheries sites on Thursday morning, 4 October, delegates reconvened for a final Plenary in the evening and approved the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem. An open-ended drafting committee established at the start of the conference formulated this Declaration during intensive negotiations. The Declaration will be submitted to the World Summit on Sustainable Development for its consideration.

**A BRIEF HISTORY OF FISHERIES MANAGEMENT**

Overexploitation of the world's marine fisheries is a serious concern. Rapid technological advances and significant increases in the human population during the past half century have resulted in a vast increase in global production of marine capture fisheries, from 19 million tonnes of catch in 1950 to around 80 million tonnes annually since the mid-1980s. As a result of this dramatic increase, about one-quarter of the world's marine fish stocks are now believed to be over-exploited, while approximately half are classified as "fully exploited." Such heavy use of these resources means that key stakeholders must deal with rapid declines in some fish stocks, which are affecting national economies and local communities' socio-economic well-being, and even their food security. Fishing fleets in many regions often have a capacity that exceeds the mature fish stocks available. And although the scientific understanding of marine ecosystems remains limited, there is mounting evidence that the fisheries sector and other human activities are having a serious impact on these ecosystems.

Given these growing problems, experts have been developing new ideas and approaches to complement the conventional fisheries management approach, which considers each fish stock in isolation or several fish species but not the wider marine environment. One concept considered in recent years is how an EBFM approach might contribute to achieving long-term sustainability for the fisheries sector. Although the details of such an approach are still being developed, most experts agree that it should take a more holistic and integrative view of fisheries management. An EBFM approach should also emphasize strong stakeholder participation and focus on human behavior as the central management dimension. In this context, a number of organizations, institutions and government agencies have been working on the pressing question of how to include ecosystem considerations in capture fisheries management practices and procedures.

**REPORT OF THE CONFERENCE**

The Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem opened on Monday morning, 1 October 2001. Delegates welcomed Iceland's President, Ólafur Ragnar Grímsson, to the opening of the meeting. They then elected Iceland's Minister of Fisheries, Árni Mathiesen, to serve as Chair of the Conference. Chair Mathiesen thanked delegates for entrusting him with this important task and introduced the opening speakers.

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### OPENING SPEECHES

Jacques Diouf, Director-General of the UN Food and Agriculture Organization (FAO), emphasized the conference's aim of strengthening global efforts to ensure the effective and sustainable use of marine resources and the sound management of the ecosystem. Highlighting the problem of food insecurity, he noted that almost 800 million people are suffering due to a lack of food, including 300 million children. He drew attention to the pledge made at the 1996 World Food Summit to halve the number of people living in hunger by 2015, and said capture fisheries and their management can play an important role in honoring this pledge. Noting that previous perceptions that the oceans can provide an inexhaustible supply of food have been proven wrong, he supported action to adopt effective fisheries management systems, and highlighted several recent international treaties and instruments that support such action. He referred to this conference as a "stepping stone" towards achieving consensus on the responsible use of the marine ecosystem, and said he looked forward to its guidance on how to improve the management of ocean capture fisheries.

Otto Gregussen, Minister of Fisheries of Norway, highlighted the dependence of Norway and other countries on the sustainable harvesting of marine resources. Commenting that this conference was timely, he said action is needed at both national and global levels to address the pressures on these resources. He expressed the hope that delegates could "break new ground" by agreeing on the elements of an ecosystem-based fisheries management (EBFM) approach, including steps that should be taken at the national, regional and international levels. He also called on delegates to identify the roles of key stakeholders and to work towards a common understanding on the need to assist developing countries in capacity building.

Halldór Ásgrímsson, Minister for Foreign Affairs of Iceland, noted his country's reliance on fisheries for its livelihood and for export earnings. Drawing attention to global concerns about overfishing and the state of fish stocks, he warned against overly simplifying fisheries-related problems, noting that some countries already manage their fisheries sustainably. While supporting a major role for international forums and organizations in contributing to fish stocks management, he cautioned against international micro-management of local economies. He suggested that although some industrialized countries pressing for a more active international role have overexploited their own stocks or have an overcapacity in their fishing fleets, these countries' difficulties should not be exported to countries that are managing their fisheries effectively.

Minister Ásgrímsson supported a role for the international community in sharing scientific knowledge and experiences, and in making the global market conducive to sustainable fisheries through supportive international trade rules and by addressing the tariffs and subsidies that harm developing countries. He also called for increasing international support for effective management of fisheries resources by developing countries, particularly in small island developing states that are heavily dependent on fishing. Observing that this was the only fisheries-related FAO conference prior to the 2002 World Summit on Sustainable Development in Johannesburg, he urged that a strong statement on sustainable fisheries be delivered from this meeting to the Summit.

Conference Chair Mathiesen highlighted the growing realization that fisheries management should be based on a broader ecosystem approach, rather than on a stock-by-stock basis. Noting that participants would hear various perspectives on the EBFM approach, he said he would seek agreement on principles for this approach, as well as steps that could be taken at the national, regional and international levels.

### ORGANIZATIONAL MATTERS

Following the opening speeches, delegates took-up various organizational matters. Chair Mathiesen indicated that an open-ended drafting committee for FAO Member States would be held concurrently with the conference with the aim of producing a Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem, and expressed the hope that the conference would mark an important milestone in the management of marine resources. Delegates elected Abraham Iyambo, Minister of Fisheries and Marine Resources of Namibia, as Chair of the drafting committee. They then adopted the agenda for the meeting.

In addition to the appointment of the Conference Chair at the opening of the conference, six Vice-Chairs were also elected: Amar Ghoul (Algeria), Helia Sandra Morgado Da Silva (Angola), David Bevan (Canada), Mara Murillo (Mexico), John Annala (New Zealand), and Ngoc Ta Quang (Viet Nam).

### FIRST PLENARY SESSION – SETTING THE STAGE

Following the opening speeches and adoption of the agenda, delegates heard five presentations aimed at setting the stage for the conference by establishing a common understanding of EBFM. Speakers offered overviews on the state of marine capture fisheries and their ecosystems and on the obligations to protect marine ecosystems under existing international conventions and other legal instruments. Representatives of the environmental community and of large-scale and small-scale fisheries also presented perspectives on EBFM.

Serge Garcia, Director of the FAO's Fishery Resources Division, presented a global overview of marine capture fisheries. He said the sustainability of the current fisheries system is being examined in light of the serious concerns about overexploitation of fisheries resources. He drew attention to an increase in reported global production of marine capture fisheries from 19 million tonnes in 1950 to over 80 million tonnes today. Observing that this amount has remained relatively unchanged during the past decade, he suggested that achievable limits for marine fisheries catch have now been reached. He also identified regional differences in fishery resources, citing a recent FAO assessment that found around half of the world's fisheries resources to be "fully exploited," one-quarter overexploited, and the remaining quarter apparently able to support higher rates of exploitation.

Serge Garcia stated that fisheries face several significant challenges, including: overfishing, which results in a collapse in marine resources and an increase in endangered species; fishing fleet overcapacity, which is connected to the use of subsidies; and environmental impacts. In spite of an improvement in fisheries management through a range of global, regional and national initiatives, he noted problems in effective enforcement of management measures and the need for improved governance. Supporting the need to improve the quality of data to better assess fisheries management, he also suggested that the available information points to a definite increase in overfishing internationally. He concluded by highlighting the value of shifting to an EBFM approach, adding that the status quo is "not an option" if sustainable fishing is to be achieved.

William Edison, Senior Legal Officer, FAO, delivered a presentation on behalf of Transform Aqorau, Legal Counsel of the South Pacific Forum Fisheries Agency, on the obligations to protect marine ecosystems under international conventions and other legal instruments. He listed a number of conventions and instruments that impose obligations for management activities regulating use of the oceans, noting that not all are binding or have entered into force. He highlighted the 1982 UN Convention on the Law of the Sea (UNCLOS) and the 1992 Convention on Biological Diversity as major agreements for marine fisheries. Another relevant treaty is the 1995 UN Fish Stocks Agreement, which refers explicitly to the ecosystem approach, but has yet to enter into

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### SCIENTIFIC SYMPOSIUM

force. Edison also discussed the voluntary 1995 FAO Code of Conduct for Responsible Fisheries, which provides a comprehensive, multi-stakeholder instrument on fisheries management. While international instruments rightly seek to establish a global framework for EBFM, Edison drew attention to a number of weaknesses, including the fact that many States are not party to these instruments, thus limiting their application. In addition, provisions in these instruments are often ambiguous or unclear on environmental protection, and many countries are unable to provide the resources to implement the measures outlined in these instruments.

Bernt Bodal, Chair and CEO of American Seafoods Group, presented a large-scale industry perspective on incorporating ecosystem considerations in fisheries management. He underscored the importance of economies of scale in providing cost effective food-sources. Focusing on the success of the large-scale fishing industry in the US North Pacific, he noted that nearly 30 years of commercial fishing has not caused overfishing of the 63 species of groundfish in the area, and attributed this achievement to the industry's application of the precautionary principle in calculating quotas and to its close monitoring of harvests. He expressed a willingness on the part of large-scale industry to support research and blamed poor governance where fisheries have collapsed. He highlighted the superiority of harvesting cooperatives as a means of managing large-scale fisheries. These cooperatives voluntarily assign quotas and thus increase the accountability of individual companies, unlike the more commonly practiced "Olympic-style" commercial fishing, where vessels compete against each other for catch.

Sebastian Mathew, Executive Secretary of the International Collective in Support of Fishworkers, presented a small-scale fisheries perspective on an EBFM approach, particularly from a developing country's perspective. Highlighting the fishery sector's role in employing and feeding people and in alleviating poverty, he characterized small-scale, artisanal fisheries as traditionally non-mechanized and highly diverse, and expressed concerns that increased motorization of artisanal fisheries is expanding fishing capacity and creating overfishing pressures in coastal communities. In this respect, he stressed the need to focus on small-scale fisheries in marine resource management, noting that current institutional mechanisms are inadequate and that governments lack the confidence to invest in small-scale fisheries management regimes. He called for new initiatives in small-scale fisheries management, urging industrialized nations to stop using their excess fishing capacity in other regions and suggesting that they facilitate a temporary migration of the surplus labor force from areas in the South that have an overcapacity of fisheries workers to those in the North with labor shortages.

Tundi Agardy, Executive Director of Sound Seas, presented an environmentalist's perspective on responsible fisheries. She indicated that environmentalists' aims include synthesizing and disseminating information, promoting the precautionary principle, shifting the burden of proof in determining impacts of new or emerging fisheries from NGOs to the fishing industry, and removing disincentives to conservation. In efforts to achieve these objectives, she advocated a holistic approach recognizing the interconnections between: target stocks and ecosystems; fish harvests and the production chain, particularly the need to recognize the impacts of distribution and packaging in certification schemes; and the relationship between humans and the natural world. She also recommended the creation of marine protected areas (MPAs), noting their ability to integrate development and conservation objectives.

The Scientific Symposium was held on Monday and Tuesday, 1-2 October. The Symposium addressed some of the scientific issues that are central to EBFM. During the Symposium, participants met in three sessions that examined: the dynamics of marine ecosystems; the role of people in the ecosystem, including their multiple uses of and impact on marine ecosystems; and issues of governance and the challenges of incorporating ecosystem considerations in fisheries management. Abstracts and full texts of the Symposium papers can be found at [ftp://ftp.fao.org/fi/document/reykjavik/default.htm](http://ftp.fao.org/fi/document/reykjavik/default.htm). Participants also convened in a session to hear and discuss industry perspectives on these issues. The Symposium was co-chaired by Michael Sinclair of the Bedford Institute of Oceanography in Canada and Johann Sigurjónsson of Iceland's Marine Fisheries Institute.

**DYNAMICS OF MARINE ECOSYSTEMS:** Symposium Co-Chair Michael Sinclair introduced this session on Monday afternoon. Noting the challenges of increasing fish stock levels and incorporating broader ecosystem issues into fisheries management, he raised the question: how do we move from our present management systems to an EBFM approach? He said the Symposium would provide the scientific context for making this transition and introduced the speakers for the session.

**Presentations:** Daniel Pauly, Professor at the University of British Columbia's Fisheries Center, examined ecological geography as a framework for a transition toward responsible fishing. He highlighted the use of maps as devices to reflect some of the many dimensions of the fisheries in complex marine ecosystems. Using biomass and catch maps, he highlighted concerns about a steep decline in predatory fish biomass in the North Atlantic. He also suggested that, contrary to the widely-held view that fish supply per person has held relatively constant during the past decade, global marine catch has in fact been declining, although the decline had been masked by over-reporting on catches from China and of Peruvian anchoveta.

In his presentation, Philippe Cury, IRD Research Associate at the University of Cape Town, considered the functioning of the marine ecosystem. He drew attention to evidence that environmental variability significantly influences and controls the abundance and distribution of marine populations, and that fisheries affect the way ecosystems function. He considered the question of what controls marine ecosystems and examined three possible types of energy flow: bottom-up controls, in which primary producers play the dominant role in determining the abundance of the various marine populations, while removal of large predators does not have a significant impact on other species; top-down control, in which predators have the greatest impact; and "wasp-waist" control, in which the state of the dominant species – small pelagic "prey" fishes – controls the abundance of predators and primary producers.

Although the question of who is controlling whom in marine food webs is still being evaluated, and no general theory can be applied to marine ecosystem functioning, Cury drew the tentative conclusion that bottom-up control is predominant in most areas. Noting the complexity of the marine ecosystem, he said major steps are urgently needed to define an ecological framework for dealing with responsible fisheries in marine ecosystems. He encouraged comparative studies between marine ecosystems to support the development of new generalizations, as well as the need to define new indicators to help assess the impact of fisheries on ecosystems. This in turn would assist in developing a new framework for fisheries management.

Andrew Trites, Director of the Marine Mammal Unit at the University of British Columbia, described general patterns in marine food webs and explained that information on the diets of marine organisms

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was compiled through stomach and scat sampling and fatty acid and stable isotopic analysis, through examining contents of blubber, tusks and bones. In highlighting the complexity of food web studies, he illustrated the example of declining Steller sea lion populations in the Bering Sea, observing that the situation was more complex than commercial fishing simply having decreased the sea lions' food sources. He noted that environmental changes might have brought about population shifts in different fish species in the Bering Sea, which possibly caused a change in the diet of Steller sea lions from fatty pelagic fish in the 1950s to benthic fish with lower fat content in the 1990s. This lower quality of food is seen to be a factor in Steller sea lion decline in that region.

In his presentation, Tsutomu Tamura, a research scientist with the Institute of Cetacean Research in Japan, focused on the competition for fish between cetaceans and commercial fisheries. In illustrating cetacean dietary habits, he noted that in the North Pacific, North Atlantic and southern hemisphere, cetaceans consumed three to five times more fish than the worldwide marine fishery catch. Tsutomu provided examples of direct and indirect competition for fish between cetaceans and the fisheries industry, highlighting the competition between minke whales and fishing fleets for Pacific saury. He concluded by stressing the need for more data of stomach contents in cetaceans and arguing that, to promote a realistic approach to fisheries management, multi-species management that includes cetaceans should be developed.

Gunnar Stefansson, a researcher with the Marine Research Institute in Iceland, described the attributes and limitations of existing ecological models. He noted the great uncertainty involved in using models, and advised a precautionary approach. In describing current fish stock control mechanisms, he mentioned the benefits and challenges of using closed areas and total allowable catch (TAC), and of regulating fishing effort and mesh sizes, noting that no one solution would suffice, and that the problem of overcapacity affected all these control systems and needed to be included as a factor in models. Stefansson pointed out that the real problem was one of fleet size and criticized the failure to address this problem. He challenged the current perspective on managing marine resources and supported harvesting marine resources using the smallest fleet size possible at a minimum level of fishing mortality that does not lead to serious long-term catch loss.

**Discussion:** In the subsequent discussion, one participant asked whether the three control systems outlined by Philippe Cury reflected the real-life complexity of the situation, suggesting that in-depth data were needed on specific ecosystems. Cury said it was important to try and trace some patterns that can be applied and tested in the light of actual case studies. Responding to a question on whether marine systems are relatively resilient, Cury cautioned that they may not be as resilient as had been previously imagined.

One delegate underscored Daniel Pauly's findings that massive overfishing and vast removals of biomass has taken place. Reacting to another participant's comment on the need to focus on reducing fishing, Pauly agreed, indicating that there had been a dramatic reduction in biomass even in recent years. In response to a comment on fisheries problems in the southern hemisphere, Pauly said the problems of overfishing driven by overcapacity are the same in both hemispheres, and politicians in all regions seem equally unable to deal with the problem. He suggested that small-scale fisheries are often more economically efficient and environmentally sustainable.

One delegate questioned a proposal for more models, suggesting that this would be less useful than having simpler models, and stressing the more urgent need to address the immediate problem of fishing overcapacity. Responding to a question on the impact of the removal of marine mammals on fish stocks, Tsutomu Tamura noted the need for more specific data on fish species consumption by marine mammals.

**THE ROLE OF MAN IN MARINE ECOSYSTEMS:** Participants considered the role of man in marine ecosystems on Monday afternoon, 1 October and Tuesday morning, 2 October in sessions chaired by Johann Sigurjónsson, who introduced the issue and the keynote speakers.

**Presentations:** Andrew Rosenberg, Dean of Life Sciences and Agriculture at the University of New Hampshire, gave an overview of the multiple sources of impacts on fisheries and described three classes of impacts: direct, indirect and complex. Direct impacts, which affect fish mortality rates, are caused by activities such as exploitation, conservation, toxic pollution and fishing, which has the largest direct effect on fish populations. Indirect impacts, which affect growth and reproductive rates, are induced by habitat loss, new competition for resources, chronic contamination and disturbance. Complex effects, which entail multiple, interactive factors, could be caused by any combination of high exploitation rates and habitat loss, acute and chronic toxic effects. Rosenberg illustrated the spatial and temporal variations in all levels of effects, noting that generally near-shore ecosystems experienced greater impacts than off-shore habitats, and that direct effects tended to be acute, short-term and less complex, while indirect effects tended to be long-term and highly complex.

Michel Kaiser, Senior Lecturer on Marine Benthic Ecology at the University of Wales, explored the ecological significance of fishing on marine benthic environments. He mentioned that some disturbances can cause an increase in biodiversity, but that the ecological impact of towed bottom fishing gear has not yet been determined. He explained that disturbing the benthic environment generally causes a species reduction in the short term, but noted that what was more critical was the capacity of the system to recover, and illustrated the great variation in recovery times of different benthic environments. Kaiser highlighted the possibility of incorporating both fisheries and habitat conservation aims, using the example of how restricted fishing in the North Atlantic resulted in increased scallop populations. He concluded by advocating a combination of several approaches to fisheries management, including restricting towed bottom fishing gears and introducing seasonal or rotational closures of fishing areas.

Robin Cook, Marine Fisheries Advisor at FRS Marine Laboratory, examined the magnitude and impact of by-catch mortality by fishing gear. Noting that most fisheries operations trap organisms that are not their primary target, he said such by-catch includes non-intended catch that may still have economic value, and also species that have no value and are discarded. He said discarded catch was a major problem representing about a quarter of the total world catch. He also noted that for most species, the survival rate among discarded catch is very low, adding that some by-catch species are currently threatened or endangered. He suggested that, while it is not deliberate, regulations such as minimum landing sizes and catch restrictions can actually encourage discarding. Identifying solutions to the by-catch problem, he said technical conservation measures such as modified fishing gear and practices can reduce by-catch, adding that the short-term economic costs associated with such changes would need to be addressed for such measures to be successfully introduced and implemented. Preventing fishing in areas where juvenile fish are concentrated is another option. However, he stressed that by-catch is just one factor affecting the total mortality of species that are affected by fishing, meaning that the broader problem of excessive exploitation needs to be tackled.

Ellen Kenchington, Research Scientist with the Bedford Institute of Oceanography, considered how fishing affects marine genetic resources at three levels: species, population and within populations. She emphasized that because marine genetic resources are not yet well understood and because genetic loss is irreversible, precaution is critical. In addition to showing that fishing directly removes genetic resources at the

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fish species and population levels, she also illustrated how it indirectly affects other species, citing the potential extinction of Hector's dolphin populations by fishing gear entanglement. She stressed that considering population size alone was not sufficient to ensure species fitness or "robustness," emphasizing the importance of maintaining variability of genetic material within populations, and noting that fishing, which often selects for size, sex and time of spawning, has been proven to cause heritable differences in life history traits within fish populations.

Henrik Gislason, a Fisheries Biology Professor at the University of Copenhagen, elaborated on how fishing affects marine ecosystems through changing species interactions, altering marine habitats, adding discards to the marine food web, and reducing abundance of slow-growing, late-maturing species. He showed how overfishing of capelin in the Barents Sea affected population characteristics of their natural predators, cod and herring. Using examples from Northwestern Australia and the Caribbean, he demonstrated how trawling directly impacts species richness and how heavy fishing indirectly causes a decline in coral reefs. As a further example, he cited evidence that discards increased scavenger seabird populations in the North Sea. Gislason concluded that marine ecosystems differed in their responses to fishing, noting that the most sensitive systems were ones where energy flowed through a few key species, or where biota provided structural habitats, as is the case with coral reefs.

Katherine Richardson, Professor at the Department of Marine Ecology, University of Aarhus, described how anthropogenically-induced changes in the environment affect fisheries. She examined various non-fishing human activities affecting fish and fisheries, including: land-use change; the introduction of non-indigenous species; conservation measures for other species, such as fish predators, that interact with fish; other human uses of the ocean, including oil extraction; and nutrients and contaminants introduced by humans that affect fish. Stating that freshwater fisheries are more obviously impacted by human-induced changes to aquatic environments, she noted that humans also clearly influence marine environments, including fish stocks. Although these influences are difficult to quantify, both biologically and economically, she suggested that efforts to establish "responsible fisheries" are likely to imply less fishing in some areas. Richardson also highlighted growing concerns about chemical contamination of fish and the marine ecosystem, and supported further research on this matter.

**Discussion:** During the ensuing discussion, several participants raised issues relating to by-catch and discards. One delegate drew attention to work in the US on reducing by-catch associated with shrimp fisheries. Responding to a suggestion that shrimp fisheries by-catch could be addressed through closed areas and monitoring, Andrew Rosenberg agreed that such systems can work if the right incentives are provided. He said incentives should be built into management programmes. In this regard, another participant drew attention to incentives established for a by-catch limit in the North Pacific.

Replying to a participant's comment about different perceptions guiding policy making for marine as compared to terrestrial areas, Katherine Richardson agreed, noting that land is segregated for agricultural, conservation and other uses, with consequent implications for species in those areas. She said this does not happen in the same way for oceans, although she suggested that "we're getting close" to the stage where marine area enclosure or protection might become common, while fishing continues in other areas. Andrew Rosenberg said one reason for this different approach is that marine areas are considered in terms of populations and ecosystems, while terrestrial systems are thought of in spatial terms.

In response to a comment on the need to consider recreational fishing activities, which can have significant impacts, such as by-catch problems, Rosenberg agreed that all fishing had an impact on fish species, and said recreational activities were not excluded from these discussions.

**INCORPORATING ECOSYSTEM CONSIDERATIONS IN FISHERIES MANAGEMENT:** On Tuesday afternoon, 2 October, participants heard presentations and engaged in discussions on incorporating ecosystem considerations in fisheries management.

**Presentations:** Jon Sutinen, Professor of Economics at the University of Rhode Island, elaborated on the performance of different fisheries management systems in the context of the ecological challenge. Drawing from an extensive study by the Organization for Economic Cooperation and Development (OECD), he explained how most common control measures, such as TAC, limited licenses, area closures and controls on fish size and sex, were found to be ineffective in ensuring conservation. He said only Individual Fishing Quotas (IFQs), which are rights-based and provide incentives to mitigate the competitive "race-to-fish" between companies, have been found to be a potent and valuable tool for fisheries management. In this regard, he cited the community harvesting cooperatives in the US and Canada as successful examples of the IFQ approach. Sutinen emphasized that the real problem in fisheries management lies primarily in its governance structure and in the alliance of short-term interests between elected officials and fishermen and the fishing industry. He questioned the effectiveness of EBFM in improving the fisheries situation if nothing was done to improve fisheries governance. He concluded by advocating careful planning in applying ecosystem-based approaches.

Douglas Butterworth, Professor in Mathematics and Applied Mathematics at the University of Cape Town, described how the Operational Management Procedure (OMP) can successfully unify harvest control laws, risk, uncertainty, and the precautionary principle in fisheries management. He explained that the OMP, unlike traditional fisheries management approaches, takes explicit account of scientific uncertainties, applies the precautionary principle and performs comprehensive simulation testing to derive TACs, and also shows decision-makers the trade-off between catch levels and the risk of resource depletion. In outlining applications of OMP in multi-species scenarios, he explained that OMP has been successfully used in operational (by-catch) interactions, as demonstrated in its ability to calculate company trade-offs between annual catches of sardines and anchovies in South Africa. However, it has not been successfully applied in biological interactions, such as competition and predator-prey relationships, due to a lack of data and understanding in predation and competition interactions.

John Willy Valdemarsen, Chief of FAO's Fishing Technology Service, examined how modifying fishing gear can achieve ecosystem objectives. He outlined examples of gear modifications that have reduced unwanted by-catch, including the turtle excluder device for shrimp trawls, the Nordmøre grid for separating shrimp and fish, modified tuna purse seines to reduce dolphin mortality, and a bird-scaring line to limit seabird capture during longline fishing. He then reviewed the development of gears and practices to reduce the impact of fishing on benthic communities and their habitats. In spite of these innovations, he said it was unlikely that gear modifications will eliminate all adverse impacts, and outlined a combination of measures, including avoidance of specified areas, technological improvement, and other management actions. He cautioned that gear modifications and techniques that increase costs and reduce catch and earnings will not be accepted by the fishing community, but said recent experiences suggest that modifications reducing the impact on non-target species and habitats can be



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implemented without significantly damaging fishing industry profits. He said economic rewards should be offered for the creation of new types of gear and modifications.

In his presentation, Keith Sainsbury, Senior Principle Research Scientist at the Commonwealth Scientific and Industrial Research Organization (CSIRO), spoke about incorporating ecosystem objectives into management of sustainable marine fisheries, including using "best practice" reference points and MPAs. Noting the broadening of fisheries management to include a range of high-level ecosystem-related objectives and considerations, he outlined three steps to incorporate such objectives into marine fisheries management systems at an operational level: reporting and assessing the whole management system, rather than just individual parts; using reference points, indicators and performance measures for ecosystem objectives; and making better use of management tools that are inherently precautionary, such as MPAs. He suggested that the use of reference points represents a possible "best practice" in operationalizing ecosystem goals.

In his presentation, Michael Sissenwine, Director of the Northeast Fisheries Science Center at Woods Hole, outlined an ecosystem approach to governance for responsible fisheries. Outlining six key elements to such an approach, he noted that sustainability is an important element in achieving responsible fisheries. Among the key elements presented were that EBFM should define clear goals and constraints, be precautionary, protect the ecosystem, have a participatory and transparent decision-making process, and have management support that includes scientific information, compliance and enforcement. He remarked that conventional single-species management is critical in ecosystem protection and that it is its implementation, rather than the conventional approach itself, that has failed. He stressed the need to replace the "race-for-fish" with rights-based allocation, and in examining how to determine the basis of these rights, noted that the sum of all allocations must not result in overfishing. Sissenwine concluded by expressing concern that scientists are less likely to take professional risks in making strong recommendations given the growing atmosphere of public scrutiny, criticism and potential litigation.

**Discussion:** During the ensuing discussion, several participants raised issues relating to Individual Fishing Quotas (IFQs). In response to a question on whether quota transferability made a difference to IFQs, Jon Sutinen said it makes a difference because it can generate further profits, but that non-transferable IFQs also perform well. One participant expressed concern that the FAO, World Bank and a number of scientists have been promulgating the use of IFQs. He indicated that his own research finds that IFQs are not precautionary, that they focus on a single species, are irreversible and socially inequitable. Sutinen responded that evidence demonstrates that IFQs work better than other alternatives, adding that the OECD study does address some of the problems of IFQs. He suggested that IFQs can always be discontinued through setting the TAC at zero and shutting down a fishery. Another delegate noted that the FAO's official position was that it advocated rights-based systems in general, which included IFQs, but that did not mean they were the only option.

In response to a question regarding what happens to OMP when the system deviates from the model's predictions, Douglas Butterworth noted that in an ideal world we would find one permanent formula, and asserted that OMP's automated process saved time and gave a better long-term focus than traditional approaches. Keith Sainsbury reminded participants that models are not meant to predict the future, but to produce robust strategies that deal with complex situations.

One delegate observed that while one presenter had advocated fleet reduction, another had supported modifying fishing gear, and asked for further perspectives on whether policy makers would be best advised to

adopt one policy over the other. Michael Sissenwine recommended using both approaches, as the different measures tackle separate issues of by-catch and overcapacity.

**INDUSTRY PERSPECTIVES:** On Tuesday afternoon, participants heard presentations and engaged in discussions on industry perspectives on fisheries management and ecosystem considerations. Opening the session, Symposium Co-Chair Johann Sigurjónsson presented four questions for industry speakers to consider in making their presentations: how will industry react to increasing demands regarding sensible use of marine resources; how does industry see ecosystem based management being implemented; should industry be more visible in the debate about resource management; and how can industry become more involved?

**Presentations:** Michael O'Connor, High Liner Foods Inc., outlined his company's current situation and practices, noting an eightfold decline in fleet capacity since the late 1980s, and attributing this reduction to Canada's system of property rights that reduced company allocations. He provided examples of the company's conservation ethic, its use of various modified fishing gears to reduce by-catch, and its monitoring and research programmes. He pointed out that although these controls have increased harvesting costs, the property rights regime has allowed the company to integrate its planning in such a way that the benefits ultimately outweigh the costs. With respect to applying an EBFM approach to fisheries, he expressed concern that management restrictions and complexities would increase, and said a timeline allowing industry to build capacity to meet the new challenges ought to be considered.

Kristján Thorarinsson, Population Ecologist for the Federation of Icelandic Fishing Vessel Owners, responded to the question of how industry will react to demands of sensible use of marine resources by explaining that his industry was making those demands itself, which he attributed to Iceland's rights-based system. He stated that although EBFM would most likely be implemented gradually, the fishing industry in Iceland was already moving in that direction, because of the nation's high dependence on fishing. He lamented that the industry was not more visible in debates over resource management and underscored the need for more communication and understanding between all key stakeholders.

Ross Tocker, General Manager of Operations at Sealord Group, discussed the impact of the fisheries system used in New Zealand, where a property-rights quota system exists. He said this system had helped establish sustainability as a key corporate objective, resulting in voluntary industry initiatives, such as a code of practice to avoid catching fur seals. He urged the eradication of incentives for vessel overcapitalization.

Volker Kuntzsch, Buying Director of Frozen Fish International, said this Unilever-owned company is a processing business that has established sustainability as an objective, and has set itself the goal of buying all its fish from sustainable sources by 2005. He said this goal would be difficult given fish stock declines, and advocated an ecosystem approach to tackle such declines. He expressed concern that some policy makers and other stakeholders remain unaware of the fish stock crisis, and questioned the value of subsidies for this sector. Supporting a multi-stakeholder approach, he called for action rather than further expressions of concern or consensus on the problem.

**Discussion:** In the ensuing discussion, one participant said timely action is necessary in tackling fish stock problems before they reach a crisis stage, and urged that such action take into account the socio-economic implications for fishing communities. In response to a question on the rights-based approach, Ross Tocker said allocating property rights ensures that sustainability becomes a priority for the owner of the

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right – namely the company – as well as for government. If there is no property right, then individual businesses simply compete for fish with other companies.

**Other presentations:** Participants attending the Scientific Symposium also heard brief presentations from several speakers outlining their respective organization's or agency's involvement in EBFM. Jonathan Peacy of New Zealand's Ministry of Fisheries described the country's rights-based policies for managing fisheries. Noting that New Zealand has only recently started to develop an ecosystem based approach, he emphasized that it is built on strong foundations, including the fact that major fish stocks are at target levels or rebuilding towards these levels, that there is only minimal overcapacity, and that there is strong monitoring, control and surveillance. He stated that there are no subsidies for industry, and outlined a number of by-catch mitigation measures that have been introduced.

Duncan Leadbitter, International Fisheries Director for the Marine Stewardship Council, outlined the Council's activities as the non-profit, standard-setting body set-up to evaluate fisheries that are sufficiently sustainable to carry an eco-label. He said the certification process is science-based, non-discriminatory and transparent, and noted that the Council has recently undergone a review to improve its governance structures, and is improving its assessment process.

Malcolm Windsor, Secretary of the North Atlantic Salmon Conservation Organization (NASCO), outlined this international body's work in contributing to the conservation and rational management of a single species, including its action plan taking a precautionary approach.

**CONCLUDING REMARKS FROM THE SYMPOSIUM:** The Scientific Symposium officially concluded its work late Tuesday afternoon. Co-Chair Michael Sinclair thanked the translators and the FAO Secretariat, and praised the Icelandic organizing team for their efficiency. He also thanked the Governments of Iceland and Norway and the speakers for their significant work addressing the issue of responsible fisheries, noting that their papers will contribute toward this conference's Reykjavik Declaration and to the World Summit on Sustainable Development in 2002.

On Wednesday morning, 3 October, Co-Chair Sinclair presented the Co-Chairs' conclusions from the Symposium prior to a Plenary session of the Reykjavik Conference, as he had been unable to present their conclusions the previous day due to time constraints. Co-Chair Sinclair said the Symposium had: summarized current understanding of the structure and functions of marine ecosystems and our ability to model them; synthesized the impacts of human activities on marine ecosystems; and addressed how ecosystem considerations can be incorporated into fisheries management. He noted that industry representatives were receptive to applying EBFM to marine resources, but concerned about the time-scale and costs involved in incorporating this approach. He highlighted participants' concerns about overfishing driven by fishing fleet overcapacity, and their expressions of support for rights-based fishing. He noted that although no formal definition of EBFM had been agreed to, there was consensus that an EBFM approach contained the following features: integrated management of multiple fisheries and other ocean uses within a geographic context; incorporation of a broader set of objectives than currently exists; and direct management of human activities, rather than the ecosystem itself. Although additional knowledge on marine ecosystems was needed, he drew attention to agreement among speakers that the introduction and development of EBFM should start now and that it could be initiated in both developed and developing countries. Co-Chair Sinclair noted a lack of consensus on the geographical boundaries within which regulatory plans for marine resource uses would be evaluated in the context of ecosystem objectives, and noted that management capacity would have to be

increased to meet new governance requirements. He concluded that EBFM would probably be implemented through an evolutionary, not revolutionary, process and that the precautionary principle was an integral component in the EBFM approach.

### **SECOND PLENARY SESSION – FRAMEWORK FOR FUTURE ACTION**

On Wednesday, 3 October, delegates attending the Reykjavik Conference convened for a second Plenary session aimed at elaborating a framework for future action on EBFM. Participants heard 33 statements from country representatives and 11 from UN agencies, intergovernmental and non-governmental organizations. Following field trip excursions to local fisheries-related sites on Thursday morning, the Plenary session resumed on Thursday afternoon to consider and adopt the conference's Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem.

Chair Árni Mathiesen opened the session on Wednesday morning, introducing the issue of moving towards EBFM and drawing delegates' attention to a conference briefing document entitled *Towards Ecosystem-based Fisheries Management* (Reykjavik document 2001/4). He noted the importance of marine resources in food security and stressed the need to reduce the percentage of overexploited fish stocks. Recognizing that current understanding of marine ecosystems is insufficient to make it the basis of fisheries management and that EBFM should supplement rather than replace traditional management schemes, he underscored the importance of moving towards EBFM as a long-term goal.

**COUNTRY STATEMENTS:** During the country statements segment, many delegates thanked the FAO and the Government of Iceland for organizing the conference and the Norwegian Government for co-sponsoring the event. Some speakers said the Scientific Symposium had increased knowledge on how sustainable and responsible fisheries can be developed. A number of countries supported the need to fully implement existing international treaties and agreements such as the FAO Code of Conduct for Responsible Fisheries, and several called for entry into force of the UN Fish Stocks Agreement. Delegates also highlighted the role of this conference in contributing to the World Summit on Sustainable Development, which is taking place in Johannesburg in September 2002. In addition, several developing country representatives stated that socio-economic pressures and inadequate budgets and expertise presented obstacles to implementing international fisheries instruments and to effective fisheries management, and called for international and regional cooperation and support.

Iran observed that due to the common nature of marine resources, cooperation and coordination between neighboring countries was necessary, and requested that the FAO and the international community provide assistance to achieve this. Saint Lucia supported the imposition of sanctions against entities that fish unsustainably, and recommended that the FAO host a forum to share the findings of this meeting with small states, tailored to their needs and discouraging them from entering into agreements with irresponsible fishing entities. He also called for more research on consumption habits of large marine mammals, urging countries to respect scientific findings even if they contradict their national political agendas.

Uganda noted that artisanal fisheries remain prevalent in many developing countries, and stated that issues relating to shared water bodies need to be addressed. He supported a rights-based approach to fisheries management and said certification schemes should not create barriers to trade. Viet Nam highlighted the limitations imposed on developing countries and LDCs due to lack of resources, underscoring the importance of international and regional support and cooperation.

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Namibia, on behalf of the Southern African Development Community (SADC), a group of 14 southern African states, said ecosystem management should be a long-term complement to current approaches, without replacing them. Requesting that this conference clearly define EBFM, he warned against any attempt to use this approach to justify economic restrictions or distortions.

Norway stressed that all marine resources, including marine mammals, could and should be used in EBFM as long as it is sustainable, and rejected prohibiting the use of any species, unless based on scientific grounds. Noting that international ecosystem instruments are already in place, he said it was "disturbing and alarming" that some states were trying to "detract" from results already achieved and agreements already reached. New Zealand drew attention to inadequate knowledge of marine ecosystems, which he said affected policy making. He highlighted the value of rights-based systems, incentives for fisheries to minimize harmful impacts, and the effectiveness of single stock management as an important element in supporting ecosystems.

The US underscored the need to bring into force current multilateral agreements and other legal instruments regarding fisheries management, asked for all entities to help increase the capacity to enable an EBFM system, and called for immediate commencement and subsequently incremental adoption of EBFM approaches. Ecuador noted the potential for fisheries to increase both the value and diversity of its economic base and requested practical recommendations that will allow it to sustainably manage its fisheries sector. Japan underscored the need to: reduce environmental contamination; promote a balance between utilization and conservation; restrain transfer of fishing capacity to other states; better manage the aquaculture sector; and ensure that new management frameworks do not impede states' ability to manage their own resources.

Iceland called for all participants to strive towards producing a Reykjavik Declaration from this conference that expresses an international commitment to manage marine resources sustainably. Morocco called for international solidarity and expressed a willingness to adopt measures necessary for sustainable management of fisheries. The Republic of Korea noted that the conference's Declaration would be a voluntary initiative and should be consistent with Agenda 21. He supported an integrated national ocean agency as an effective institution in dealing with marine issues, and announced that it was hosting the first APEC Ocean-related Ministerial Meeting in April 2002.

Ghana supported the EBFM concept and noted inadequate data and lack of political will as obstacles to progress. Australia stressed its commitment to EBFM approaches and called for the removal of subsidies that support fishing fleet overcapacity. He highlighted Australia's 1998 Oceans Policy and measures such as by-catch policies and marine protected areas.

The European Community identified three priority areas for action: fisheries management, which includes taking a multi-species approach, implementing existing treaties and reducing fishing activities to sustainable levels; research on marine ecosystems, fishing techniques and gear; and cooperation through existing international and regional organizations. Mexico endorsed the multi-stakeholder approach, and greater coordination to avoid work overlaps and increase understanding of marine ecosystems. She also called for greater selectivity in fishing gear use.

Canada called for a clear set of objectives and principles in defining EBFM and reiterated the need to take pragmatic, evolutionary steps and increase management capacity to achieve EBFM goals. Algeria said the conference Declaration should create an award for sustainable fisheries

management and establish a scientific body, whose task would be to provide information to support and promote responsible fisheries management.

El Salvador, speaking on behalf of Central American countries, outlined their regional approach to developing responsible fisheries management, including steps to coordinate relevant policies and harmonize legislation. Brazil said this conference represents one significant step toward the sustainable use of the fisheries resource and full implementation of the FAO Code of Conduct. India described its ongoing work on fisheries management, and stressed the need to address tensions between short-term socio-economic interests and long-term ecological considerations. Bangladesh called for further work on assessing marine resources. He noted a lack of resources to implement fisheries policies and called for more financial and technical assistance.

Chile said it was clear that much of the world's fisheries are overfished and noted the view of many participants that a reduction in fishing effort is one solution. He said the move to incorporate an EBFM approach should take into account a country's unique conditions and circumstances, adding that traditional management tools that have proven themselves should be strengthened.

Noting that a presenter during the Scientific Symposium had questioned its fisheries statistics, China stated that its information was valid and verifiable. He also announced that China was considering promulgating a national action plan for sustainable fisheries management. Cameroon said its fisheries are declining and requested that any ecosystem-based measures be implemented on a collective rather than individual country basis. Indonesia noted that the potential for its fishing sector to contribute to national GDP is being significantly compromised by illegal, unreported and unregulated fishing. Malta said it would appreciate more discussions on the tensions between commercial and artisanal fishing and on the respective gears used. Mauritania called for implementation of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.

Cuba warned that non-sustainable fisheries management increases inequality and damages coastal areas and highlighted existing treaties and instruments as providing a path forward. He supported further sharing of information and experiences. Thailand said the marine ecosystem is being degraded and outlined domestic measures, such as protected areas and seasonal closures. He supported greater awareness building and outreach to the fisheries community. Tonga said ecosystem management of fisheries is a fairly new concept for some small island states in the Pacific, and added that for some of these states, fisheries are one of their few resources.

Ukraine suggested some "next steps" toward responsible fisheries, including increasing ecosystem-related research, and further strengthening the management of marine resources at the international, regional and subregional levels. He took note of the costs involved in an EBFM approach.

**STATEMENTS BY INTERGOVERNMENTAL AND NON-GOVERNMENTAL ORGANIZATIONS:** Following country statements, participants heard presentations from representatives of UN bodies and agencies and from intergovernmental and non-governmental organizations.

The World Bank said it has been increasingly recognizing the role that fisheries play in addressing poverty. Outlining some World Bank initiatives in this area, he noted that the Global Environment Facility has over the last two years committed increasing resources to marine research. In addition, the Bank has established a global fisheries trust fund and recently published a guide to legislating for sustainable fisheries.



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The Secretariat of the Convention on Biological Diversity noted that the ecosystem and precautionary approaches – which have been highlighted at this meeting – form an integral part of the Convention. Highlighting the Convention's emphasis on collaboration and coordination, she expressed confidence that the Convention's objectives can be implemented at an operational level in the fisheries management area.

Noting a focus at this conference on taking a holistic approach, the North Atlantic Marine Mammal Commission (NAMMCO) said marine mammals form an important element in the marine ecosystem. She highlighted a NAMMCO study of consumption patterns by mammals such as minke whales that found a "substantial" impact on fish stocks.

The Inter-American Tropical Tuna Commission said the conclusions from the Scientific Symposium should contain clear guidance on how to proceed with EBFM. He informed delegates that the Commission has increased its data collection and research in recent years. It has also recently developed a model to assess the ecosystem impacts of tuna fishing that found possible biomass increases resulting from fishing gear improvements.

The Latin American Organization for Fisheries Development questioned whether fisheries management was most effectively addressed in a global setting, commenting that national and regional solutions can only be found in local contexts. He cautioned that EBFM should not lead to new non-tariff barriers to trade and rejected eco-labeling schemes, stating that they are developed for political and commercial reasons, rather than to promote responsible fisheries.

The OECD drew attention to two recently released OECD reports indicating that ecosystem based management systems will require considerable adjustment costs. The Southeast Asian Fisheries Development Center announced a conference on Sustainable Fisheries for Food Security in the New Millennium to be held in Bangkok, Thailand from 21-24 November 2001 in collaboration with the FAO.

An NGO spokesperson on behalf of Iceland Nature Conservation, WWF, Greenpeace, Royal Society for the Protection of Birds, Seas At Risk and North Sea Foundation outlined principles for using an EBFM approach, including: adopting a holistic approach that recognizes the importance of maintaining ecosystem processes and structures; ensuring that short-term interests do not override long-term effects; and not featuring predator control for marine mammals in sustainable fisheries management. He announced that this group of NGOs could not support any Declaration that involves manipulating marine mammal populations.

Friends of the Earth expressed concern that EBFM might end up being more of a "technicality" than an actual tool in managing fisheries, cautioned against IFQs and MPAs, and stressed the importance of preserving traditional knowledge held by fishers and coastal communities, acknowledging that this knowledge is an integral part of fishing itself.

The International Coalition of Fisheries Associations said fish conservation and fisheries management must be based on the best scientific information available, and that the fish and seafood industry should be fully involved in its design and implementation. He also stated that unwarranted restrictions on sustainable fisheries harvests should be avoided, as should measures that impose undue restrictions on trade.

The International Fishmeal and Fish Oil Organization highlighted the need to reduce and eliminate illegal, unreported and unregulated fishing, and to address the problem of overcapacity. He urged delegates to agree to eliminate or reduce discards, a practice he described as "bizarre" and wasteful, arguing that discards should instead be processed and used for food or fishmeal.

### REYKJAVIK DECLARATION: On Thursday evening, 4

October, delegates reconvened in Plenary to consider an outcome document from this conference, the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem. This Declaration was the result of extensive discussions and negotiations among FAO Member States, which were held in an open-ended drafting committee established at the start of the conference. Conference Chair Arni Mathiesen reported that the drafting committee had concluded on Wednesday evening, although it had not cleared all the outstanding brackets in the text. He informed participants that consultations continued throughout Thursday and had produced an unbracketed Chair's text in consultation with Abraham Iyambo, who had chaired the drafting committee. This clear text proposed compromise language aimed at achieving a consensus among delegates on the final wording of the Declaration.

Delegates were then briefed on the differences between the new clear text and the bracketed document prepared the previous day by the drafting committee. Key differences in the new text included:

- an addition to a preambular paragraph reaffirming that UNCLOS sets out the rights and duties of States with regard to the use and conservation of the ocean and its resources to note that this includes the conservation and management of "living marine resources";
- the removal in other paragraphs of a proposed reference to "living marine resources," and its replacement by the term "fisheries management";
- removal from a preambular paragraph recalling various recent international agreements of references specifically identifying the Convention on Biological Diversity and the Jakarta Mandate on Marine and Coastal Biological Diversity, and the FAO Code of Conduct for Responsible Fisheries;
- removal of a specific reference to considering the "consumption of fish by marine mammals" in a preambular paragraph affirming that incorporating ecosystem considerations implies increased attention to interactions among species of living marine resources;
- the deletion of a proposed paragraph recognizing that "market distortions affect the ability of states to implement sustainable management based on ecosystem considerations"; and,
- the deletion of a proposed paragraph stating that "market countries responsibility including consumer education should be exercised to ensure that free market access by illegal, unreported and unregulated fisheries does not compromise the marine environment."

Following a short interval for delegates to consider the proposed text, Chair Mathiesen reconvened the meeting and asked whether the Declaration could be adopted. Japan indicated that although it would not block the consensus, it would abstain from joining the consensus. Delegates then adopted the Declaration by consensus.

**Reykjavik Declaration – adopted text:** The final text of the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem contains a preambular section and the actual declaration.

The preambular section reaffirms that UNCLOS sets out the rights and duties of States on the use and conservation of the ocean and its resources, including the conservation and management of living marine resources, and also recalls agreement on several additional commitments, including the Rio Declaration on Environment and Development and Agenda 21. It confirms that including ecosystem considerations in fisheries management aims to contribute to long-term food security and human development, as well as effective conservation and sustainable use of the ecosystem and its resources. It appreciates the opportunity for multi-stakeholder interaction provided at this conference, and notes that the sustainable use of living marine resources contributes significantly

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to food security, provides for the livelihood of millions of people, and is critical to many national economies, particularly low-income food deficit countries and small island developing States. The preambular section also states that including ecosystem considerations provides a framework to enhance management performance, and affirms that these considerations imply more effective conservation of the ecosystem and more sustainable use, and an increased attention to interactions, such as predator-prey relationships, among different stocks and species of living marine resources. It also entails an understanding of the impact of human activities on the ecosystem.

The preambular section recognizes the need to strengthen and sustain management capacity to incorporate ecosystem considerations, and stresses the need for further development of scientific knowledge on the ecosystem and the ecological impact of fishing. It recognizes that certain non-fishery land- and sea-based activities have an impact on the marine ecosystem and have consequences for management, and that most developing countries require international support and cooperation to face the challenge of incorporating ecosystem considerations into fisheries management.

The Reykjavik Declaration states that, in an effort to reinforce responsible and sustainable fisheries in the marine ecosystem, "we will individually and collectively work on incorporating ecosystem considerations into that management to that aim." It further declares:

- a determination to continue effective implementation of the FAO Code of Conduct, the International Plans of Action formulated in accordance with the Code, and the Kyoto Declaration on the Contribution of Fisheries to Food Security;
- a "clear need" to introduce immediately effective management plans with incentives that encourage responsible fisheries and sustainable use of marine ecosystems, including mechanisms for reducing excessive fishing efforts to sustainable levels;
- the importance of strengthening and, where appropriate, establishing regional and international fisheries management organizations that incorporate ecosystem considerations, and improving cooperation between relevant bodies;
- that the interaction between aquaculture development in the marine environment and capture fisheries should be monitored through relevant institutional and regulatory arrangements;
- a determination to strengthen international cooperation to support developing countries in incorporating ecosystem considerations into fisheries management, particularly in building expertise for collecting and processing the biological, oceanographic, ecological and fisheries data for designing, implementing and upgrading management strategies;
- a resolution to improve the enabling environment by encouraging technology transfer where appropriate, introducing sound regulatory frameworks, examining and removing where necessary trade distortions, and promoting transparency;
- urging relevant international technical and financial organizations and the FAO to provide States with access to technical advice, paying special attention to developing countries; and,
- encouraging the FAO to work with experts internationally to develop technical best practices guidelines on introducing ecosystem considerations into fisheries management, to be presented at the next session of the FAO Committee on Fisheries.

The Declaration also states that, while immediate action on particularly urgent problems using a precautionary approach is needed, scientific knowledge needs to be advanced in several areas, including: the sustainable management strategies that incorporate ecosystem considerations; characteristics of relevant marine ecosystems, diet composition and food webs, species interactions and predator-prey relationships, and the role of habitat and factors affecting ecosystem stability and resil-

ience; systematic monitoring of natural variability, and its effect on ecosystem productivity; monitoring of by-catch and discards in all fisheries; fishing gear and practices; and the adverse human impacts of non-fisheries activities.

The Declaration concludes with a request to the Government of Iceland to convey the Declaration to the UN Secretary-General, FAO Director-General, Chair of the World Summit on Sustainable Development, and relevant organizations, for their consideration.

**Statements on the Declaration:** Following the adoption of the Reykjavik Declaration on Thursday evening, Japan and Saint Lucia made statements clarifying their respective positions.

Japan expressed disappointment that the Declaration had in its view failed to address a number of major issues that were the theme of the conference. Describing it as a "regressive step and missed opportunity" to move toward the inclusion of ecosystem considerations in fisheries management, he explained that one source of disagreement in the drafting committee had been the use of the term "living marine resources," which he had deemed appropriate, as it had been used in UNCLOS and other UN and FAO agreements and documents. He said Australia, the US and New Zealand had refused to accept this term in the Declaration, and argued that this "puts us back 20 years" and contradicts the aims of ecosystem management. He said discussions during the Scientific Symposium on the role of marine mammals and consumption of fish by marine mammals should have been reflected in the Declaration, and said some countries' refusal to include it had turned this into a political meeting along the lines of the International Whaling Commission (IWC). He also expressed disappointment that the Declaration had not included a proposed paragraph on market access and illegal, unreported and unregulated fishing, which he believed was a key issue at this conference. He affirmed Japan's commitment to responsible fisheries and including ecosystem considerations.

Saint Lucia indicated that although it had joined the "spirit of consensus," it believed that the Declaration had not paid sufficient attention to marine mammals and their consumption patterns. He stated that in spite of reports indicating a substantial increase in whale populations since the moratorium in 1986, the focus continued to be on industry overcapacity rather than on dietary habits of marine mammals. He noted that the IWC was hosting a meeting in Saint Lucia to discuss marine mammals' consumption of fish species. Asserting the use of a "blocking mechanisms approach" by some states to marine mammals and their role in EBFM, he said this issue should be de-politicized.

### **CLOSE OF THE CONFERENCE**

Following the adoption of the Reykjavik Declaration in Plenary on Thursday evening, Chair Mathiesen introduced the draft administrative report on the conference. After agreeing to several amendments proposed by delegates, including annexing the informal report of the Co-Chairs of the Scientific Symposium, delegates adopted the administrative report.

In his closing remarks, Chair Mathiesen said the organizers and sponsors of this scientific conference had aimed to promote an exchange of knowledge and to provide input to the World Summit on Sustainable Development in 2002. He suggested that overfishing and incentives for fisheries rationalization in the context of rights-based fishing had been two areas highlighted during the sessions that had focused on exchanging knowledge. With regard to the second aim of providing input to the World Summit, he noted that although achieving consensus on the Reykjavik Declaration had not been easy, ultimately the "many hours of hard work" had produced a result that he believed would provide very useful input for the World Summit. He thanked the drafting committee Chair, Abraham Iyambo, for his skillful handling of

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discussions on the Declaration. He also thanked the FAO staff and Secretariat who had made this conference a reality and Iceland's Fisheries and Foreign Affairs Ministries for their invaluable work, as well as other local organizers. He expressed his appreciation to all who had participated in the meeting, and closed the conference shortly after 7:00 pm.

### THINGS TO LOOK FOR

**FIRST UNEP/GEF GLOBAL INTERNATIONAL WATERS ASSESSMENT (GIWA) GENERAL ASSEMBLY:** The General Assembly of the GIWA project will take place from 9-11 October 2001 in Kalmar, Sweden. For more information contact: GIWA Coordination Office, Kalmar; tel: +46-480-447350; fax: +46-480-447355; Internet: <http://www.giwa.net>

**SECOND TECHNICAL CONSULTATION ON THE SUITABILITY OF CITES CRITERIA FOR LISTING COMMERCIALY-EXPLOITED AQUATIC SPECIES:** This meeting will convene from 22-25 October 2001 in Windhoek, Namibia. Government representatives will review and approve FAO analysis and framework for evaluating the status of commercially-exploited aquatic species in a CITES context. For more information, visit: <http://www.fao.org/fi/meetings/cites/cites2/default.asp>

**FAO GOVERNING BODIES:** The 121st and 122nd Sessions of the FAO Council will be held in Rome from 30 October - 1 November and 14 November 2001 respectively. The 31st FAO Conference will take place from 2-13 November 2001 in Rome. For more information on specific meetings, visit: <http://www.fao.org/events/index.asp>

**WORLD FOOD SUMMIT - FIVE YEARS LATER:** This meeting will convene from 5-9 November 2001 in Rimini, Italy. Participants will review progress towards the 1996 World Food Summit goal of reducing the number of hungry people by half by 2015 and consider ways to accelerate the process. For more information contact: Mieko Ikegame, FAO; tel: +39-06/5705-4706; e-mail: [meiko.ikegame@fao.org](mailto:meiko.ikegame@fao.org); Internet: <http://www.fao.org/news/2001/010304-e.htm>

**SUSTAINABLE FISHERIES FOR FOOD SECURITY IN THE NEW MILLENNIUM:** This conference will take place from 21-24 November 2001 in Bangkok, Thailand. Established in response to calls for a re-evaluation of current fisheries practices in Southeast Asia, this conference will seek to formulate resolutions to develop a common vision and purpose for fisheries management in the region. A Millennium Fisheries Exhibition aimed at the commercial fishing and aquaculture industry will also take place. For more information contact: Conference Secretariat; tel: +66-2-940-6326; fax: +66-2940-6336; e-mail: [conference@seafdec.org](mailto:conference@seafdec.org); Internet: <http://www.baird.com.au>

**INTERGOVERNMENTAL MEETING ON PROTECTION OF THE MARINE ENVIRONMENT FROM LAND-BASED ACTIVITIES:** The First Intergovernmental Review Meeting on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) will take place in Montreal, Canada from 26-30 November 2001. For more information visit: <http://www.gpa.unep.org>

**SEVENTH INTERNATIONAL COASTAL SYMPOSIUM:** This international symposium will convene from 25-29 March 2002 in Templepatrick, Northern Ireland. This multi-disciplinary event will involve discussions among scientists, engineers and managers on the latest advances in the scientific understanding, engineering and environmental issues of coastal processes. For more information contact: Coastal Research Group; tel: +44-028-70324429; e-mail: [ICS2002@ulst.ac.uk](mailto:ICS2002@ulst.ac.uk); Internet: <http://www.science.ulst.ac.uk/ics2002/>

**CONFERENCE ON BENTHIC DYNAMICS:** The international conference on Benthic Dynamics – *In Situ* Surveillance of the Sediment-Water Interface – will convene from 25-29 March 2002 in Aberdeen, Scotland. It is organized by the University of Aberdeen and will focus on: organism-sediment relationships; biogeochemistry and organic diagenesis; hydrodynamics at the sediment-water interface; natural and anthropogenic disturbance, and studies of spatial and temporal phenomena in disparate benthic habitats. For more information contact: Martin Solan, Ocean Laboratory and Centre for Ecology, University of Aberdeen; tel: +44-13-587-89631; e-mail: [m.solan@abdn.ac.uk](mailto:m.solan@abdn.ac.uk); Internet: <http://www.abdn.ac.uk/ecosystem/conference/>

**SIXTH CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIODIVERSITY/CARTAGENA PROTOCOL MOP-1:** CBD COP-6 will take place in The Hague, The Netherlands, from 8-26 April 2002. This gathering will also serve as the First Meeting of the Parties (MOP-1) to the Cartagena Protocol. For more information contact: CBD Secretariat, Montreal, Canada; tel: +1-514-288-2220; fax: +1-514-288-6588; e-mail: [secretariat@biodiv.org](mailto:secretariat@biodiv.org); Internet: <http://www.biodiv.org>

**2002 APEC OCEAN-RELATED MINISTERIAL MEETING – TOWARDS SUSTAINABILITY OF MARINE AND COASTAL RESOURCES:** This Meeting will convene from 22-26 April 2002 in Seoul, Republic of Korea. Government ministers from APEC members are expected to attend this meeting, which aims to adopt a Declaration to contribute to the WSSD. For more information contact: Jhin-kyoo Chae; tel: +82-2-3148-6788; fax: +82-2-3148-6672; e-mail: [jkchae@momaf.go.kr](mailto:jkchae@momaf.go.kr)

**54TH ANNUAL MEETING OF THE INTERNATIONAL WHALING COMMISSION (IWC):** This meeting will take place in May 2002 in Shimonoseki, Japan. The IWC's Committees and Working Groups will meet at the same venue. For more information contact: IWC Secretariat, Cambridge, UK; tel: +44-1223-233971; e-mail: [iwc@iwcoffice.org](mailto:iwc@iwcoffice.org); Internet: [http://ourworld.compuserve.com/homepages/iwcoffice/2001\\_meeting.htm](http://ourworld.compuserve.com/homepages/iwcoffice/2001_meeting.htm)

**12TH MEETING OF THE STATES PARTIES TO THE UN CONVENTION ON THE LAW OF THE SEA:** This meeting will convene from 13-24 May 2002 in New York. For more information contact: UN Division for Ocean Affairs and the Law of the Sea; tel: +1-212-963-3968; e-mail: [doalos@un.org](mailto:doalos@un.org); Internet: <http://www.un.org/Depts/los/index.htm>

**CONFERENCE ON FISHERIES IN THE GLOBAL ECONOMY:** This event will take place from 19-22 August 2002 in Wellington, New Zealand. Organized by the International Institute of Fisheries Economics and Trade (IIFET), this event will provide a forum for participants to consider the future management of fisheries. For more information contact: IIFET 2002 Organizer; tel: +64-4-389-3487; fax: +64-4-389-3457; e-mail: [bruce.shallard@xtra.co.nz](mailto:bruce.shallard@xtra.co.nz); Internet: <http://www.iifet2002.com>

**ICELANDIC FISHERIES EXHIBITION 2002:** This event will be organized from 4-7 September 2002 in Kópavogur, Iceland. Held every three years, this exhibition will focus on all aspects of the commercial fishing industry. For more information contact: Marianne Rasmussen; fax: +44-1962-842-945

**WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT:** The World Summit on Sustainable Development will take place in Johannesburg, South Africa, from 2-11 September 2002. For more information contact: Andrey Vasilyev, DESA, New York; tel: +1-212-963-5949; e-mail: [vasilyev@un.org](mailto:vasilyev@un.org); Major groups contact: Zehra Aydin-Sipos, DESA; tel: +1-212-963-8811; e-mail: [aydin@un.org](mailto:aydin@un.org); Internet: <http://www.johannesburgsummit.org/>