Sustainable Developments
published by the International Institute for Sustainable Development

Volume 31, Number 3 Thursday, 9 September 1999

NORWAY/UN CONFERENCE ON THE ECOSYSTEM APPROACH FOR SUSTAINABLE USE OF BIOLOGICAL DIVERSITY

HIGHLIGHTS FROM THE NORWAY/UN CONFERENCE ON THE ECOSYSTEM APPROACH FOR SUSTAINABLE USE OF BIOLOGICAL DIVERSITY WEDNESDAY, 8 SEPTEMBER 1999

On the third day of the Norway/UN Conference on the Ecosystem Approach for Sustainable Use of Biological Diversity, participants met to hear presentations on the themes of cascading effects of resource exploitation on ecosystems and the ecosystem approach in marine resource use. At the end of the day, three informal working groups met to discuss and form recommendations on the discussions of the first three days.

CASCADING EFFECTS OF RESOURCE EXPLOITATION ON ECOSYSTEMS

Doris Soto, Universidad Austral de Chile, discussed the relevancy of ecosystem approaches in managing salmon populations and environmental services. Citing work in southern Chile, Soto noted the economic importance of salmon farming and its two key ecosystem needs: nutrient reutilization and proper water quality. She reviewed management efforts to enhance these services, coupling salmon farming and sport fishing with biodiversity use and management. She discussed efforts in freshwater and marine environments to increase bivalve and benthic populations for improving water quality and providing opportunities for sport fishing and mussel harvesting. Soto reviewed the successes of artificial freshwater and marine reefs in increasing species richness and biomass, restoring and sustaining longer food webs, and enhancing nutrient recycling. She also noted the importance of surrounding forest ecosystems for providing such services as moderating availability of freshwater and maintain water quality. In closing she supported the use of integrated coastal management involving multiple resources users.

Responding to a question on the impacts of salmon on the total ecosystem, Soto stressed the need to examine the issue at a global scale, while evaluating national comparative advantages and aquaculture technologies.

Juan Carlos Castilla, Pontificia Universidad Católica de Chile, talked on the future of coastal marine community and ecosystem approaches in invertebrate multi-species management and the need for spatial “take” and “non-take” networking and connectivity areas. He focused on benthic marine invertebrates, small-scale fisheries, and single and multi-species management plans. He noted new management practices for small-scale benthic resources in Chile and cited some of their key elements. They include: institutionalization of knowledge and appropriate legislation; incorporation of fisheries as the main actors; and territorial use rights in fisheries (TURFs). Since fishery legislation was enacted, Castilla emphasized that Chile has integrated conservation units, such as marine parks and reserves, with TURFs through a spatially connected model for multi-species and ecosystem management. He highlighted that the initial experiment with the small spatial scale approach for TURFs is currently operating at a national scale with 160 units. According to Castilla, this scaling up process presents new challenges, such as the implementation of direct stock assessment, larval transport, and connectivity and ecosystem co-management approaches.

In response to a question regarding whether he had looked at the IUCN protected management categories for marine protected areas (MPAs), Castilla responded that he had not and stressed that a country’s needs were more interesting than definitions. When asked about the role of community monitoring, Castilla said that local communities were being trained to do assessments.

John Munro, International Center for Living Aquatic Resource Management, spoke about the impact of fisheries on coral reef systems. He reviewed different forms of reef systems and their species, along with a variety of reef fishing methods. He noted that coral reefs are mostly fished by small-scale fishers from impoverished areas, generally as a last economic resort. According to Munro, catch value in conventional economic fisheries generally increases, peaks and then decreases, while both fishing efforts and costs continue to rise. He added that coral reef fisheries are different since the cost curve is not as steep given simpler methods, and there is no economic brake on overfishing. Citing studies from Jamaica and Tortuga, he noted that populations of larger fish tend to decline first, and smaller species then tend to predominate such systems. Munro stated that species stocks with longer pelagic larval lives have a better chance of survival as they can be replenished from spawning grounds in upstream areas. He further noted that upstream species depletion may prevent restoration of downstream stocks, possibly resulting in a cascade effect on other populations. Munro stressed the need for MPAs to facilitate fish stock restoration and mitigate human stresses on reefs.

Responding to a question on introducing larvae into depleted areas, Munro stated that such fish stock enhancement has not yet been done in the context of coral reefs, but could be a tool to be combined with MPAs. Munro mentioned other impacts (e.g., global warming, sedimentation, effluents) on coral reefs, although their interaction is still not understood.

Michel Loreau, Ecole Normale Supérieure de Paris, covered issues relating to the ecological and evolutionary conservation implications of species interactions in ecosystems. He emphasized that species and ecosystems are bound together by mutual ecological constraints and a shared evolutionary history so that in the long-term it may be impossible to conserve one without conserving the other. Using the evolution of plant-herbivore interactions as an example, Loreau noted that even though herbivores have a direct negative effect on plants through biomass consumption, they could have a positive effect on plants through nutrient recycling. He underlined that the positive ecological effect of this interaction contributes to evolutionary mutualism. He also raised the issue of biological invasion and the major threat it may pose to the biodiversity and preservation of ecosystems. He noted that local invasions in plant ecosystems fail most of the time, but exotic species introduction can replace entire resident communities. He added that by understanding the evolu-

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tionary constraints one can start to understand the adverse impacts of biological invasion. Loreau stressed the importance of developing an ecosystem approach to preserve species, while also focusing on species conservation.

In the discussion that followed, comments were made on the rate that species respond to evolutionary changes. Loreau responded that scientists were only beginning to understand rates of evolution, but evidence shows that larger animals can respond faster to environmental changes.

ECOSYSTEM APPROACH IN MARINE RESOURCE USE

Åsmund Bjordal, Norwegian Institute of Marine Research, talked about applying the precautionary approach to sustainable fisheries management. He noted that current fishing capacity exceeds net production of marine resources, and thus necessitates a tool for improved decision-making to avoid fisheries collapse. Bjordal described reference points for determining levels of sustainability, including: the lowest biomass limit for maintaining a fish stock; a precautionary limit to ensure that the lowest limit is avoided; a fishing mortality limit beyond which population dynamics are unknown or a stock collapses; and a precautionary fishing level to prevent exceeding the mortality limit. Sustainable fisheries management aims to keep biomass over the precautionary biomass limit and fishing levels under the precautionary extraction level. He provided the example of the Norwegian spring spawning herring, which collapsed in 1972, due to a large annual catch and unfavorable environmental conditions. After a ban on fishing, the stock recovered and a regional agreement was signed to moderate catch size. Bjordal proposed that responsible fisheries management entails concrete objectives, quality biological advice, informed catch limits, and control measures to prevent overshooting limits and by-catch. He stressed that sustainable fisheries are both indicators of and tools to improve healthy marine ecosystems. In closing, he noted that pollution is currently the most severe threat to marine ecosystems and the use of their living resources.

In the discussion, speakers mentioned the negative impacts of land degradation, siltation and other human activities on marine ecosystems. Responding to questions on the long-term effects of pollution versus over-fishing, Bjordal emphasized that fish stocks can recover faster from over-fishing through proper management techniques.

Chris Hopkins, International Council for the Exploration of the Sea (ICES), addressed integration of fisheries and environmental issues in relation to the evolution of the ecosystem approach. He provided a background for developing the precautionary approach in fisheries management and its further evolution towards integrating fisheries and environmental issues. He noted that principles guiding fisheries management include: utilization of the ecosystem in a manner consistent with sustainable development; biodiversity conservation; implementation of relevant global and regional agreements; application of the precautionary approach to the management of living marine resources; further integration of fisheries and environmental protection, conservation and management; integration of environmental objectives into fisheries policy; and involvement of fishermen and other relevant stakeholders. Hopkins then emphasized that commitment to action requires the maintenance of spawning stock biomass; protection of species and habitats; control and enforcement; science technology and economic impacts; and the implementation and review of progress. He stated that further evolution towards the ecosystem approach requires, *inter alia*: reference points for commercial target species; quantification of fisheries' effects on non-target species; and the establishment of broader conservation measures, including MPAs.

Regarding a question on the complimentarity of the ICES process with the objectives of the CBD, Hopkins responded that there was no conflict with ICES or its approach for providing scientific advice. Another participant added that the Biosafety Protocol and other conventions need to be taken into consideration when dealing with adverse environmental impacts on fisheries.

Karen Weaver, Convention on Migratory Species, presented on by-catch in fisheries and sustainable fisheries management. She stressed that access rights should be secured and open access regimes reformed, and that management should shift from a focus on fisheries to human activities. She noted that the type of by-catch generally correlates with fishing particular methods (e.g., seabirds with longline fishing and turtles with shrimp trawling). Weaver stated that responses to reducing by-catch have generally been technical in nature and due to external pressure, rather than from industry's own initiative. She then reviewed international legal instruments and the growth of an international environmental consciousness, which has focused on icon species (e.g., seals, dolphins, whales). She also noted examples of domestic legislation with trade implications, as well as eco-labeling and third party verification systems, such as the Marine Stewardship Council and "dolphin friendly" labeling. She briefly reviewed Australia's oceans policy, which includes a framework for assessment, allocation and management, as well as the development of regional plans, incorporating MPAs, sectoral conflict resolution and long-term security for resource users.

Responding to a question about whether by-catch causes species extinction, Weaver queried whether extinction is the appropriate criteria and suggested that the question should be what level of ecosystem change is acceptable. On the issue of shifting to more sustainable fishing technologies, she noted that fishers have generally responded more to political and social drivers and less to economic drivers.

Ransom Myers, Dalhousie University of Canada, spoke on over-exploitation and extinction in the ocean. He described how many local populations of fish have nearly been driven to extinction, such as the barndoor skate. He also mentioned the collapse of other fish stocks, such as cod, haddock and salmon. In some cases, Myers reported that certain sub-populations of fish have become extinct. He dismissed the belief that collapses were caused by such phenomena as cold water conditions, foreign fishing and seals, and said that they were primarily due to domestic over-fishing. He criticized the amount of subsidies provided to the fisheries industry, citing Canada as an example, and said it compounds environmental damage by increasing fishing capacity. By using meta-analysis, the compilation of world data on fish stocks, to estimate population dynamic parameters, Myers said it is possible to estimate conditions under which over-exploitation and extinction could occur and which management actions (e.g. reduced fishing mortality or marine reserves) could support the long-term viability of marine populations. He concluded by saying that extinction of fish stocks can be prevented through rational exploitation strategies, by eliminating subsidies and by creating large MPAs to preserve samples of pristine ecosystems.

THINGS TO LOOK FOR TODAY

Session 8 – Ecosystem Approach in Forest Resource Use: 9:00 am

Session 9 – Globalization vs. De-centralization: 2:00 pm

Panel Debate – What Chance for Local Resource Management in the Times of GATT and the WTO? 4:20 pm