PANELIST PRESENTATION

Long-Term Monitoring

Russell Bellmer, *National Oceanic and Atmospheric Administration Fisheries*

I am a marine ecologist working on dredging and disposal activities within the Fisheries' Office of Habitat Conservation of the National Oceanic and Atmospheric Administration (NOAA). I will talk about who we are, explain some of the things we are doing, and offer suggestions about future goals for the dredging community.

NOAA Fisheries is responsible for the management, conservation, and protection of living marine resources in the U.S. Exclusive Economic Zone. We also play a support and advisory role in the management of living marine resources in coastal areas under state jurisdictions, provide scientific and policy leadership in the international arena, and implement internationally agreed-on conservation management. We carry out our stewardship mission through science-based conservation and management and through promotion of a healthy environment.

NOAA Fisheries defines its mission as stewardship of living marine resources for the benefit of the nation through science-based conservation and management and promotion of the health of the environment. Our aim is to maximize benefits to the nation from living marine resources without compromising the long-term health of coastal and marine ecosystems. NOAA Fisheries manages for the sustainable use of living marine resources, including both consumptive and nonconsumptive uses, while striving to balance competing public needs and interest in the use and enjoyment of our living marine resources and also preserving their biological integrity. These management measures often include monitoring both natural and artificial marine habitats, including those created with dredged material.

Management authorities and legal mandates include the Magnuson-Stevens Fishery Conservation and Management Act, under which fisheries are regulated. Fisheries are regulated by our five regional offices along with eight fisheries management councils. They are responsible for preparing fisheries management plans, which identify fishing and nonfishing threats and contain conservation enhancement measures for fish populations in their habitats.

Under the Endangered Species Act (ESA), we are responsible for the protection of marine species listed as threatened or endangered and for identifying candidate species for such listings. ESA allows us to enter into cooperative agreements with states to implement conservation and recovery actions for listed species. ESA also allows for the establishment of conservation plans to protect, restore, and enhance habitat for listed species. Under the Marine Mammal Protection Act, we are responsible for protecting certain marine mammals, namely whales and seals. This act establishes a moratorium on the taking and importation of marine mammals and related products, with a few exceptions for scientific research and allowable incidental taking.

There are various other statutes that confer on us a mandate to reduce or mitigate the degradation and loss of

living marine resource habitats. These include the Clean Water Act; Federal Power Act; Fish and Wildlife Coordination Act; and Marine Protection, Research, and Sanctuary Act, among others. Under these statutes, NOAA Fisheries plays a primarily advisory role in reviewing proposed projects and other actions that may affect living marine resource habitats and in making recommendations for adequate conservation of those habitats.

We are using all these authorities, plus others, to look at ways to enhance and restore fisheries habitats. The implementation of the requirements under these acts cannot be addressed fully without long-term monitoring and sound partnerships among those using the marine environment. Based on long-term monitoring, it is known that many marine species are under stress from overexploitation or habitat degradation, or both. Nearly one-half of the fishing stocks for which we have scientific population information are below optimal population levels. Some populations of marine mammals, turtles, and fish are in danger of extinction, and many more are threatened by various human activities.

Habitat loss and degradation affect mostly inshore and estuarine ecosystems. The primary threats come from alteration of freshwater flows, loss of wetlands and submerged aquatic vegetation beds, reduction in shallow water habitat, and destructive fishing methods. Decreases in freshwater volume and flow rate stem from damming and diversions of major rivers affecting nearshore ecosystems that have adapted to seasonal discharge of fresh water. Agricultural practices such as logging contribute to siltation and can destroy spawning habitats and impede migratory paths. The loss of aquatic plant-based habitat resulting from development adversely affects a variety of food webs that are important to adults and juveniles of many marine and anadromous fish.

To fulfill our stewardship mission, we have identified three broad strategic goals: build sustainable fisheries, recover protected species, and restore healthy living marine resources habitats. All three goals have a habitat element. For example, to attain the sustainable fisheries goal, we are providing for increased recreational fishery opportunities through conservation, restoration, and enhancement of aquatic ecosystems. We are rebuilding commercial stocks through management regimes and regulations, which include reduced levels of exploitation, stock enhancement, habitat improvement, and bycatch reduction. To recover protected species, we are characterizing and assessing habitat need, and identifying and minimizing human actions that are detrimental to these precious species. We also recognize that the wise protection of healthy living marine resources habitats is crucial to the success of management and conservation efforts. To realize this goal, we are protecting, conserving, and restoring living marine habitat and biodiversity.

We also are implementing cooperative approaches at the local level in habitat conservation restoration. For example, it is the policy of the Chesapeake Bay program to measurably advance the beneficial use of dredged material to improve habitats in the bay. We also are involved in the Coastal Wetlands Planning, Protection, and Restoration Act project in Louisiana, which is using approximately 5,000 yd^3 (3,825 m^3) of dredged material for wetland restoration. When that project is done, we will have restored more than 80,000 acres (32,400 ha) of wetlands. We are considered a permit applicant, just like any dredge operator going through the permit processes, so we have some sympathy regarding that issue. We also are developing new methods of evaluating and monitoring the quality and productivity of restored habitats as well as improved restoration technologies to ensure that the created habitats are effective.

This stewardship activity depends on strong, effective partnerships. All federal agencies are experiencing budgetary constraints and increasing demands, and none can meet all the mandates on its own. We must collaborate with other organizations with similar mandates to achieve our mutual aims. These include other federal agencies, state and local governments, universities, environmental and industry groups, Native American tribes, and many others. We also must increase the reliability of our monitoring and science, explore new ideas, invest in new technology, undertake long-term monitoring, and continue to be willing to make difficult resource management decisions.

The NOAA Fisheries Habitat Research Plan seeks to accomplish the following activities, all of which involve long-term monitoring:

- Understand the structure and function of natural resource ecosystems, their linkages, and their role in supporting and sustaining an abundance and distribution of healthy living marine resources;
- Quantify the response of habitats and living marine resources to natural and human disturbances;
- Develop and evaluate new techniques to restore or create productive habitats using dredged material;
- Develop indicators to simplify determinations of habitat impacts or recovery; and
- Synthesize research and communicate findings to managers to ensure that sound science is part of the decision process.

We need to improve the quality and credibility of our science by

- Extending and improving peer review of scientific advice by panels of knowledgeable scientists from both inside and outside government;

• Improving professional standards for monitoring, research, and scientific advice by establishing national guidelines for technical programs;

• Implementing policies to ensure the integrity and independence of the science and assure that our monitoring programs, analysis, and products are sound, credible, and provide an objective basis for management;

• Developing new science-based resource assessment and management techniques; improving monitoring and analysis techniques and systems;

• Developing a new series of reports and presentations to communicate scientific results in simplified language; and

• Requiring the various monitoring and research programs to solicit input from external scientists in topical areas when identifying research initiatives.

We need to continue to build strong research partnerships, and we need to use the research and databases that we have. We are currently trying to improve the coordination of habitat restoration efforts between NOAA and its partners by assembling and maintaining a comprehensive database of restoration activities supported by NOAA. That database will be on the World Wide Web to share with others. Success stories in which NOAA Fisheries have played a significant role include the beneficial use of dredged material in projects such as the Poplar Island habitat restoration in Maryland and Galveston Bay wetland creation in Texas. We contributed to project design and baseline monitoring and will continue to provide ecological oversight.

Examples of long-term monitoring projects currently under way include studies on trophic linkages in created and natural salt marshes and long-term fisheries' utilization of created salt-marsh and eelgrass beds. We must place high priority not only on long-term monitoring, but also on demonstrating that restoration and enhancement can occur with present technology, and by promoting cost-benefit information. We need to publish and otherwise broadly distribute the results and lessons learned.

We need to address dredging and disposal activities by

• Applying the "ecosystem approach" and advanced planning to dredging programs;

• Undertaking appropriate scientific studies and long-term monitoring;

• Developing stricter regional and national criteria for economic analysis of dredging activities to differentiate between real and perceived needs;

• Placing greater emphasis on prevention of sedimentation and contamination at their sources;

• Developing mechanisms to improve coordination in the early stages of a proposed project;

• Undertaking the additional research and monitoring needed to increase knowledge of the functions of undisturbed ecosystems and habitats, the response of living marine resources to dredging and disposal activities, and the development of predictive models and associated risk assessments;

• Ensuring that the analysis of disposal alternatives considers the beneficial uses of living marine resources and the least environmentally damaging methods; and

• Seeing that resources to meet the requirements of regulatory process are commensurate with the expectations of the regulated industries, as well as other parties affected by dredging operations.

Armed with this information, the U.S. Congress and the public will be able to see the potential of beneficial use of dredged material and long-term monitoring, which should translate into support for public policy, programs, further technology development, and restoration of aquatic habitats.