POLICY STATEMENT
NATIONAL MARINE SANCTUARY PROGRAM

HUMAN-INDUCED ACOUSTIC IMPACTS ON MARINE LIFE
May 2007

PURPOSE

The purpose of this policy is to present how the National Marine Sanctuary Program (NMSP) will address the issue of human-induced acoustic impacts on marine life, given the NMSP's best understanding of the issue and availability of response options. It is made to provide direction and/or guidance for conservation management actions for the NMSP, and will be updated as necessary.

DEFINITION

Human-induced acoustic impacts on marine life are impacts resulting from human activities such as seismic surveys for oil and gas exploration and scientific research; commercial shipping for transportation of goods, and sonar systems for military purposes, fishing, and research.[i]

POLICY STATEMENT

The National Marine Sanctuary will use the tools and authorities at its disposal to prevent and/or mitigate human-induced acoustic impacts on sanctuary resources. Therefore the NMSP will:

- Encourage voluntary action by producers of human-induced sound to mitigate or eliminate actions that may impact sanctuary resources;
- Incorporate the risk of human-induced acoustic impacts into formal consultations, as appropriate, on activities affecting or potentially affecting sanctuary resources;
- As feasible and as necessary, consider regulation to mitigate or eliminate activities that generate human-induced acoustic impacts to sanctuary resources;
- Monitor the emergence of new scientific information in the field of acoustic research by attending and/or participating in relevant meetings with other agencies and academia and other activities as appropriate; and
- Develop partnerships with scientists to conduct passive acoustic research in sanctuaries and other research appropriate to sanctuaries and of interest to sanctuary decision makers.

Daniel J. Basta
Director

6/18/07
Date

BACKGROUND

While the field of marine acoustic research is an emergent science, much is already known about potential impacts of human-induced sound on marine life, in particular on marine mammals. The issue of such impacts on marine life has gained national and international recognition in recent years, due to the rise in human-induced sound in the ocean and highly publicized mass strandings of marine mammals that have been linked with the use of mid-frequency sonar. The National Research Council has written four reports in the past decade and a half relating to human-induced acoustic impacts on marine mammals[ii].

The main sources of human-induced sound identified by the community of acoustic experts are (not listed by order of importance) [iii]:

- Commercial shipping and transportation
- Dredging and construction (e.g., drilling and pile driving)
- Explosions
- Geophysical surveys
- Ocean science studies
- Oil and gas exploitation
- Commercial use of sonar
- Military use of sonar
- Scientific use of sonar

The nature of the sounds produced by these sources, intentionally or as a by-product, varies considerably, ranging from low frequency to high frequency, from low intensity to high intensity, from highly directional to omni-directional, and from continuous to intermittent or isolated duration. In addition, different marine organisms exhibit different sensitivities and vulnerability to human-induced sound. Thus, each sound source can have different impacts on marine life. When combined, multiple sound sources can have cumulative impacts on marine life, although this is an area that is particularly poorly understood. To this date, the overwhelming majority of research has focused on acoustic impacts to marine mammals; however, the resources protected and managed by the NMSP include all living marine resources in most national marine sanctuaries.

In 2003, Congress directed the Marine Mammal Commission (Commission) to "fund an international conference or series of conferences to share findings, survey acoustic 'threats' to marine mammals, and develop means of reducing those threats while maintaining the oceans as a global highway of international commerce." The Commission appointed the Advisory Committee on Acoustic Impacts on Marine Mammals (Committee) to fulfill that mandate. The goals of the Committee were to:

1) review and evaluate available information on the impacts of human-generated sound on marine mammals, marine mammal populations, and other components of the marine environment,

2) identify areas of general scientific agreement and areas of uncertainty or disagreement related to such impacts,

3) identify research needs and make recommendations concerning priorities for research in critical areas to resolve uncertainties or disagreements, and

4) recommend management actions and strategies to help avoid and mitigate possible adverse effects of anthropogenic sounds on marine mammals and other components of the marine environment.
Ultimately the various caucuses of the Committee were not able to reach consensus and developed their own statements. The Committee compiled these statements into one Committee report, which can be found at: http://mmc.gov/sound.

NMSP INVOLVEMENT

Under the National Marine Sanctuaries Act (NMSA), the NMSP has the authority to regulate certain sound-producing activities within sanctuaries, on a sanctuary-by-sanctuary basis, based on the list of activities that are subject to regulation in the designation documents of individual sites (which can be updated following NMSA requirements). For example, there are different types of activities using acoustic technology in sanctuaries, and they often require permits from NOAA's National Marine Fisheries Service (NMFS) under the Marine Mammal Protection Act.

There have been specific activities relating to human-induced acoustic impacts on marine life at several sanctuaries. Stellwagen Bank National Marine Sanctuary (SBNMS) has been building partnerships with scientists, as well as NMFS, for several years to conduct various acoustic research projects in the sanctuary. Various partnerships have been evolving with scientists from University of New Hampshire, Cornell University and the Woods Hole Oceanographic Institution, who are leading experts in the field of marine acoustics. This research will be useful in continuing to support and/or direct future management actions, such as shifting international traffic separation schemes to minimize interactions between large commercial vessels and endangered whales. In addition, in 2006 the NMSP/SBNMS recommended several mitigation actions necessary to minimize and/or mitigate impacts to sanctuary resources associated with the proposed construction and operation of two liquefied natural gas deepwater ports located one to two nautical miles outside of SBNMS. Through formal consultations under the NMSA the NMSP/SBNMS concluded that the proposed ports, both individually and cumulatively, were likely to have significant, constant, long-term, adverse effects upon marine resources and several mitigation measures were recommended. These recommendations included the use of three passive acoustic arrays to minimize vessel-whale collisions and acoustic exposure and to monitor the acoustic "footprint" of the ports during construction and operation. According to the U.S. Coast Guard's response to the NMSP, the installation and operation of all three arrays will be mandated as license conditions for these ports, if port licenses are approved. Final licensing decisions are expected in early 2007. These formal consultations represent a powerful example of how advances in acoustic research within national marine sanctuaries can be used to inform the design of methodologies for mitigating the impacts of human activities on sanctuary resources.

In 2003, the Sanctuary Advisory Council Conservation Working Group for the Channel Islands National Marine Sanctuary (CINMS) started exploring the issue of human-induced acoustic impacts on marine life and marine mammals in particular. The Conservation Working Group sponsored a report on the sources and impacts of noise in the Channel Islands. As a result, in September 2004, the advisory council made the recommendation to

the CINMS manager to start conducting acoustics monitoring in order to gain insight on the effects of human-made noise on sanctuary resources. This issue was highlighted as the CINMS Case Study for the 2005 Advisory Council Chairs Meeting in San Francisco, CA. As a result of this level of interest, the CINMS has partnered with researchers from the Scripps Institution of Oceanography who are conducting passive acoustic monitoring in the Santa Barbara Channel area.

Olympic Coast National Marine Sanctuary (OCNMS) issues permits for acoustic research and conducts annual surveys of marine mammals and seabirds that show seasonal concentration areas for marine mammals along the Sanctuary boundary and Canadian waters. This information has been used in the past by the Canadian government to restrict seismic surveys using airguns during the summer time feeding aggregations of humpback whales in these waters. Moreover, the OCNMS advisory council was involved in writing a comment letter to NMFS' Office of Protected Species regarding the development of threshold criteria for acoustic harassment of marine mammals.

Lastly, the issue of human-induced acoustic impacts on marine life was raised again at the 2006 Sanctuary Advisory Council Chairs meeting in Washington, DC at the request of the Chairs. Panel members presented topics such as acoustic science, management and policy, Stellwagen Bank NMS research, and the shipping industry's involvement in this issue.

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[i] Marine Mammals and Noise: A Sound Approach to Research and Management. Marine Mammal Commission Report to Congress. March 2007: i.

[ii] National Research Council of the National Science Academies. Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects. 2005. The National Academies Press: Washington, DC.

National Research Council of the National Science Academies.. Ocean Noise and Marine Mammals. 2003. The National Academies Press: Washington, DC.

National Research Council of the National Science Academies. Marine Mammals and Low Frequency Sound. 2000. The National Academies Press: Washington, DC.

National Research Council of the National Science Academies. Low Frequency Sound and Marine Mammals: Current Knowledge and Research Needs. 1994. The National Academies Press: Washington, DC.

[iii] Richardson, John W. *et al*. 1995. Marine Mammals and Noise. Academic Press: San Diego, CA.