



MARINE MAMMAL COMMISSION

7 March 2013

Ms. Maureen Bornholdt
Program Manager
Office of Renewable Energy Programs
Bureau of Ocean Energy Management
381 Elden Street, HM 1328
Herndon, Virginia 20170

Dear Ms. Bornholdt:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Bureau of Ocean Energy Management's 13 December 2012 notices calling for information and nominations (77 Fed. Reg. 74204) and indicating its intent to prepare an environmental assessment for commercial wind leasing and site assessment activities in offshore waters of North Carolina (77 Fed. Reg. 74218). The comment period for these actions was reopened on 5 February 2013 (78 Fed. Reg. 8190). The latter notice solicits comments regarding environmental issues and the identification of reasonable alternatives related to the proposed action. In response, the Commission offers the following recommendations and rationale.

RECOMMENDATIONS

The Marine Mammal Commission recommends that the Bureau of Ocean Energy Management—

- include an alternative that would limit site assessment and construction activities in the mid-Atlantic to the period from 1 May to 31 October; this requirement would minimize the likelihood of noise-related injuries and vessel strikes to endangered right whales and other coastal marine mammals;
- prepare an environmental impact statement—rather than an environmental assessment—because of the potential for significant effects from wind energy development, and the fact that much more development of this type is expected in this area in the near future;
- continue to support year-round, broad-scale, multi-year wildlife surveys in all areas of established or proposed energy development;
- work with the National Marine Fisheries Service, marine mammal researchers, and other federal and state government agencies as appropriate, to deploy an array of fixed passive acoustic recorders across the proposed leasing area to measure the ambient sound field, the presence of various marine mammals, and changes that may occur as a result of wind energy development in the area;
- work with the National Marine Fisheries Service, the Fish and Wildlife Service, the Marine Mammal Commission, and other federal and state agencies as appropriate, to finalize the biological survey guidelines before the Bureau issues wind energy leases; and

- ensure that its biological survey guidelines specify not only the type of information needed prior to and during site assessments, but also a system for compiling, archiving, and accessing such data.

RATIONALE

The Marine Mammal Commission supports the Bureau's efforts to develop offshore renewable energy. The Commission has commented frequently on the need for a long-term national energy strategy and agrees that alternative energy sources must be an important part of that strategy. Nevertheless, as with any new industrial activity proposed in U.S. coastal and offshore waters, the development of alternative energy sources should proceed in a thoughtful and deliberate manner with regard to its impact on the marine ecosystem, including marine mammals.

Types of risks to marine mammals

The production of wind-driven energy in marine areas poses several risks to marine mammals and the ecosystems of which they are a part. Sound and vessel activity associated with site assessment and construction, operation, and decommissioning of wind generators can disturb marine mammals and may interfere with important activities, including foraging, resting, socializing, and migrating. Pile driving for construction of meteorological towers and wind turbines generates low-frequency sound impulses that are detectable up to 40 km from the source (McIwem 2006), could impair hearing in marine mammals at close range (Madsen et al. 2006), and could lead to changes in behavior at intermediate distances. Support vessel activities pose some risk, likely small but not necessarily negligible, of collisions between ships and whales and also pose some risk of spills of fuel oil or other materials. The extent to which these risks may reduce long-term reproduction and survival of marine mammal populations in the area is an important consideration, but has yet to be evaluated scientifically.

The most immediate risks are from site assessment activities, which generally involve the use of sound-producing technologies to evaluate the sea floor and search for possible hazards. The effects of those technologies are not well understood. Some have been studied to a degree but others have received much less attention. For example, the potential effects of sub-bottom profilers used for geophysical surveys and to guide sub-bottom sampling have received little attention despite the fact that they generate sound source levels (201–205 dB re 1 μ Pa at 1 m) and frequencies (0.5–24 kHz) comparable to other sound sources that are considered to pose risks to marine mammal physiology (e.g., hearing) and behavior (e.g., habitat use) (Cox et al. 2006, Gordon et al. 2004) and may lead to more serious consequences (e.g., stranding with resultant mortality). Scientists have conducted some preliminary modeling exercises and studies with captive animals suggesting that exposure to profilers could cause a temporary threshold shift or behavioral response if animals are below the ship (Wood et al. 2012). Such studies demonstrate the potential for harm from exposure and warrant full consideration in the Service's analysis of whether profilers may cause more than a negligible risk to marine mammals.

The inclusion of an alternative to protect North Atlantic right whales

Several of the 37 species of marine mammals documented in waters off the east coast of the United States are listed as endangered or threatened (Waring et al. 2012). The North Atlantic right whale may be the species at most risk because of its small population size and high mortality rate from human activities (i.e., shipping and fishing). Sightings data and analyses indicate that right whales generally are coastal in distribution, but may occur 55 km or more offshore in the mid-Atlantic (Schick et al. 2009). The areas under consideration for wind energy development appear to overlap with the right whale's migratory corridor between feeding areas in the Gulf of Maine and calving areas to the south. The two proposed wind energy areas off Wilmington also may include part of the right whale's calving and nursery grounds (Garrison 2007). These areas are of sufficient potential importance that the National Marine Fisheries Service is considering a petition to expand right whale critical habitat to the mid-Atlantic (75 Fed. Reg. 61690).

Right whales also are of concern because they—especially mothers and calves—are vulnerable to vessel strikes (Moore et al. 2004; Kraus et al. 2005), and vessels will be required for site assessment, construction, and support operations. In addition, low-frequency sounds from vessels have been shown to result in habitat displacement, behavioral changes, and alterations in the intensity, frequency, and intervals of right whale calls (Rolland 2012).

The National Marine Fisheries Service has implemented regulatory measures to protect right whales in the western North Atlantic, including—

- the establishment of the mid-Atlantic seasonal management area extending from Brunswick, Georgia, to Wilmington, North Carolina, and within a 37-km radius of other major east coast ports; and
- the requirement that vessels greater than or equal to 19.8 m operating in the mid-Atlantic seasonal management area reduce speeds to 10 knots or less from 1 November to 30 April to reduce the risk of vessel strikes (73 Fed. Reg. 60173).

Those measures are helpful but insufficient to protect right whales because they do not encompass all areas proposed for wind energy leasing. They also do not address other activities involved in wind energy development, such as the introduction of noise during site assessment and construction activities.

A number of the potential impacts of wind energy development could be avoided if the Bureau were to limit site assessment and construction activities to the period of time when whales are not likely to be present (May through October). This limitation should not impose an excessive cost because weather and sea conditions likely would already limit development activities during the November to April period. Therefore, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management include an alternative that would limit site assessment and construction activities in the mid-Atlantic to the period from 1 May to 31 October; this requirement would minimize the likelihood of noise-related injuries and vessel strikes to endangered right whales and other coastal marine mammals.

Evaluating the effects of wind farm development

The effects of operating wind farms on marine mammals are not yet fully understood. Sound generated from wind turbine operations generally would be continuous, of low intensity, and at low frequencies (below a few kHz) (Tougaard et al. 2008). Sound energy would be transmitted directly to the water column from the turbine shaft and also to the sediment and then to the water column. The additional sound energy would be produced almost continuously during the lifetime of the wind farm. Playback experiments involving harbor porpoises and harbor seals prompted a distinct reaction by both species to wind-turbine sounds (Koschinski et al. 2003). A long-term study of harbor porpoise echolocation activity in the vicinity of a large-scale offshore wind farm in the Baltic Sea showed a significant decline in call rates during construction activities followed by a slow increase during wind farm operations; however, even after 10 years, call rates did not recover to baseline conditions (Teilmann and Carstensen 2012). The basic concern for those species would be whether the observed changes in behavior affect their survival and reproductive rates, which would be deemed biologically significant.

The National Environmental Policy Act requires assessment of such impacts for major federal actions. Either an environmental assessment or an environmental impact statement may satisfy the Act, but the latter is necessary when the federal action could possibly cause significant impacts. The Council on Environmental Quality's regulations implementing the National Environmental Policy Act require that significance be determined on the basis of both context and intensity (40 CFR § 1508.27). In determining the intensity of an action, the regulations direct agencies to consider, among other things—

- unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
- the degree to which the effects on the quality of the human environment are likely to be highly controversial;
- the degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks;
- the degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;
- whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment; and
- the degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

One can make reasonable arguments that most of the criteria apply in the present case. The waters off North Carolina have long been recognized as an important migratory corridor and feeding area for endangered and threatened marine mammals and sea turtles, as well as seabirds. Offshore wind energy development involves relatively new technology; therefore considerable uncertainty exists regarding potential short-term and long-term impacts on marine species and habitats. Furthermore, the proposed activities, and the manner in which they are managed, will set a

precedent for expansion of this technology throughout the western North Atlantic region—an area identified as having high potential for offshore commercial wind leasing. Finally, the extensive areas and long lives of the proposed offshore wind energy operations have the potential to result in significant cumulative impacts on the environment.

The substantial uncertainties during this early stage of the leasing process argue for a controlled, deliberate approach to the development of wind energy in the mid-Atlantic region. Such an approach would ensure that decision-makers consider a broad suite of alternatives that define sharply the environmental issues. A controlled, deliberate approach also would ensure that the potential effects of each alternative are thoroughly evaluated before leasing decisions are made, and that public input and participation in the process is maximized. The public is interested in wind energy development off North Carolina, as was made clear by the request for an extension of the public comment period associated with this action. To prepare the way for a controlled, deliberate approach, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management prepare an environmental impact statement—rather than an environmental assessment—because of the potential for significant effects from wind energy development, and the fact that much more development of this type is expected in this area in the near future. The Commission recognizes the need for expediency in wind energy development, but that need does not rule out the value of an environmental impact statement. Indeed, section 1500.5 of the regulations implementing the National Environmental Policy Act provides a number of guidelines for completing an environmental impact statement in an expeditious manner.

Adequacy of existing information

A thorough evaluation of the potential impacts of wind energy development will depend on the availability of biological and environmental information collected prior to leasing activities (i.e., baseline information) and during those activities. The information should be sufficient to identify and avoid potentially harmful effects on protected populations and habitats (e.g., existing marine protected areas, national monuments, essential fish habitats, designated critical habitats, and biological hotspots or areas of particular biological richness). It also should be collected at temporal and spatial scales necessary to characterize the inherent variability in the potentially affected ecosystems and distinguish the effects of energy development from that variability.

With regard to marine mammals, the most important biological information for assessing status and vulnerability to short- and long-term effects includes stock structure, distribution and seasonal movements, abundance and trends, and vital rates (e.g., survival, recruitment, emigration, immigration). An ecosystem-based management approach requires additional information on habitat-use patterns and trophic relationships. Other key environmental variables include ambient sound levels and ocean features such as temperature, salinity, and chlorophyll levels, both at the surface and at various depths. The collection of broad-scale biological and environmental information requires both an immediate and long-term commitment of effort and resources to provide the knowledge needed to detect adverse impacts associated with energy development and otherwise provide a strong foundation for responsible management of marine ecosystems.

Information on the majority of the species/stocks known to occur in the project area falls short of that required to assess their population status and vulnerability to various risk factors, and

to detect changes over time that may be caused by the proposed action. Many species/stocks have abundance estimates derived from infrequent or outdated surveys, and abundance estimates are not available for certain species (i.e., *Kogia* spp., beaked whales) (Waring et al. 2012). The Bureau's Environmental Studies Program, in collaboration with the Navy and the Fish and Wildlife Service, is providing multi-year funding to the National Marine Fisheries Service for the Atlantic Marine Assessment Program for Protected Species. That program involves a broad-scale, multi-year, seasonal collection of abundance and distribution data for marine mammals and other wildlife in the U.S. Atlantic, using visual aerial and shipboard surveys with towed passive acoustic arrays. The Commission commends this joint effort to improve the quality of baseline information needed for marine mammal stock assessments. The Marine Mammal Commission recommends that the Bureau of Ocean Energy Management continue to support broad-scale, multi-year, seasonal wildlife surveys in all areas of established or proposed energy development.

All survey methods have shortcomings, and using complementary survey methods is the best way to minimize those shortcomings. Aerial and ship surveys are limited by daylight, sea state, and weather conditions, and depend on the availability of survey platforms (ships and planes) and trained personnel. To complement the surveys being conducted as part of the Atlantic Marine Assessment Program for Protected Species, the Bureau also should be supporting broad-scale, year-round acoustic monitoring of marine mammals and ambient sound levels in the proposed leasing area. Fixed acoustic recorders deployed year-round in the offshore waters of North Carolina would fill data gaps resulting from infrequent, incomplete, or otherwise limited visual surveys. Fixed passive acoustic recorders can detect vocalizing marine mammals by species in all seasons and sea states, 24 hours a day, over a longer time frame and at a lower cost than visual surveys or even mobile, towed arrays (Clark 1995, Mellinger et al. 2007). Acoustic recordings have been used to estimate the abundance and, in some cases, the density of certain marine mammals (Van Parijs et al. 2002, Barlow and Taylor 2005, Marques et al. 2009). Fixed recorders also can be used to measure underwater ambient sound levels (Roth et al. 2012), which is critical for establishing baseline sound levels prior to the introduction of additional sound sources. For all these reasons, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management work with the National Marine Fisheries Service, marine mammal researchers, and other federal and state government agencies as appropriate, to deploy an array of fixed passive acoustic recorders across the proposed leasing area to measure the ambient sound field, the presence of various marine mammals, and changes that may occur as a result of wind energy development in the area.

Guidelines for biological surveys

The Bureau and the regulated industry must share in the responsibility for collecting the data needed to assess the potential impacts of renewable energy development. Clear and consistent guidelines should be provided as soon as possible to potential lessees regarding the types of biological and environmental information they should collect, how it should be collected, and the disposition of that information. Having this information in advance of the Bureau's proposed lease issuance will give lessees a clear idea of the types of data they must collect. Adherence to these guidelines will enhance the Bureau's ability to assess and minimize the effects of renewable energy activities. The University of Rhode Island and Pacific Energy Ventures have recently developed protocols for collecting baseline information and monitoring effects of renewable energy activities, under contract to the Bureau. Those protocols should provide the Bureau with a framework for the

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development of biological and environmental survey guidelines appropriate for lessees' collection of baseline information and for monitoring the effects of renewable energy activities. Guidelines for lessees must specify not only the type of information needed prior to and during site assessments, but also a system for compiling, archiving, and accessing survey and observer data. Such a system would facilitate the integration of the collected data with other broad-scale survey efforts, such as the Atlantic Marine Assessment Program for Protected Species and broad-scale passive acoustic monitoring.

To ensure that proper guidance is available to lessees on the collection of biological and environmental data, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management work with the National Marine Fisheries Service, the Fish and Wildlife Service, the Marine Mammal Commission, and other federal and state agencies as appropriate, to finalize the biological survey guidelines before the Bureau issues wind energy leases. The Commission further recommends that the Bureau ensure that its biological survey guidelines specify not only the type of information needed prior to and during site assessments, but also a system for compiling, archiving, and accessing such data.

The Commission hopes that you find these recommendations and comments helpful. Please contact me if you have questions or if the Commission can be of assistance as you consider these matters.

Sincerely,



Timothy J. Ragen, Ph.D.
Executive Director

cc: Ms. Helen Golde, National Marine Fisheries Service
Ms. Diane Bowen, Fish and Wildlife Service

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