



# MARINE MAMMAL COMMISSION

11 August 2011

Ms. Maureen Bornholdt  
Program Manager  
Office of Offshore Alternative Energy Programs (MS 4090)  
Bureau of Ocean Energy Management, Regulation, and Enforcement  
381 Elden Street  
Herndon, Virginia 20170-4817

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, Regulation, and Enforcement's draft environmental assessment on Commercial Wind Lease Issuance and Site Characterization Activities on the Atlantic Outer Continental Shelf Offshore New Jersey, Delaware, Maryland, and Virginia and associated 12 July 2011 *Federal Register* notice (76 Fed. Reg. 40925). The Commission offers the following recommendations and rationale.

## RECOMMENDATIONS

The Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement—

- continue its proactive and collaborative approach for identifying specific leasing areas for wind energy development;
- select Alternative D as the preferred alternative for leasing of wind energy areas in the mid-Atlantic to minimize the likelihood of noise-related injuries and vessel strikes to marine mammals, particularly the highly endangered right whale, from activities associated with site characterization and assessment;
- work with lessees to ensure the availability of adequate baseline information before moving forward with wind energy site characterization and assessment projects;
- require lessees to apply mitigation measures to reduce the effects of vessel activities on marine mammal species, including those that are and are not listed under the Endangered Species Act;
- also require the use of passive acoustic monitoring to increase protection of marine mammals during geophysical surveys;
- require lessees to estimate the proposed exclusion and buffer zones for all sound sources using operational- and site-specific information and the relevant thresholds established by the National Marine Fisheries Service, and modify those zones as necessary using in-situ sound measurements;
- use exclusion zones to protect both listed and non-listed marine mammals;
- require lessees to immediately report all injuries or mortalities of both listed and non-listed marine mammals and suspend their activities if a marine mammal is seriously injured or killed and the injury or death could have been caused by their activities, and then consult with the National Marine Fisheries Service and the Marine Mammal Commission to

- determine the cause of the injury or death and devise means for avoiding such impacts before operations resume;
- allow lessees to resume to full power for geophysical surveys only when the shutdown has been eight minutes or less in duration, and when no marine mammals have been observed within the exclusion zone before or during the shutdown or when a marine mammal is seen within the exclusion zone but also is observed leaving the zone;
- require lessees to cease pile driving if a marine mammal has entered the exclusion zone around a pile driving operation until the marine mammal is observed to have left the exclusion zone or has not been seen or otherwise detected within the exclusion zone for 15 minutes in the case of small odontocetes and 30 minutes in the case of mysticetes and large odontocetes;
- require that any alternative monitoring methods used during pile driving or other activities be clearly specified so that a determination can be made as to the effectiveness and adequacy of that alternative method;
- encourage lessees to use acoustical monitoring to characterize ambient sound levels before, during, and after proposed activities and to monitor for the presence and movements of cetaceans in the vicinity of specific proposed wind energy areas; and
- provide a comprehensive analysis of the cumulative impacts of wind energy development and other human activities that affect the development area.

## **RATIONALE**

### **A proactive and collaborative approach to leasing**

The Bureau has identified five alternatives for leasing of wind energy areas in the mid-Atlantic. Those areas are located offshore of New Jersey, Delaware, Maryland, and Virginia beginning at 13 to 33 km from shore and extending eastward 50 to 98 km. The size and location of those areas were determined with input from federal, state, and local agencies and potential developers. The Bureau should be commended for its proactive and collaborative approach for identifying specific lease areas, which should help reduce future conflicts over use of space and environmental impacts. Such an approach is consistent with the President's National Ocean Policy and promotes more realistic leasing scenarios, more targeted data collections and surveys, and better assessment of environmental risk. The Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement continue its proactive and collaborative approach for identifying specific leasing areas for wind energy development.

### **Analysis of alternatives**

The Bureau prefers Alternative A, which would open for commercial and research wind leasing about 85 whole and 57 partial blocks comprising the entire area identified off each state. Alternative B would accommodate the U.S. Coast Guard by removing from consideration an unofficial anchorage area about one-half block in size offshore of Delaware Bay. Alternative C would remove the equivalent of almost 10 blocks from consideration in areas off Maryland. The

U.S. Coast Guard has determined that those areas require further study because of existing vessel traffic and expected increases in traffic in the foreseeable future. Alternative D would retain all areas for leasing, but would prohibit surveys, construction, and decommissioning of meteorological towers and buoys in all areas during migration of North Atlantic right whales (November to April). Alternative E would exclude eight blocks in the Virginia wind energy area because of concerns regarding navigational safety. Alternative F is the no action alternative. The analysis for each alternative includes reasonably foreseeable scenarios for leasing, site characterization, and site assessment, including shallow hazard, geological, geotechnical, archaeological, and biological surveys.

Selection among these alternatives requires a careful analysis and weighing of the risks involved. The areas under consideration for wind energy leasing provide habitat for a great diversity of marine life. At least 37 species of marine mammals have been documented off the mid-Atlantic and northeast United States (Waring et al. 2010), including eight endangered whale species, other large and small cetaceans, and pinnipeds. These areas also are important habitat for endangered and threatened sea turtles, seabirds, and commercially valuable fish stocks.

The activities required for wind energy development in the mid-Atlantic pose a variety of risks to marine mammals. Impacts on marine mammals from sub-bottom profilers used for geophysical surveys and sub-bottom sampling have not been characterized. However, these sources generate sound source levels (201–205 dB re 1 $\mu$ Pa at 1 m) and frequencies (0.5–24 kHz) comparable to other sound sources that 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). Pile driving for construction of meteorological towers 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. Increased vessel activity associated with construction of meteorological towers and the deployment of meteorological buoys may contribute to disturbance and increase the risk of vessel collisions with marine mammals (Laist et al. 2001).

The Bureau has proposed marine mammal and sea turtle mitigation and monitoring measures to address the risks associated with development activities (described in detail below). For example, the mid-Atlantic areas under consideration overlap with the migratory corridor for right whales and activities during this period and in these areas would pose an increased risk of vessel strikes to these and other large whales (see Knowlton et al. 2002, Firestone et al. 2008). This risk would be mitigated to a degree by a measure already in place. In October 2008 the Service implemented seasonal speed restrictions in the mid-Atlantic and other areas to reduce the risks of whale-vessel collisions (73 Fed. Reg. 60173). The regulations restrict vessels greater than or equal to 19.8 m from travelling at speeds greater than 10 knots from 1 November through 30 April within a 37-km radius of the entrance of several mid-Atlantic ports, including the entrance to Delaware Bay and the Chesapeake Bay. These areas overlap with the western edge of the proposed wind energy areas off Delaware, Maryland, and Virginia. However, they do not provide protection for the full mid-Atlantic area under consideration for wind energy development.

Alternative D is the only alternative that provides additional protection for marine mammals. It would provide full protection during the November to April period when right whales are migrating southward, when they are on their reproductive grounds, and when they are migrating northward to their feeding grounds. This additional protection appears to be necessary because an analysis by Schick et al. (2009) indicates that right whales occur at least 55 km offshore in the mid-Atlantic, which would mean that the 2008 restrictions are helpful but insufficient to protect right whales throughout the proposed leasing area. Alternative D also would protect other cetacean species in this area (e.g., bottlenose dolphins, common dolphins, harbor porpoise, fin whales, and humpback whales; Geo-Marine Inc. 2010; Waring et al. 2010). In particular, short-beaked common dolphins and harbor porpoises occur in the proposed wind energy area off New Jersey in the winter and spring when temporal restrictions under Alternative D would be in effect (Geo-Marine Inc. 2010).

The added protection under Alternative D should not impose an excessive cost because the Bureau has indicated in the environmental assessment that weather and sea conditions would limit development activities to the period from April to August. If that is the case, then a formal, precautionary restriction on activities during this period should not add appreciably to development costs. Therefore, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement select Alternative D as the preferred alternative for leasing of wind energy areas in the mid-Atlantic to minimize the likelihood of noise-related injuries and vessel strikes to marine mammals, particularly the highly endangered right whale, from activities associated with site characterization and assessment.

### **Guidelines for biological surveys**

The Marine Mammal Commission supports the development of wind energy as a means of meeting the nation's energy needs with less risk to the environment. Wind energy is undoubtedly safer in a number of important respects. That being said, the impacts of wind-generated energy on the marine environment are not well studied and should be characterized to ensure that lessees do not overlook potentially important impacts.

An evaluation of the potential impacts of wind energy development on marine mammals and their habitats depends on the availability of good baseline information. That information should be sufficient to identify and avoid potential harmful interactions with sensitive populations (e.g., those listed as threatened or endangered under the Endangered Species Act or depleted under the Marine Mammal Protection Act) and impacts on particularly sensitive areas (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 affected ecosystems. For potentially affected marine mammals, the necessary information includes their stock structure, population status, abundance and trends, distribution and seasonal movements, habitat use patterns, and trophic relationships. Indeed, the collection of baseline information requires a 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.

The Bureau's Environmental Studies Program, in collaboration with the Navy, has committed to providing multi-year funding to the National Marine Fisheries Service for the Atlantic Marine Assessment Program for Protected Species. This program will support a broad-scale, multi-year data collection of abundance and seasonal distribution data for marine mammals and other wildlife in the U.S. Atlantic. The Commission commends this joint effort as it will improve the quality of baseline information needed for assessments of marine mammal stocks and, for that reason, should be a high priority for the Bureau in all established or proposed energy development areas.

In April 2011 the Bureau issued guidelines for shallow hazard surveys, geological surveys, geotechnical surveys, and archaeological resource surveys required for development. It did not include guidelines for biological surveys, although lessees also must submit the results of those surveys with their construction and operation plans. The Commission understands that the Bureau is in the process of developing those guidelines and provided comments on a draft version in March 2011. The Commission requests an opportunity to review and provide comments on future drafts to facilitate their completion. Clear and comprehensive guidelines should help the Bureau avoid significant gaps in baseline information.

All that being said, having adequate guidelines in place will not ensure that the appropriate data have been collected. If the development activities are to be guided by well-informed decisions, collection of such data will require time to survey the areas, compile and analyze the collected data, and report the results. To that end, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement work with lessees to ensure the availability of adequate baseline information before moving forward with wind energy site characterization and assessment projects.

### **Mitigation, monitoring, and reporting**

The Bureau has proposed mitigation, monitoring, and reporting measures to minimize or eliminate potential impacts to whales and sea turtles listed under the Endangered Species Act. These include measures that would reduce impacts associated with vessel activities, such as compliance with vessel strike reduction regulations for North Atlantic right whales (50 CFR § 224.105); requirements for protected species observers to keep watch for marine mammals and sea turtles; vessel approach regulations for right whales (50 CFR § 224.103); regional viewing guidelines for whales, small cetaceans, and sea turtles; requirements for pilots to maintain minimum altitudes and avoid noise-sensitive areas; and briefing of personnel regarding marine trash and debris in offshore areas. Lessees also would be required to abide by specific mitigation measures for activities associated with site characterization and assessment.

The Bureau's proposed mitigation measures for reducing impacts from vessel activities (section C.1.1) on species listed under the Endangered Species Act are generally appropriate and consistent with current guidelines and regulations. However, these measures should apply to all marine mammals instead of only those listed as threatened or endangered. As such, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement require lessees to apply mitigation measures to reduce the effects of vessel activities on marine mammal species, including those that are and are not listed under the Endangered Species Act.

The measures proposed for pre-construction site characterization surveys (C.1.2) and construction of meteorological towers and installation of meteorological buoys (C.1.3) should be revised to include the use of exclusion and buffer zones, procedures to follow in the event of an injury or mortality, and visual monitoring requirements. Because a number of mitigation and monitoring methods are based on visual observations that are often limited in effectiveness, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement also require the use of passive acoustic monitoring to increase protection of marine mammals during geophysical surveys.

Exclusion zones normally are intended to protect marine mammals that are close enough to a sound source to be injured (i.e., Level A harassment) or killed by exposure to the sound. Buffer zones are used to delineate the area in which Level B harassment may occur and to estimate the number of marine mammals that may be taken. The Bureau has proposed a 500-m exclusion zone for high-resolution site surveys, a 200-m exclusion zone for sub-bottom profiling, and a 1000-m exclusion zone for pile driving. Exclusion zones would apply only to marine mammals listed under the Endangered Species Act. A buffer zone of 7 km would be monitored for pile driving. Monitoring of buffer zones is a standard measure for all other sound sources. However, it is not clear whether the lessee would be required to monitor the 7-km buffer zone for pile driving and, if so, how the lessee would do so effectively.

The methods used to estimate the exclusion zones appear to be based on modeling conducted for the Cape Wind project (see reference to exclusion zones on p. 81), but those methods are not consistent with the exclusion zones identified in Appendix C and may not be appropriate for the sound generating activities that may occur in the proposed wind energy areas. The Bureau and the lessee should estimate exclusion and buffer zones using either empirical measurements relevant to the particular survey site or using a model that takes into account the conditions in the proposed survey area. The model should incorporate operational parameters (e.g., source level and type) and site-specific environmental parameters (e.g., sound speed profiles, surface ducts, wind speed, bathymetry, and water depth). The Bureau should require lessees to collect in-situ sound measurements to verify and, if need be, refine the exclusion and buffer zones. In addition, the Bureau did not estimate the exclusion or buffer zones associated with other potential sound sources, such as vibratory pile driving and the dynamic position of the vessel associated with borehole drilling. Those activities emit a continuous, rather than impulsive, sound signal, and to manage them the Bureau should require the use of a 120-dB re 1  $\mu$ Pa threshold established by the National Marine

Fisheries Service for continuous sound sources when estimating buffer zones. For all these reasons, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement require lessees to estimate the proposed exclusion and buffer zones for all sound sources using operational- and site-specific information and the relevant thresholds established by the National Marine Fisheries Service, modify those zones as necessary using in-situ sound measurements, and describe how the lessee would monitor those zones effectively. The Marine Mammal Commission further recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement use exclusion zones to protect both listed and non-listed marine mammals.

The Bureau indicated that lessees would be required to report all injuries or mortalities of Endangered Species Act-listed marine mammals within 24 hours to the Bureau and the National Marine Fisheries Service. The Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement require lessees to immediately report all injuries or mortalities of both listed and non-listed marine mammals and suspend its activities if a marine mammal is seriously injured or killed and the injury or death could have been caused by its activities. The Bureau should then consult with the National Marine Fisheries Service and the Marine Mammal Commission to determine the cause of the injury or death and devise means for avoiding such impacts before operations resume.

The Bureau would require the use of ramp-up procedures when active sources are shutdown for a period greater than 20 minutes. Shutdowns that do not exceed 20 minutes would not require ramp-up procedures: instead, the lessee could restart the active source at full power. Twenty minutes is a relatively long period and the longer the period, the more likely that a marine mammal may move into an exposure zone while the array is silent. Because the implications of such a long pause are uncertain but the risks increase with time, other geophysical surveys have been limited to delays of eight minutes before they must use ramp-up procedures, and then only under certain circumstances. Those circumstances include an equipment failure that is fixed quickly when no marine mammals have been observed within the exclusion zone before or during the failure, or when a marine mammal is seen within the exclusion zone but is observed leaving the exclusion zone. Resumption to full power after the abbreviated timeframe may be reasonable in those specific circumstances but may pose an unacceptable level of risk in others. As a precautionary measure, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement allow lessees to resume to full power for geophysical surveys only when the shutdown has been eight minutes or less in duration, and when no marine mammals have been observed within the exclusion zone before or during the shutdown or when a marine mammal is seen within the exclusion zone but also is observed leaving the zone. This limit warrants further study and verification, but is at least consistent with the measures used to manage other geophysical surveys.

The Bureau has noted that once driving of a pile begins it cannot be stopped until that pile has reached its predetermined depth—that is, pile driving would continue even if a marine mammal enters the exclusion zone. This is not consistent with other projects involving pile driving activities,

and could cause harm to marine mammals that remain in the exclusion zone during continued pile driving. The Bureau also indicates that an “alternative monitoring method” would be used by the lessee for pile driving during night hours or when the safety radius cannot be adequately monitored. However, the Bureau did not describe what that alternative would be or the basis for concluding that it would be effective. The Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement require lessees to cease pile driving if a marine mammal has entered the exclusion zone around a pile driving operation until the marine mammal is observed to have left the exclusion zone or has not been seen or otherwise detected within the exclusion zone for 15 minutes in the case of small odontocetes and 30 minutes in the case of mysticetes and large odontocetes. The Marine Mammal Commission further recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement require that any alternative monitoring methods used during pile driving or other activities be clearly specified so that a determination can be made as to the effectiveness and adequacy of that alternative method.

The use of passive acoustic monitoring systems has become a standard mitigation measure for projects (e.g. military exercises, oil and gas development, and geophysical surveys) that generate sound and are located in areas that overlap important marine mammal habitat. As previously noted, passive acoustic monitoring could be used to provide information on the seasonal presence, relative abundance, and movements of cetaceans in the vicinity of specific proposed wind energy areas. It also can be used to determine the sound “footprint” of the leasing site before, during, and after survey and construction activities and during operations and decommissioning. Therefore, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement require lessees to use acoustical monitoring to characterize ambient sound levels before, during, and after proposed activities and to monitor for the presence and movements of cetaceans in the vicinity of specific proposed wind energy areas.

### **Cumulative impacts**

Wind energy development is not the only human-related factor that could affect marine fish and wildlife in the proposed action area. The environmental assessment in the notice included only a cursory analysis of the cumulative impacts of wind energy development, with no substantial analysis of the combined impacts of wind energy development; fisheries; commercial shipping; tourism; contaminant and nutrient run-off from shore-based and inland industry, agriculture, and residential developments; military activities; and climate disruption. Climate disruption, in particular, may alter the physical, biological, and chemical environment, perhaps dramatically, during the lifetime of any wind energy development activity in this region. The Bureau’s analysis of cumulative impacts must be rigorous enough to determine if, when, and where marine resources, including marine mammals, are being exposed to cumulative impacts that hinder their potential to grow and recover. Therefore, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management, Regulation, and Enforcement provide a comprehensive analysis of the cumulative impacts of wind energy development and other human activities that affect the development area.

Ms. Maureen Bornholdt  
11 August 2011  
Page 9

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: Mr. James H. Lecky, National Marine Fisheries Service  
Ms. Mary Colligan, National Marine Fisheries Service  
Ms. Lisa Lierheimer, Fish and Wildlife Service

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Ms. Maureen Bornholdt  
11 August 2011  
Page 10

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