



MARINE MAMMAL COMMISSION

2 August 2012

Ms. Maureen Bornholdt
Program Manager
Office of Renewable Energy Programs
Bureau of Ocean Energy Management
381 Elden Street (HM 1328)
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's draft environmental assessment on Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore Rhode Island and Massachusetts and associated 3 July 2012 notice requesting comments (77 Fed. Reg. 39508). The Commission offers the following recommendations and rationale.

RECOMMENDATIONS

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

- expand its proposed mitigation and monitoring measures to ensure right whales and other marine mammals are protected throughout the leasing area rather than exclude specific blocks from leasing as proposed in alternative B;
- prohibit high resolution geophysical surveys as well as pile driving throughout the leasing area from 1 November to 30 April;
- prohibit high resolution geophysical surveys and pile driving during times when the National Marine Fisheries Service has implemented a Dynamic Management Area restriction within or adjacent to the leasing area;
- continue to support seasonal 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;
- 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;
- 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;

- provide more realistic species-specific take estimates associated with each proposed sound source, and include confidence limits and sources of potential bias associated with each take estimate;
- incorporate additional mitigation and monitoring measures to minimize takes associated with high resolution geophysical surveys and pile driving, as outlined below;
- require, as a term and condition for approval of site assessment activities, that applicants obtain authorization, as appropriate, under section 101(a)(5)(A) or (D) of the Marine Mammal Protection Act to take small numbers of marine mammals incidental to those activities; such approval also should stipulate minimum requirements for mitigation, monitoring, and reporting, as specified in the Bureau's standard operating conditions;
- revise the size of its estimated exclusion zones to ensure they encompass the Level B harassment zones (i.e., out to 160 or 120 dB re 1 μ Pa, as appropriate), as calculated for each sound source;
- require wind energy lessees to estimate the proposed exclusion zones for all sound sources using operation- 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;
- require lessees to monitor exclusion zones for both listed and non-listed marine mammals;
- 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 pinnipeds and 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; and
- include acoustic monitoring as a standard operating condition for lessees to characterize ambient sound levels before, during, and after proposed activities and to monitor for the presence and movements of cetaceans during site assessment and pile driving activities.

RATIONALE

Analysis of alternatives

The Bureau has proposed several alternative areas for wind energy leases and site assessment activities. Its preferred alternative (alternative A) would include all of the wind energy area offshore Rhode Island and Massachusetts. Alternative B would exclude certain blocks to minimize interactions with endangered North Atlantic right whales. Alternatives C and D would exclude areas from the Massachusetts coastline out to approximately 28 km (15 nmi) and 39 km (21 nmi), respectively, to avoid potential impacts on visual and cultural resources. Alternative E would exclude areas with potential impacts on telecommunication cables. The analysis for each alternative includes reasonably foreseeable scenarios for site characterization surveys, including geophysical, geological, archaeological, and biological surveys, as well as the collection of meteorological data from towers or buoys.

The areas under consideration provide habitat for a great diversity of marine life. The Bureau reports that at least 30 species of marine mammals are known to occur within the project area, including six 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 off Rhode Island and Massachusetts 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 well studied or characterized. These sources generate sound levels (213-229 dB re 1 μ Pa at 1 m) and frequencies (0.2–400 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). Effects may not be detected unless the affected marine mammals strand, which often leads to mortality. Scientists have conducted some preliminary modeling exercises and studies with captive animals (Wood et al. 2012), but these studies are not sufficient to conclude with confidence that these technologies pose minimal risk to marine mammals. 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 cause 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 would increase the risk of vessel strikes on marine mammals (Laist et al. 2001).

As noted above, alternative B would exclude from leasing and site assessment activities certain blocks within the proposed leasing area that the Bureau has determined are part of the North Atlantic right whale's migration corridor and that also may be feeding areas. However, the Bureau's rationale for selecting the designated blocks is not clear. It cites the Rhode Island Ocean Special Area Management Plan as the source of aggregated sighting, stranding, and bycatch data for right whales and other species. That document indicates that right whales occur throughout the proposed leasing area, especially in the spring during their northward migration (Kenney and Vigness-Raposa 2010). Sightings data collected in 2011 support this conclusion (Figure 1). Sightings of large aggregations of right whales feeding off Rhode Island in April 1998 and April 2010 did not appear to be associated with any particular bathymetric or oceanographic features within the leasing area, as animals were observed throughout the area (Figure 1; Kenney 2010). In the absence of more definitive information indicating that right whales or other marine mammals aggregate in specific blocks, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management expand its proposed mitigation and monitoring measures to ensure right whales and other marine mammals are protected throughout the leasing area rather than exclude specific blocks from leasing as proposed in alternative B.

To that end, the Bureau has proposed a seasonal prohibition of pile driving activities to avoid the potential for disturbance of North Atlantic right whales during their spring migration through the leasing area. The prohibition would be in effect from 1 November through 30 April, when ship speeds are restricted in the Block Island Seasonal Management Area (50 CFR § 224.105).

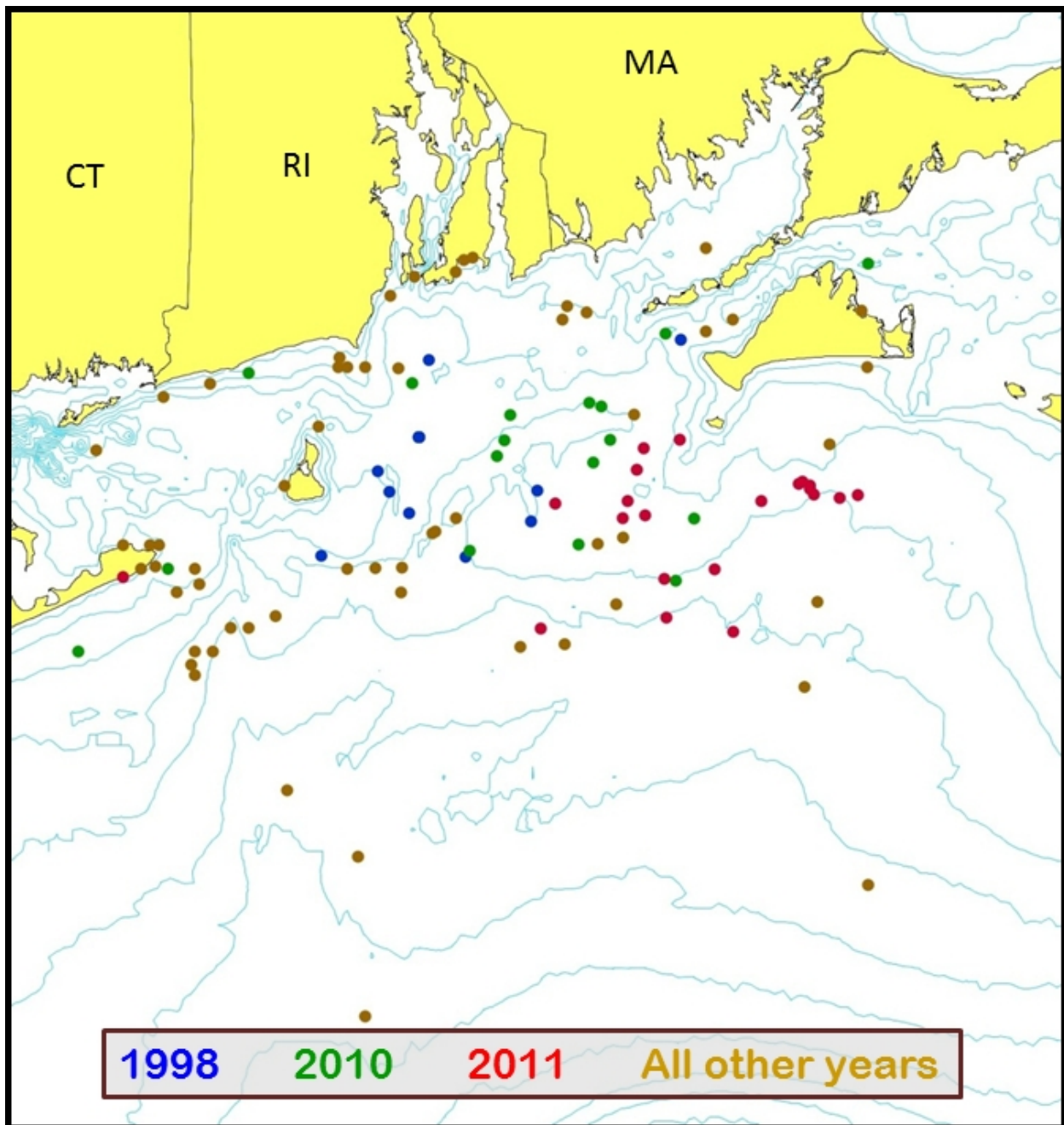


Figure 1: Right whale sightings within and adjacent to the leasing area, as reported to the North Atlantic Right Whale Consortium (Courtesy R. Kenney, University of Rhode Island).

As noted above, high resolution geophysical surveys also have the potential to disturb right whales and other marine mammals traveling through or feeding in the area. To avoid disturbance of migrating or feeding right whales by all sound sources, not just pile driving, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management prohibit high resolution geophysical surveys as well as pile driving throughout the leasing area from 1 November to 30 April. The Marine Mammal Commission further recommends that the Bureau prohibit high resolution

geophysical surveys and pile driving during times when the National Marine Fisheries Service has implemented a Dynamic Management Area restriction within or adjacent to the leasing area. The National Marine Fisheries Service posts information regarding the location and duration of Dynamic Management Areas on its website at www.nmfs.noaa.gov/pr/shipstrike.

Adequacy of existing information

The Marine Mammal Commission supports the development of wind energy to meet the nation's energy needs. Wind energy development undoubtedly is safer and more sustainable over the long term than the production and use of non-renewable resources such as fossil fuels. That being said, the impacts on the marine environment of activities and structures associated with wind energy generation are not well studied and the proposed actions provide an excellent opportunity to characterize, measure, and assess any potentially important impacts early in the development process.

A thorough evaluation of the potential impacts of wind energy development depends on the availability of biological and environmental information collected prior to and during leasing activities. That 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. 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 reproduction or recruitment rates. An ecosystem-based management approach requires additional information on habitat-use patterns and trophic relationships. Other key environmental variables include ambient noise 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 30 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 individual 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 seasonal broad-scale, multi-year 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 noise levels in the proposed leasing area. Fixed acoustic recorders deployed year-round across the proposed leasing area 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, 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 of certain odontocetes (Van Parijs et al. 2002, Barlow and Taylor 2005) and, under certain conditions, have also been used to estimate the density of marine mammals in a given area (Marques et al. 2009). Fixed recorders also can be used to measure underwater ambient noise (Roth et al. 2012), which is critical for establishing baseline noise 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.

Guidelines for biological surveys

The Bureau and the regulated industry must share 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. Protocols for collecting baseline information and monitoring effects of renewable energy activities have recently been drafted by the University of Rhode Island and Pacific Energy Ventures, under contract to the Bureau. Those protocols should provide the Bureau with a framework for the 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 such data with other, more 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.

Accounting for potential takes

The Bureau's draft environmental assessment includes no take estimates for marine mammals because the Bureau expects that its proposed mitigation and monitoring measures will avoid all takes. To avoid takes associated with high resolution geophysical surveys, it is proposing to establish and monitor an exclusion zone that would encompass both the Level A and Level B zones, with associated start up and shutdown requirements. The Commission commends the Bureau for its efforts to develop a monitoring approach that attempts to avoid all takes of marine mammals associated with high resolution geophysical surveys. However, it is not realistic to expect that all animals approaching or entering the exclusion zone would be detected by visual monitoring. Even under the best visibility conditions, not all marine mammals in an area will be detected because (1) marine mammals spend part of their time underwater (availability bias) and (2) not all animals that are at the surface will be seen by observers (perception bias) (Marsh and Sinclair 1989). The latter can be compensated, in part, by using additional observers; however, the Bureau has proposed to use only one observer to monitor exclusion zones that could be as large as four km in diameter.¹

It is also not realistic to expect that no takes would occur from pile driving. The Bureau has stated that it would not require pile driving to stop even if a marine mammal enters the exclusion zone. This is not consistent with other wind energy projects involving pile driving activities (Fishermen's Atlantic City Windfarm, LLC proposed wind energy farm, 77 Fed. Reg. 14736), and would result in takes of marine mammals that remain in the exclusion zone during continued pile driving. Given the limitations of the Bureau's proposed mitigation and monitoring measures for both high resolution geophysical surveys and pile driving, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management provide more realistic species-specific take estimates associated with each proposed sound source, and include confidence limits and sources of potential bias associated with each take estimate. The Marine Mammal Commission further recommends that the Bureau of Ocean Energy Management incorporate additional mitigation and monitoring measures to minimize takes associated with high resolution geophysical surveys and pile driving, as outlined below.

Standard operating conditions for protected species (mitigation, monitoring, and reporting)

The proposed wind energy related activities have the potential to take marine mammals by Level A or Level B harassment, as defined under the Marine Mammal Protection Act. The Bureau

¹ Based on uncorrected estimated ranges for Level A and B harassment of cetaceans by electromechanical sources provided in Table C-5 of the Bureau of Ocean Energy Management's draft Programmatic Environmental Impact Statement for Atlantic Outer Continental Shelf proposed geological and geophysical activities (BOEM 2012-005, March 2012).

has proposed standard operating conditions that will be required of all lessees to avoid impacts on marine mammals and sea turtles. 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; and briefing of personnel regarding marine trash and debris awareness in offshore areas.

The Bureau has also proposed standard operating conditions specific to each type of proposed action that has the potential to take marine mammals—high resolution geophysical surveys (B.3), geotechnical sampling (B.4), and construction of meteorological towers and installation of meteorological buoys (B.5)—each with its own requirements for the establishment and visual monitoring of exclusion zones to avoid any Level A or Level B takes. Operators conducting those surveys are required to seek authorization from the National Marine Fisheries Service under section 101(a)(5)(A) or (D) of the Marine Mammal Protection Act to take small numbers of marine mammals incidental to those activities. The Bureau has not been consistent in its guidance to applicants regarding compliance with the Marine Mammal Protection Act, and this has led to confusion and litigation with respect to seismic surveys. To avoid confusion for applicants seeking approval for wind energy-related activities in the project area, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management require, as a term and condition for approval of site assessment activities, that applicants obtain authorization, as appropriate, under section 101(a)(5)(A) or (D) of the Marine Mammal Protection Act to take small numbers of marine mammals incidental to those activities; such approval also should stipulate minimum requirements for mitigation, monitoring, and reporting, as specified in the Bureau's standard operating conditions.

As stated above, the Bureau intends to avoid all marine mammal takes by monitoring out to the edge of the Level B harassment zone. However, as discussed with the Bureau, the proposed exclusion zones do not encompass the 160-dB zone for high resolution geophysical sound sources, as identified in Table 4-7 of the environmental assessment (page 110). It is the Commission's understanding that the Bureau will amend the exclusion zones accordingly. The zones also would not avoid takes from non-impulsive sound sources, such as shallow-penetration sub-bottom profilers (chirps), drilling, and dynamic positioning thrusters. The National Marine Fisheries Service clarified recently that for non-impulsive sound sources (whether continuous or intermittent), Level B harassment is presumed to begin at received levels of 120 dB re 1 μ Pa (76 Fed. Reg. 43639). The Marine Mammal Commission recommends that the Bureau of Ocean Energy Management revise the size of its estimated exclusion zones to ensure they encompass the Level B harassment zones (i.e., out to 160 or 120 dB re 1 μ Pa, as appropriate), as calculated for each sound source.

Received sound levels expected from the proposed activities are uncertain. Therefore, lessees should verify, by in-situ sound measurements, the size of the exclusion and harassment zones for all sound sources that have the potential to take marine mammals. Verifying in-situ sound measurements would ensure that they incorporate equipment-specific operational parameters (e.g., actual source level and type) and site-specific environmental parameters (e.g., sound speed profiles, surface ducts, wind speed, bathymetry, and water depth). In-situ sound measurements also would

contribute to a better understanding of received sound levels from various sound sources in a variety of environmental conditions. Consistent with past recommendations, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management require wind energy lessees to estimate the proposed exclusion zones for all sound sources using operation- 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 Commission further recommends that the Bureau require lessees to monitor exclusion zones for both listed and non-listed marine mammals.

As noted above, the Bureau has indicated 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. The Bureau indicated also 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. To minimize takes associated with proposed pile driving activities, the Marine Mammal Commission recommends that the Bureau of Ocean Energy Management 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 pinnipeds and 30 minutes in the case of mysticetes and large odontocetes. To determine the effectiveness and adequacy of alternative monitoring methods, the Commission further recommends that the Bureau require that any alternative monitoring methods used during pile driving or other activities be clearly specified.

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. This is especially important given the limited effectiveness of visually monitoring relatively large exclusion and harassment zones. As noted previously, passive acoustic monitoring could be used to provide information on the seasonal presence, relative abundance, and movements of cetaceans in the vicinity of the proposed wind energy area. 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 include acoustic monitoring as a standard operating condition for lessees to characterize ambient sound levels before, during, and after proposed activities and to monitor for the presence and movements of cetaceans during site assessment and pile driving activities.

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. Michael Payne, National Marine Fisheries Service
Ms. Mary Colligan, National Marine Fisheries Service

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