MARINE MAMMAL COMMISSION

22 January 2016

Mr. James F. Bennett, Chief
Office of Renewable Energy Programs
Bureau of Ocean Energy Management
45600 Woodland Road, VAM-OREP
Sterling, Virginia 20166

Dear Mr. Bennett:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Bureau of Ocean Energy Management's (BOEM) 25 November 2015 notices calling for information and nominations (80 Fed. Reg. 73818) and indicating its intent to prepare an environmental assessment for commercial wind leasing and site assessment activities on the Atlantic Outer Continental Shelf (OCS) offshore South Carolina (80 Fed. Reg. 73817). 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.

Impacts associated with the entire life cycle of wind energy development

The Commission supports BOEM's efforts to develop offshore renewable energy, including wind energy. However, the Commission remains concerned that BOEM intends to limit the evaluations in its environmental assessments to impacts associated with lease issuance and site assessment, rather than the full life cycle of wind energy activities from site assessment through construction, operation, and decommissioning. In light of the considerable efforts underway to develop wind energy resources in U.S. Atlantic state and OCS waters, particularly in waters that provide important habitat for North Atlantic right whales and other marine mammals, BOEM's leasing decisions should be guided by an analysis of information regarding impacts associated with the full life cycle of wind energy activities as well as the cumulative impacts of wind energy activities in the Atlantic OCS, in the context of other human uses of the marine environment (Masden et al. 2009, Thompson et al. 2013, Rice et al. 2014). Such an analysis could help identify data gaps and guide future research, mitigation, and monitoring requirements at the early stages of wind energy development. Accordingly, the Commission recommends that BOEM include in its environmental assessment an updated analysis of the potential effects of the full life cycle of commercial wind energy activities (site assessment, construction, operation, maintenance, and decommissioning) in the Atlantic OCS, including new information on the longer-term and cumulative effects of wind energy activities on marine mammals, their habitats, and their prey species.

Risks to marine mammals

The following is a summary of potential risks to marine mammals from site assessment, construction, operation, and maintenance of wind energy facilities that should be considered in BOEM's environmental assessment—

- Echosounders used for geophysical surveys and site characterization generate source levels comparable to other sound sources that may result in behavioral disturbance (Deng et al. 2014) and may lead to more serious consequences (e.g., stranding; Southall et al. 2013).
- Pile driving for construction of meteorological towers and wind turbines generates broadband sound capable of masking marine mammal vocalizations (McIwem 2006). Sound generated by pile driving, particularly impact hammering, could impair hearing in marine mammals at close range (Madsen et al. 2006, Hastie et al. 2015) and lead to changes in behavior at intermediate distances, including temporary avoidance during construction activities (Brandt et al. 2011, Brasseur et al. 2012, Dähne et al. 2013).
- Vessel strikes represent a major source of mortality and injury for baleen whales, including those in the western North Atlantic (Glass et al. 2010, Waring et al. 2015). Increased vessel activity associated with high-resolution geological and geophysical surveys, construction of meteorological towers, deployment of meteorological buoys, and construction and maintenance of wind turbines will increase the risk of vessel strikes on large whales, including endangered North Atlantic right whales. Installed wind farms may alter vessel traffic patterns in ways that add to the risk of vessel strikes (e.g., forcing vessels into whale migration corridors).
- Pile driving and installation of transmission cables can temporarily or permanently disturb benthic habitat and prey species for marine mammals and may result in increased sedimentation and discharge of contaminants or debris which could affect water quality.
- Sound generated from wind turbine operations would generally be of low intensity, with energy concentrated at lower frequencies (below a few kHz; Tougaard et al. 2008). The sound from the turbines that is transmitted underwater will add to ocean sound levels during the lifetime of the wind farm. In some cases, harbor porpoise densities appear to be reduced near operating wind farms as compared to baseline (pre-construction) densities (Teilmann and Carstensen 2012, Nabe-Nielsen et al. 2014)
- Cables transmitting the energy from wind turbines to land-based facilities generate electromagnetic energy, which has the potential to affect certain fish (e.g., flatfish) that may be prey for marine mammals (Normandeau et al. 2011). Certain cables or cable configurations could also entangle marine mammals (Norman and Lopez 2002).

On the other hand, some marine mammals may benefit from wind farms. For example, the artificial reefs that turbines create will likely attract or concentrate certain benthic invertebrates and fishes (Lindeboom et al. 2011). Marine mammals such as harbor seals and harbor porpoise have been observed at higher densities around wind turbine structures compared to baseline densities, presumably to take advantage of the prey concentrations there (Lindeboom et al. 2011, Russell et al. 2014, Scheidat et al. 2011).

The majority of research to investigate the effects of wind turbine construction and operation has been conducted at European wind farms, which have documented impacts on harbor porpoises and harbor seals. However, because baleen whales and cetaceans that use mid-frequency sound are rarely observed in areas where wind farms have been constructed in Europe, no studies to date have focused on the possible impacts on them. An additional area where information for marine mammals is generally lacking is whether, and the extent to which, wind energy development reduces reproduction and survival (Boehlert and Gill 2010, Dolman and Simmonds 2010, Simmonds and Brown 2010, Bailey et al. 2014, Goodale and Milman 2014).

Including protections for North Atlantic right whales in BOEM's preferred alternative

As stated in previous comments to BOEM (see letters of 2 May 2014 and 23 Feb 2015[1]), the potential for full-scale wind farm development in North Atlantic right whale critical habitat is of significant concern to the Commission because of the population's small size and high mortality rate from human activities, namely shipping and fishing (Kraus et al. 2005). Sighting data and analyses indicate that right whales generally are coastal in distribution, at least during portions of their annual migration, with highest densities off South Carolina during the winter months in waters 10 to 25 m in depth (Gowan and Ortega-Ortiz 2014). The warm, shallow waters of the U.S. South Atlantic Bight[2] are preferred habitat for calving and nursing (Garrison 2007, Good 2008), and may provide protection from predation and other social benefits to juveniles (Hamilton and Cooper 2010). On 20 February 2015 (80 Fed. Reg. 9314), NMFS proposed an expansion of right whale critical habitat to include all waters offshore of South Carolina up to 28 m in depth. The Commission supported this proposed expansion (see letter of 21 April 2015).

A number of the potential risks to right whales from wind energy development could be avoided by restricting sound-generating activities and limiting vessel traffic during the season when right whale females and calves are known to be present (1 November through 30 April). This is the same timeframe for which NMFS designated seasonal management areas to protect right whales from vessel strikes in South Carolina coastal waters (50 CFR § 224.105). A seasonal restriction on site assessment and pile driving activities associated with wind energy development would reduce the likelihood of sound-related disturbance and vessel strikes. Therefore, the Commission recommends that BOEM include in its preferred alternative a restriction on all site assessment and pile driving activities off South Carolina from 1 November through 30 April to minimize impacts on North Atlantic right whales.

The seasonal restriction on site assessment and pile driving activities should be incorporated into leasing agreements as a standard operating condition. Other standard operating conditions that should be included to ensure adequate protection of right whales are those outlined in the environmental assessment for commercial wind lease issuance and site assessment activities on the Atlantic OCS off North Carolina (80 Fed. Reg. 3621). Those include vessel strike avoidance measures, deployment of protected species observers, establishment of exclusion zones in accordance with NMFS guidance regarding acoustic thresholds, implementation of ramp-up and power-down or shut-down procedures, operational restrictions during periods of low visibility, and reporting of all observations of protected species, including injured or dead animals.

Adequacy of existing information

As noted above, more information is needed on the short and long-term impacts of wind energy development on baleen whales and other Atlantic marine mammals that are not typically found in other developed wind energy areas that have been subject to environmental monitoring. 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 (i.e., baseline

[1] Copies of all Commission letters can be found at http://www.mmc.gov.
[2] Defined as coastal waters from Cape Hatteras, North Carolina, to West Palm Beach, Florida, see http://oceanexplorer.noaa.gov/explorations/islands01/background/bight/bight.html.

information) and throughout the duration of those activities. The collection of appropriate biological and environmental information should allow BOEM to identify 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) and facilitate development of more refined measures to prevent or mitigate such effects. Information should be collected at temporal and spatial scales that allow characterization of the inherent variability in the potentially affected ecosystems and provide the power to 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 (i.e., survival and recruitment). An ecosystem-based management approach requires additional information on habitat-use patterns and trophic relationships. As BOEM considers the development of large-scale wind farm development, an immediate and long-term commitment of effort and resources is required to acquire the knowledge needed to detect adverse impacts associated with energy development.

BOEM has made significant commitments to collecting abundance and distribution data for Atlantic marine mammals through Phases I and II of the Atlantic Marine Assessment Program for Protected Species and through a partnership with other federal agencies and private research institutions to establish a network of fixed acoustic arrays to monitor marine mammal vocalizations and ambient sound levels in high-use coastal areas of the U.S. mid-Atlantic. BOEM has also initiated the Real-time Opportunity for Development Environmental Observation (RODEO) study[3], a project designed to monitor the potential environmental impacts of wind energy development. One task associated with the RODEO study is to monitor the sound generated in air and in water during pile driving activities at the Block Island Wind Farm. This will provide information on the properties and propagation of sound generated during wind energy construction activities in Atlantic nearshore waters. This information can be used in combination with observational data on marine mammal movements to assess the impacts of specific wind energy development projects on marine mammals and to develop and refine site-specific measures to minimize the impacts of these activities. The Commission commends these efforts and recommends that BOEM continue both broad-scale and site-specific acoustic monitoring in the Atlantic to gather information on sound generated during site assessment, pile driving, and other wind energy development-related activities.

The Commission hopes these comments will be helpful to BOEM in meeting its responsibilities under the National Environmental Policy Act. Please let me know if you have any questions.

Sincerely,

Rebecca J. Lent

Rebecca J. Lent, Ph.D.
Executive Director

[3] http://www.boem.gov/Real-time-Opportunity-for-Development-Environmental-Observations/

cc: Jolie Harrison, NMFS Office of Protected Resources
David Bernhart, NMFS Southeast Regional Office
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