



July 31, 2006

Stephen Pritchard, Secretary
The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Massachusetts Environmental Policy Act Unit
100 Cambridge Street, Suite 900
Boston, MA 02114-2524
Attention: Aisling Eglinton, MEPA Analyst (EOEA #13812)

Re: **South Coast Offshore Wind Project; EOEA #13812**

Dear Secretary Pritchard:

Mass Audubon submits the following comments on the Environmental Notification Form (ENF) for the *South Coast Offshore Wind Project* (EOEA #13812.) The main focus of these comments is on the potential risks of the project to birds, particularly the roseate tern (*Sterna dougallii*), listed by both the federal and state governments as Endangered, and piping plover (*Charadrius melodus*), which is a federal and state-listed Threatened species.

Mass Audubon reviews the *South Coast Offshore Wind* project within the context our *Wind Energy Policy* (www.massaudubon.org/advocacy/wind). As responsible citizens, stewards, and advocates, we strongly support public policies and private projects that advance energy conservation and efficiency. We also support the development of wind farms as a renewable energy source to offset the effects of global climate change produced by the burning of fossil fuels. The challenge of this project is to demonstrate in the Draft Environmental Impact Report (DEIR) that the sites chosen are the most appropriate for wind farm facilities, and that the full range of alternatives to avoid, minimize, and mitigate impacts is adequately presented and considered. We have serious concerns about the siting of this particular wind energy development in Buzzards Bay, due to the sites' importance as a state Ocean Sanctuary and as a breeding ground for nearly half the North American population of federally-listed endangered roseate terns.

As you know, a mandatory Environmental Impact Report (EIR) is required by Massachusetts Executive Office of Environmental Affairs (EOEA)/Massachusetts Environmental Policy Act (MEPA) Unit regulations. We attended the July 12, 2006 MEPA Public Consultation and

Scoping Session, and will continue to review and comment on the project as it proceeds through MEPA review.

Mass Audubon urges that the Scope for the DEIR require that the concerns raised in this letter be addressed. We request that detailed information on existing conditions and habitat use is required to be presented, along with an evaluation of alternatives to avoid impacts and options for minimizing and mitigating impacts.

The Project

Patriot Renewables, LLC is proposing to construct and operate 90-120 wind turbine generators in the Buzzards Bay area. The project will produce up to 300 megawatts of renewable energy, which will be transmitted to the mainland electrical transmission system via a submarine cable interconnection to a location in the Town of Fairhaven at Egypt Lane. Project locations include three sites - off the coast of Fairhaven's Sconticut Island, Dartmouth's Barney's Joy; and off Naushon Island in the Elizabeth Islands' Town of Gosnold. The project is entirely within Commonwealth waters and tidelands at 2 to 3 miles from the Massachusetts coastline.

Mass Audubon Review & Comment

At his request, on May 24, 2006 Mass Audubon staff met with project proponent Jay Cashman and his development team to discuss components of the project as developed to that point. Thus far, this meeting has been the only consultation the project proponent has engaged in with Mass Audubon.

The project continues to appear to be conceptual as there are no definitive plans in the ENF upon which to comment in detail. The DEIR should provide more specificity on site locations, potential environmental impacts, and mitigation measures necessary to offset any potential adverse impacts.

The permitting process was initiated on May 30, 2006 when the applicant filed an ENF with your office. Applicable permits, which we and others may comment on during the permitting review processes, include a Chapter 91 License, and 401 Water Quality Certification from the Department of Environmental Protection, and a US Army Corps of Engineers 404 individual permit. The proposed project also requires Massachusetts Coastal Zone Management federal consistency review, and an Order of Conditions from the Fairhaven Conservation Commission. The project is also subject to *The Massachusetts Ocean Sanctuaries Act* as administered by the Department of Conservation and Recreation. The DEIR should demonstrate how the project would comply with these statutes.

Issues of Concern

Federal Designation

Buzzards Bay was designated an Estuary of National Significance by Congress in 1985. Although primarily a planning, policy and management program, Congress declared the importance of Buzzards Bay through this statutory designation. Through reauthorizations and implementation of *The US Clean Water Act*, Congress has since invested millions of dollars in research, restoration and collaborative planning focused on the Bay and surrounding communities. The DEIR should

demonstrate how this project is consistent with and meets the objectives of the *Buzzards Bay Comprehensive Conservation and Management Plan: 2006* prepared by your Coastal Zone Management Office.

State Designations

The Massachusetts Ocean Sanctuary Act (MGL Chapter 132A) was established by the Massachusetts legislature in 1970. Buzzards Bay was included in the Cape & Islands Sanctuary portion of the law. Section 15 of the Act prohibits “...*the building of any structure on the seabed floor or under the subsoil; the construction or operation of offshore or floating electric generating stations*”; Section 16 permits “*the generation, transmission, and distribution of electrical power...*” The DEIR should provide an interpretation and clarification of the statutory intent of this seemingly contradictory language. The DEIR should also provide an administrative history of enforcement of the provision and its regulations by your agencies.

Environmental Concerns

Endangered & Threatened Avian Species

The project proponent should include a detailed avian risk assessment in the DEIR paying particular attention to listed species. We also urge the U.S. Fish and Wildlife Service and your Division of Fisheries and Wildlife to undertake a careful and detailed review of the project’s potential risks to birds.

Roseate tern: This species is cited on the US and Commonwealth of Massachusetts Endangered Species lists as Endangered. Buzzards Bay is home to 99% of the state population and 45% of the North American population of this species. Approximately 90% of the North American population of roseate terns breeds on just four sites. Bird Island and Ram Island in Buzzards Bay (and occasionally Penikese Island) support approximately 45% of the North American breeding population of this species, while Great Gull Island and Falkner Island in Long Island Sound have historically supported another 45%. Eastern Egg Rock and a few other sites in the Gulf of Maine support additional and smaller populations. The restricted range, narrow habitat requirements, and concentration in so few sites make the Buzzards Bay Roseate tern population vitally important to the persistence of the species. On p. 4 of the ENF, the project proponent *...recognizes the fisheries and wildlife resources that exist within Buzzards Bay and is committed to incorporating mitigation measures into the project that will enhance those resources.* It will be difficult to mitigate negative impacts of development on roseate terns, as there are few to no other suitable nesting islands in Massachusetts. Even considering the rest of the northeastern U.S., there are few sites that would be likely to support and sustain even a portion of the Buzzards Bay breeding population of roseate terns. For example, Muskeget Island represents an apparently suitable breeding site (historically supporting a large population of roseate terns), yet several years of restoration efforts there have failed to restore breeding roseate terns to the island. Roseate (and common) terns require a very particular suite of conditions to colonize a site (e.g., few predators, limited human disturbance, no nesting gulls, access to suitable feeding areas, low vegetation, historical colonization and social attraction).

Much is known about habitat use and feeding ranges of roseate terns in Buzzards Bay. Roseate terns fly as much as 25-30 km to feed (Heinemann 1992, Gochfeld et al. 1998), and are known to travel throughout Buzzards Bay, both feeding and commuting from feeding sites. Regular surveys of foraging roseate terns in Buzzards Bay in 1990-91 confirmed that specific foraging areas might be used persistently by roseate terns (Heinemann 1992). Heinemann (1992) observed 11 and 16 km flight distances between the major roseate tern nesting colony at Bird Island, Massachusetts and its two primary feeding sites, one near Woods Hole / Falmouth and one near the entrance to the western end of the Cape Cod Canal.

Based on current knowledge, all of the proposed wind farm sites would likely be in areas that roseate (and common and least) terns pass through on the way to foraging sites. The proposed Study Area 1 (in proximity to West Island) situates turbines less than 4 km from Ram Island, and it is located on an important shallows feeding area for roseate terns (repeated observations of 10-75 foraging roseate terns off West Island were made by Heinemann (1992)). Study Area 2 also is in close proximity to a prime roseate tern foraging area located from Woods Hole to Naushon Island. Heinemann's two years of surveys of roseate tern foraging areas revealed the variable nature of tern feeding, and although there were consistently favored sites, weather, tide, and current conditions, changing coastal geology, and variable fish distribution all caused tern feeding behavior to change over time within and between seasons. Because of these findings we recommend three-years studies of habitat use by roseate terns that include migratory, breeding, and staging periods.

Piping plover: This species is cited on the U.S. and Massachusetts Endangered Species list as Threatened. Approximately 8-10% of the Massachusetts breeding population resides along the Buzzards Bay shoreline.

Common tern: This species is cited on the Massachusetts Endangered Species list as a species of Special Concern. At least 33% of the Massachusetts breeding population resides on three islands in Buzzards Bay. This species has been declining throughout the northeastern U.S. in recent years. Similar to roseate terns, common terns are known to forage and/or commute throughout Buzzards Bay.

Least tern: This species is cited on the U.S. and Massachusetts Endangered Species list as a species of Special Concern. Approximately 5% of the Massachusetts breeding population resides along the Buzzards Bay shoreline. This species has been declining throughout the northeastern U.S. in recent years. Least terns forage in sandy shoals in Buzzards Bay.

Tern and plover potential impacts: Research at two smaller-scale land-based coastal wind farms in Zeebrugge (East dam) and Brugge (Boudewijn canal), Belgium, indicates that gulls and terns can collide with the wind turbines (Everaert 2004, Everaert et al. 2002). It should be noted that these turbines were much smaller (< 60 – 85 m mast height) and fewer (5-23 turbines) than the array(s) proposed for Buzzards Bay. The majority of the common terns were breeding >100 m from the turbines. A total of 50 terns were found dead in one season. The estimated mean number of collision victims (including other species such as gulls) was 33 birds per turbine per year for the 14 turbines on the sea-directed dam. Based on these findings, the authors recommended no

new wind turbines should be constructed close to any important breeding colony of terns or gulls. For federally and state-listed endangered species, the loss of even one individual is a serious matter. Projects that result in “takings” of such species may be prohibited, requiring a showing of a net benefit to the population as a whole.

Nocturnally Migrating Passerines

Millions of songbirds are known to migrate along the eastern seaboard each fall and spring. Estimates of songbird migration should be made over multiple years. Songbirds do collide with wind turbines occasionally estimated at high frequency (e.g., GAO Report on Wind and Wildlife 2005). The Draft Environmental Impact Statement prepared for the proposed Cape Wind Energy Project on Horseshoe Shoal estimated that an average of 24% of migratory songbirds flew at a height containing the rotor swept zone. Attraction of migratory songbirds to lighted structures is well documented, particularly in inclement weather. Several controlled studies are underway examining the effects of different types of lighting on bird collisions with communications towers, and this work should be studied carefully to determine appropriate lighting for the proposed project.

Wintering Waterfowl

Numerous species of waterfowl are known to spend time staging, feeding, and wintering in Buzzards Bay. These include common and red-throated loons, mergansers, grebes, scoters, eiders, and other sea duck species. The common loon (*Gavia immer*) is a state-listed species of Special Concern.

Potential impacts due to collision, avoidance and loss of vital feeding, migratory, and staging habitat can be detrimental to bird populations, and should be addressed in the DEIR. There is a rapidly growing body of information from studies of European offshore and nearshore wind farms. These studies have demonstrated a significant disturbance and avoidance of turbines at 400 to over 600 meters for several waterfowl species. Regional assessments of habitat use should be performed in conjunction with the DEIR. Potential displacement of sea ducks from this feeding and wintering habitat must be considered, along with availability of suitable habitat in alternate sites.

Important Bird Areas

Several Important Bird Areas (IBAs) are located in or adjacent to Buzzards Bay including:

- Ram Island
- Bird Island
- Allens Pond and Westport River watershed

These sites have been designated as IBAs because they provide essential habitat for the bird populations of this region (see http://www.massaudubon.org/Birds_&_Beyond/IBAs/criteria.php). IBA designations were made with the cooperation of a technical committee including staff from Natural Heritage and Endangered Species Program, MassWildlife, Massachusetts Department of Conservation and Recreation, and Massachusetts Bays National Estuary Program. Other

participants include representatives from the US Forest Service, National Audubon Society, Manomet Center for Conservation Sciences, and individual ornithological experts.

The DEIR should show how the proposed project would not significantly harm these sites.

Further consideration of the Bird Island IBA

The Environmental Restoration Project for Bird Island in Marion, Massachusetts.

Mass Audubon recently wrote to the US Army Corp of Engineers in support of the Revetment and Nesting Habitat Restoration (Alternative C) as presented by the Corps' Public Notice of June 2, 2006. Bird Island is home to at least 22% of the northeastern US population of federally endangered roseate terns. This island is the only roseate tern colony in Massachusetts that persisted during the mid-20th century expansion of gull populations, and the Island has consistently provided important habitat for the roseate tern. Bird Island has one of the most thoroughly studied and well-understood populations of roseate terns anywhere in the world. This population has been maintained through extensive management since the 1960s, and ongoing management to ensure persistence of this population for the long-term is required.

The revetment and stabilization project is essential to maintaining the integrity of the Bird Island and its tern habitat. Alternative C provides for 2.2 acres of suitable nesting habitat, expanding the available area to both common and roseate terns. As the island's habitat has changed, roseate terns have decreased over the past several years from its peak of more than 2000 pairs in the year 2000. This project will allow maintenance and expansion of the population on this important nesting island, one of the few offshore sites in Massachusetts that is vital to endangered roseate terns. The effort and expense of the restoration project for Bird Island is indicative of the value of this habitat for an endangered species, and its proximity to the proposed wind farm sites must be considered in the DEIR.

Additional Concerns:

Bats

Three-years studies addressing bat use of the proposed sites in Buzzards Bay and potential collision risk analysis should be included in the scope of work and DEIR. There is growing evidence from numerous land-based wind farms that poorly sited wind turbines can cause thousands of bat deaths per year. Although little is known about bat collision risk in coastal and offshore environments, several species of bat are known to inhabit the area, and migrate along the coast. Previous studies have shown that migrating bats are more vulnerable to wind turbine collisions than are bats that are locally feeding (e.g., Kerns and Kerlinger 2004).

Sea Turtles

We recommend that the scope of work include surveys for sea turtles in Buzzards Bay. Before we completed our systematic aerial surveys in Nantucket Sound, there had been very few reports of sea turtles using the Sound. However, our surveys resulted in numerous turtle sightings. Mass Audubon's turtle stranding data indicate that sea turtles do use Buzzards Bay. The DEIR should

provide detailed information sea turtle presence and use of the Bay. Buzzards Bay may be an important area to juvenile sea turtles in particular.

The DEIR should also evaluate the impact of noise that will be generated in construction on sea turtles. We are also concerned that additional boat traffic will increase likelihood of collisions with sea turtles. Because sea turtles rely partially on magnetic fields for navigation, the DEIR should include an analysis of the risk to marine turtles due to the potential disorienting effects of magnetic fields produced by components such as underground cables (Irwin and Lohmann 2003).

Marine Mammals

The DEIR should address possible construction and post-construction impacts on marine mammals, particularly in regards to underwater noise impacts on cetaceans (whales, dolphins, and porpoises). It is well established that underwater noise may cause disorientation, disruption of social cohesion, displacement, alteration of travel routes, and/or stranding. Seals should be included in the risk analysis, as several species including harbor and grey seals are known to spend time in Buzzards Bay waters and coastal habitats.

Benthic Invertebrates, Shellfish and Fish

The risk of disruption of important benthic habitat for shellfish and other benthic invertebrates, larval and juvenile fish during and after construction should be addressed. Results of post-construction monitoring at European offshore wind energy installations should be examined to assess potential short- and longer-term effects of wind farm construction. Disturbance to the benthos of Buzzards Bay should be given particular attention because of the risk of construction stirring up residual oil from the 2003 Bouchard 120 barge spill, as well as other contaminants known to exist in high concentrations in parts of the Bay such as PCBs.

Safety Concerns

Of special concern to Mass Audubon is the presence in Buzzards Bay of major commercial and recreational ship traffic, some of which transits the Cape Cod Canal. This includes the annual transportation of 2 billion gallons of fuel oil by barge to the Mirant Power Station at the Canal in Sandwich.

The history of accidents and spills in this areas is significant and includes:

- 1969 189,000 gal. #2 fuel spilled off W. Falmouth
- 1990 *Bermuda Star* grounding off Cleveland Ledge
- 1990 *Bouchard Star* oil Barge #145 grounding
- 1992 *QE II* off Cuttyhunk
- 2003 98,000 gals. Bouchard Trans. Co. off Mass Audubon's Allens Pond Wildlife Sanctuary in Dartmouth.

Special caution should be taken in cooperation with the US Coast Guard and area harbormasters in siting wind energy turbines in the Bay. The DEIR should demonstrate how these safety measures would be achieved.

Oil and Lubricant Spills

Some additional issues that should be addressed in the DEIR include the documentation of amounts of oil and lubricants in each turbine and hub. The risks of lubricant and oil spills both in operation and in transit must be addressed, as well as plans for oil spill response and mitigation, particularly in terms of chronic or acute oiling risk to birds and other marine life.

Specific Issues to Be Addressed in the DEIR

At a minimum, the following should be addressed in the DEIR for adequate environmental impact assessment.

Project Details

It is difficult to anticipate the level of risk to avian and other species, without knowing specifics of the planned project. Specifics should include:

- Exact location(s) of turbines, including spacing between turbines
- Number of turbines
- Height of turbines
- Type of lighting
- Coloration of turbine blades
- Considerations of peak migration season and weather in turbine operation / shut-off
- Considerations of construction activity timing – duration and area of disturbance

Monitoring

Based on our experience conducting independent avian surveys in Nantucket Sound, our expertise in avian ecology, and reviews of other studies, we strongly recommend that at least three years of focused surveys covering different seasons of the year, using multiple methodologies be conducted to accurately assess avian habitat use, and collision risk and risk of displacement. Year to year variation in population movements and activity can vary widely, especially when considering populations of seabirds like terns and other fish-eating birds that track ephemeral resources. Surveys should use methods most appropriate for the questions asked (e.g., radar, infrared thermal detection, aerial and boat surveys) and should be consistent with established guidelines (e.g., National Wind Coordinating Committee 1999, Desholm et al. 2005, 2006).

Limitations of each survey method should be considered when interpreting results, and surveys using the latest available methodologies should be conducted:

- For at least three years
- At all seasons (for migrating passerines: across the full migratory periods of both fall and spring; for breeding and wintering birds: from arrival to departure)
- Where possible, in varied weather conditions
- At different times of day and night

Risk to each species group should be assessed separately and according to seasonal patterns because their habits and potential wind farm impacts may vary widely. As described earlier, the following groups are of particular concern:

- Roseate terns and piping plovers that breed, commute, and forage in Buzzards Bay
- Land birds that cross Buzzards Bay during spring and fall migration

- Wintering waterfowl that congregate in great numbers in Buzzards Bay
- Shorebirds that migrate through Buzzards Bay and feed along the coastline
- Pelagic and other seabirds that are surface or plunge divers and have been sighted in Buzzards Bay.

Remote sensing (thermal imagery and radar) should be conducted in conjunction with systematic field observations to confirm species identifications. Integration of environmental variables (tide, weather, lunar cycle, etc.) with survey results is important to understanding patterns of habitat use and collision risk.

We also recommend analysis of post-construction impacts of existing wind turbine facilities in Massachusetts including the turbines on the Mass Maritime Academy campus, and at Hull.

We further recommend the independent analysis of pre-construction survey data. The US Fish and Wildlife Service recommends that pre-construction evaluations should be conducted by a team of wildlife professionals with no vested interests (such as monetary or personal) in the sites selected including government employees, academic, nonprofit, and industry consultants.

If the project is permitted and constructed, post-construction monitoring should continue for at least three years following adaptive management plan developed by an independent panel of experts. Danish offshore wind farms provide an appropriate model for the design of post-construction monitoring.

Review of Literature

The DEIR should include a thorough review of current knowledge regarding risks to terns, plovers, and migrating songbirds, in addition to local documentation of bird activity, foraging and commuting heights. An assessment of current knowledge is necessary to appropriately design field surveys to fill knowledge gaps.

Methods of extrapolating collision risk from various survey techniques should be used carefully. The estimate of birds killed per year should include a range of values; it is impossible to predict the level of mortality precisely when there are so many unknowns. Level of certainty should be indicated for all estimates of mortality risk and other types of potential environmental impact.

In summary, we note that the project site contains significant and sensitive natural resources, particularly those of federally and state-listed rare bird species. The DEIR should document existing habitats and provide detailed evaluations of all aspects of project impacts. The DEIR should provide an alternatives analysis that explores all potential options to avoid, minimize, and mitigate impacts. The project proponent must demonstrate how the project will comply with requirements of federal and state endangered species laws, the Massachusetts Ocean Sanctuaries Act, and other applicable laws and regulations.

Thank you for your attention to these comments. We look forward to seeing them addressed in the DEIR.

Sincerely,

A handwritten signature in black ink, appearing to read "John J. Clarke". The signature is fluid and cursive, with the first name "John" being the most prominent.

John J. Clarke
Director
Public Policy & Government Relations

cc: Robert S. Cummings, Engr and Mgmt Services Inc.
NHESP
CZM
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