COMMONWEALTH OF MASSACHUSETTS

**EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS**

**DEPARTMENT OF ENVIRONMENTAL PROTECTION**

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**THE OFFICE OF APPEALS AND DISPUTE RESOLUTION**

November 21, 2014

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In the Matter of Docket Nos. WET-2012-027

File No. SE 43-2692

Richard Cook Jr.

Mashpee

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RECOMMENDED FINAL DECISION

This appeal was filed by a Ten Residents Group (the “Petitioners”) concerning a shellfish aquaculture project within Popponesset Bay in Mashpee proposed by Richard Cook, Jr. The Petitioners challenge a Superseding Order of Conditions (“SOC”) that the Massachusetts Department of Environmental Protection’s Southeast Regional Office issued to Mr. Cook approving the project under the Massachusetts Wetlands Protection Act and the Wetlands Regulations. M.G.L. c. 131, § 40; 310 CMR 10.00. The Mashpee Conservation Commission also approved the project. The parties filed a stipulation specifying the type and number of anchors to hold the aquaculture project in place, resolving the issue identified for adjudication of whether the SOC was sufficiently conditioned to prevent storm damage. The project site is within the habitat of three species of seabirds that are endangered or of special concern, the Roseate Tern, the Common Tern, and the Least Tern. The remaining issue for adjudication in this appeal addresses the effect of the project on the wetlands habitat of these Tern species. Rare species in Massachusetts are protected by the Natural Heritage and Endangered Species Program (“NHESP”) of the Division of Fisheries and Wildlife, Department of Fish and Game, under the Massachusetts Endangered Species Act. M.G.L. c. 131A, §§ 1-7. The habitat of rare wildlife species within wetlands resource areas is protected by the Department under the Wetlands Protection Act.

I conducted an evidentiary hearing on the question of whether the project would have an adverse effect on the habitat of the three Tern species in contravention of the Wetlands Regulations.[[1]](#footnote-1) Much of the Petitioners’ expert testimony was based on research that was not directly applicable to the proposed project and project site where the Terns forage for food, typically small fish. After consideration of all of the evidence, I conclude that the proposed aquaculture project will not have a short-term or long-term adverse effect on the habitat at the project site of the Roseate Tern, the Common Tern, or the Least Tern, either from the project’s installation or its operation. I recommend that the Department’s Commissioner issue a Final Decision that would sustain the SOC, with the addition of the conditions in the stipulation.

BACKGROUND

The project site is 1.99 acres in Popponesset Bay, approximately 600 feet northwest of Popponesset Spit, also called Mashpee Spit, which is a Barrier Beach separating Popponesset Bay from Nantucket Sound.[[2]](#footnote-2) Channels for the passage of boats are located to the north and east of the project site. The project site is located on a shallow, sandy shoal, called a flood tidal delta, located near the inlet to the Bay.[[3]](#footnote-3) Some portion of the flood tidal delta is exposed at low tide, but the project site is not exposed at low tide. Under the Wetlands Regulations, the site is the coastal resource area Land Under the Ocean, which is land extending seaward from mean low water. 310 CMR 10.25(2). The site is within mapped Estimated and Priority Habitat of State-Listed Rare Species. Massachusetts Natural Heritage Atlas (2008). The area is undisputedly actual habitat for the Roseate Tern, the Common Tern, and the Least Tern.Because the project site is always covered by water, the Land Under the Ocean provides foraging habitat, but does not provide nesting habitat because the Terns nest on land, directly on the ground. Popponesset Spit and some areas of the flood tidal delta beyond the project site that are exposed at low tide provide additional habitat functions for the Terns, including resting or loafing habitat.[[4]](#footnote-4) Popponesset Spit provides nesting habitat for the Least Tern and Piping Plover, another rare species.[[5]](#footnote-5)

Popponesset Bay, including the project site, currently is used extensively for recreation. Specific activities identified include swimming, wading, fishing, sailing, a youth sailing program, motor boating, kayaking, canoeing, paddle-boarding, and wind-surfing. Hearing Ex. 1, Correspondence from Brian Wall on behalf of Residents Group to Secretary Richard K. Sullivan re Proposed Shellfish Grant, Popponesset Bay (August 13, 2013). Areas of the flood tidal delta exposed at low tide are used for beaching small boats, swimming, walking, picnicking, kite flying, and fishing. Id. The watershed of Popponesset Bay is developed, and the shoreline has waterfront homes and numerous docks.

Terns, genus *Sterna*, are acrobatic and gregarious seabirds, generally with a black cap, gray and white undersides, and gray wings. See NHESP Fact Sheets for Roseate Tern, Common Tern, and Least Tern, <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/mesa-list/list-of-rare-species-in-massachusetts.html#MESAbird>.[[6]](#footnote-6) Roseate and Common Terns are about 12 to 14 inches in length, the Roseate with longer tail feathers, while Least Terns are about 9 inches long.[[7]](#footnote-7) They typically plunge-dive from flight to catch fish within the top six inches of the water surface. Burm PFDT, paras. 12, 15-16, 22; Perkins Hearing Testimony. Terns were hunted for their plumage for the decoration of hats in the 1800s, leading to precipitous declines in their populations prior to their legal protection. NHESP Fact Sheets. More recently, Terns have been displaced from nesting sites by herring gulls and their populations have fluctuated.[[8]](#footnote-8) Id. The largest populations of Terns in Massachusetts are found in Buzzards Bay and on Cape Cod. With some variation between species, the Terns arrive in late April or the beginning of May from South America and after courtship, they nest in colonies and raise chicks. Id. Typically, they fly from their nesting colony to a good foraging site and return with a single fish for their brood. Terns leave their nesting colonies after the chicks have fledged and gather on staging areas prior to their southerly migration in late August or early September. Id. The lifespan of Terns may exceed 20 years. Id.

The Roseate Tern, *Sterna dougalli*, is a federally and state-listed endangered species which nests in several sites in coastal New England, including Massachusetts, and migrates to South America. [[9]](#footnote-9) The Roseate Tern feeds primarily by plunge-diving for American Sand Lance, a small fish that comprises about 70% of its diet. NHESP Fact Sheet.[[10]](#footnote-10) It will also feed by surface dipping or contact dipping for other small fish. Roseate Terns prefer shallow sandbars, shoals, or similar areas for foraging that are likely to attract Sand Lance, within 32 km or about 20 miles of their nesting sites. Burm PFDT, para. 25, citing U.S. Fish and Wildlife Service, *Caribbean Roseate Tern and North Atlantic Roseate Tern (Sterna dougallii dougallii), 5 year Review Summary and Evaluation* (2010). Roseate Terns in Massachusetts nest in colonies with Common Terns. The vast majority of Roseate Terns in Massachusetts nest on two islands in Buzzards Bay, Bird Island in Marion and Ram Island in Mattapoissett, as well as Monomoy Island in Chatham. Popponesset Bay foraging habitat is 24 to 39 km, or about 15 to 24 miles, from the nesting habitat. Burm PFDT, para. 25.

The Common Tern, *Sterna hirundo,* isa Species of Special Concern that also feeds primarily by plunge-diving, surface dipping, or contact dipping but is more of a food generalist than the Roseate Tern. NHESP Fact Sheet. Common Terns will forage for small fish, including Sand Lance, and may also eat crustaceans and insects. Id. Common Terns often share nesting areas with Roseate Terns, but Common Terns will defend the nests against intrusions including pecking human intruders and thereby also protect Roseate Tern nests. Id. Common Terns nest at Bird and Ram Islands and also at Penikese Island in Buzzards Bay.

The Least Tern, *Sternula antillarum,* is a Species of Special Concern that also feeds by plunge-diving, surface dipping, or contact dipping for small fish and may also eat crustaceans and insects. Least Terns forage in shallow water, bays and lagoons. Popponesset Bay is also habitat for the Piping Plover, *Charadrius melodus*, a federal and State Threatened Species, but these small shorebirds forage for food along the wrack line on beaches or on flats at low tide rather than in the open water such as the project site. Least Terns typically nest with Piping Plovers and both species nest on Popponesset Spit.

Sand Lance has been identified as a primary food source for Terns in Popponesset Bay. American Sand Lance, *Ammodytes americanus*, is a small, slender fish, eel-like in appearance. They vary in length from about three to nine inches. While Sand Lance swim in large schools, they also have the distinctive behavior of burrowing into a sandy substrate for rest or protection from predators. Burm PFDT, para. 24. Schools range from hundreds to many thousands of individual fish. Their major prey is copepods, a very small crustacean. See Meyer, Thomas L., Richard A Cooper, and Richard W. Langton, *Relative Abundance, Behavior, and Food Habits of the American Sand Lance, Ammodytes Americanus, from the Gulf of Maine*, Fishery Bulletin: Vol. 77, No. 1 (1979) , p. 248-249, cited in Nelson, G., and M. Ross, *Biology and Population Changes of Northern Sand Lance (Ammodytes dubius) from the Gulf of Maine to the Middle Atlantic Bight*, J. Northw. Atl. Fish. Sci. Vol. 11:11-27 (1991), p. 24. Another species of Sand Lance, *Ammodytes dubius*, is similar but typically found further from the shoreline. Nelson, G., and M. Ross, *Biology and Population Changes of Northern Sand Lance (Ammodytes dubius) from the Gulf of Maine to the Middle Atlantic Bight*, J. Northw. Atl. Fish. Sci. Vol. 11:11-27 (1991).[[11]](#footnote-11) Sand Lances are important to the marine food chain because they are consumed by a wide variety of commercially important fish as well as seabirds and whales. Id.

Mr. Cook’s project is designed to grow oysters for market. Commercial shellfishing in Massachusetts includes both oysters and clams, with about 1,300 acres in production as of 2011, with more than half on Cape Cod. See <http://extension.umass.edu/aquaculture>. In addition to their value as food, cultured oysters have garnered interest recently for their potential to improve water quality. Notice of Intent, 2/28/2012, Attachment VI.[[12]](#footnote-12) Oysters are filter-feeding organisms, removing from the water column algae, plankton, and suspended solids which contain nitrogen. Id. An adult oyster can filter 50 gallons of water a day. Id. Thus, oysters can help improve water quality by reducing nitrogen from human sources that has entered the marine ecosystem. Id.; see MEPA Certificate for Proposed Shellfish Grant (August 23, 2013)(Cape Cod Commission determined project consistent with goal of maintaining and restoring ecological integrity of marine water through demonstrated nutrient uptake through shellfish aquaculture). Oysters themselves serve as habitat for small marine organisms which in turn serve as food for small fish which attract larger fish. Notice of Intent, 2/28/2012, Attachment VI. Thus, oyster beds are considered to have important ecological benefits. Id.

The proposed aquaculture project includes the placement of not more than 4,500 flexible polyethylene mesh grow-out bags (“bags”) on 1.99 acres on the flood tidal delta in Popponesset Bay.[[13]](#footnote-13) The project area is 345 feet by 250 feet, but with setbacks the bags will occupy an area of no more than 335 feet by 240 feet. Cook PFDT, para. 8. Each bag would be 36 inches long, 18 inches wide, and 3 to 4 inches deep. Cook PFDT and Oral Testimony. The bags would not rest on the ocean floor, but instead would be suspended over the sandy substrate by the lines.[[14]](#footnote-14) The bags are attached to lines, and there will be up to forty lines, six feet apart, with each line holding up to 114 bags with half on each side of each line. Cook PFDT and Oral Testimony. There would be about three feet between the bags and 3 feet between adjacent lines. Id. The Department in its SOC calculated the maximum area of Land Under the Ocean altered by the project as 20,250 square feet.[[15]](#footnote-15) SOC, p. 4. The lines are held in place by special anchors that can be placed by hand without mechanical equipment.[[16]](#footnote-16) Id. Bags will be added gradually, as Mr. Cook purchases seed at the hatchery and may transfer shellfish from his Ockway Bay aquaculture site.[[17]](#footnote-17) Cook PFDT, para. 9 and Cross. The oysters may be harvested only after they reach the legal size of three inches, which occurs in about 18 months to three years. Cook PFDT, para. 9. The oysters are moved to deeper water in winter. Id.

Mr. Cook expects to have one or two workers accessing the site in a 21-foot skiff and working for four but no more than six hours during the low tide cycle. Cook Oral Testimony. Because low tides occur regularly but vary as to time of day, the workers will be at the site at predictable but varying times to take advantage of the low water. Walking in the aisles between the lines in the shallow water at low tide, the workers will move the bags by hand to loosen and remove marine growth on the bags as well as to rearrange the oysters to promote their growth. Id. Approximately four times during their growth, the oysters will be transferred between bags and sorted, a process that may involve use of an electrical sorter. Id. The sorter itself is quiet, but the oysters make some noise as they knock against each other or against the bottom of the skiff during the sorting process. Id.

Because shellfish licenses are issued by coastal municipalities in Massachusetts, Mr. Cook applied for and obtained an aquaculture license from the Town of Mashpee in December 2011 to conduct the project. M.G.L. c. 130, § 57. The Town’s findings state that the grant, the term used to describe the area that may be shellfished, is located at least 1,150 from the developed shoreline. Mashpee Board of Selectmen Decision on Application for Aquaculture License, attached to NOI, Findings 2 and 4. The Mashpee Wampanoag Tribe has a grant between the shoreline and Mr. Cook’s grant. Id. The Town found that the only noise generated by the operation of the grant would be an electric motor used periodically to sort the shellfish, and Mr. Cook had represented that between Memorial Day and Labor Day he would use the motor only on weekdays after 8:00 am. Id. at Findings 13 and 14.[[18]](#footnote-18) The Town found that the shellfish cultivation has a positive effect on Popponesset Bay. Id. at Finding 16. The only visible markers of Mr. Cook’s project are eight buoys delineating the four corners and four sides of the grant. Id. at Finding 16. The Town found that the project would not impair navigable waters or the private rights of any person. Id. at Findings 21 and 22. In January 2012, the Massachusetts Division of Marine Fisheries (“DMF”) conducted a survey of the site and concluded that the project would not have an adverse impact on shellfish or other natural resources of Popponesset Bay. DMF Letter to Town of Mashpee, January 20, 2012; See M.G.L. c. 130, § 57, 322 CMR 15.00.

Mr. Cook filed a Notice of Intent with the Mashpee Conservation Commission pursuant to the Wetlands Regulations to use no more than 5,000 bags during the first year and no more than 15,000 thereafter. Mr. Cook subsequently amended the proposed project to reduce the number of bags to 2,000 the first year and no more than 5,000 thereafter. The Division of Fisheries and Wildlife notified Mr. Cook and the Mashpee Conservation Commission of NHESP’s determination that the project would not adversely affect the actual habitat of state-protected rare species for purposes of the Wetlands Protection Act and would not result in a prohibited “take” of state-listed species pursuant to the Massachusetts Endangered Species Act. Gilmore PFDT, Ex. 2, Correspondence from Thomas French dated March 22, 2012. The Commission approved the project in July 2012. The Petitioners requested review by the Department, which issued an SOC in November 2012 after the project had been further reduced to a maximum of 4,500 bags on the 1.99 acre site. In addition to the DMF approval, the Department specifically noted the opinion of NHESP issued March 22, 2012 that the project will not have an adverse effect on the actual habitat of state-protected rare wildlife species. Id.

The Petitioners filed this appeal of the Department’s SOC. A Pre-Hearing Conference was held in December 2012 with Mr. Cook, representatives of the Petitioners, the Department and the Mashpee Conservation Commission. The appeal was stayed while Mr. Cook filed an Environmental Notification Form to comply with the Massachusetts Environmental Policy Act (“MEPA”), M.G.L. c. 30, §§ 61-62H. In August 2013, Mr. Cook received a MEPA Certificate determining that the project did not require preparation of an Environmental Impact Report. The appeal was further stayed while the parties discussed settlement. After settlement efforts failed, the parties agreed to a schedule for litigation and two issues for adjudication. Prior to the hearing, the parties filed a stipulation which resolved the issue of whether the SOC for work on Land Under the Ocean is sufficiently conditioned to contribute to the prevention of storm damage, including from storm–borne debris. I recommend that the conditions identified in the stipulation be incorporated into the Final Order of Conditions for this project.

**ISSUE FOR ADJUDICATION**

With the stipulation related to storm damage prevention, the sole issue remaining for adjudication in this appeal is whether the project meets the performance standard for Land Under the Ocean related to the protection of rare species at 310 CMR 10.25(7) and 310 CMR 10.37.

Under the wetlands regulations, the burden of going forward and the burden of proof are placed upon the party contesting the Department’s position in an appeal. 310 CMR 10.03(2); 310 CMR 10.05(7)(j)3.b. The weight to be attached to any evidence in the record rests with the sound discretion of the Presiding Officer. 310 CMR 1.01(13)(h)1.

**REGULATORY FRAMEWORK**

Rare species are protected under two statutes and their respective regulations, the Wetlands Protection Act and the Massachusetts Endangered Species Act, in addition to any protection afforded by the federal Endangered Species Act. See 16 U.S.C. §§ 1531-1544. The Wetlands Protection Act, administered by the Department, was amended in 1986 to add wildlife habitat within wetland resource areas as a protected interest. St. 1986, c. 262. The Act defines “wildlife habitat” as areas “which, due to their plant community composition and structure, hydrologic regime or other characteristics, provide important food, shelter, migratory or overwintering areas, or breeding areas for wildlife.” M.G.L. c. 131, § 40. The Department’s Wetlands Regulations contain provisions related to wildlife habitat within the context of its jurisdiction over alteration of various wetland resource areas. The habitat of rare wildlife species within wetland resource areas is protected by a stringent standard and specific procedures related to estimated habitat maps and opinions of the NHESP as to the effects of a project. 310 CMR 10.37 and 10.59. In 1990, the legislature enacted the Massachusetts Endangered Species Act (“MESA”) to provide protection to the species themselves from harm, as well as their wetland or upland habitats from human encroachment. M.G.L. c. 131A, §§ 1-7; See Pepin v. Div. Fisheries & Wildlife, 467 Mass. 210 (2014). The Massachusetts Endangered Species Act program is administered by NHESP independently from the Department’s authority to regulate activities in resource areas that serve as habitat of a rare species. The resolution of this appeal reflects the jurisdiction, procedures, and standards of the Wetlands Protection Act governing wetlands habitat of rare species.

The wetlands resource area where the project is proposed, Land Under the Ocean, is vast, including all land extending seaward from the low water line to the extent of municipal boundaries. 310 CMR 10.25(2). Land Under the Ocean provides feeding, spawning, nursery and shelter areas for marine organisms related to marine fisheries. 310 CMR 10.25(1). Nearshore areas, a subset of Land Under the Ocean, are presumed significant to wildlife habitat in addition to the interests of storm damage prevention, flood control, and the protection of marine fisheries. Id. The preamble of the Wetlands Regulations for Land Under the Ocean identifies factors that are critical to the protection of marine fisheries and wildlife: water circulation, distribution of sediment grain size, water quality, finfish habitat, and important food for wildlife. 310 CMR 10.25(1). The preamble specifically states, “Nearshore areas of land under the ocean also provide important food for birds.” Id. Thus, while the resource area does not include the air where the Terns are foraging for food in flight, it is clear that Land Under the Ocean serves as wildlife habitat for the Terns by supporting the small fish the Terns require for food.[[19]](#footnote-19)

The Wetlands Regulations define rare species to include animal species officially listed as endangered, threatened, or of special concern by NHESP under 321 CMR 10.60; for that reason, each of the three Tern species is considered a rare species for purposes of protection. 310 CMR 10.04 (Rare Species). The performance standard for proposed alteration of Land Under the Ocean within rare species habitat is that “no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.37.” 310 CMR 10.25(7). The procedures for the review of projects in rare species habitat include an opinion by NHESP as to whether the performance standard is met, described as follows:

Notwithstanding 310 CMR 10.24(7) and 10.25 and 310 CMR 10.27 through 10.35, if a proposed project is found by the issuing authority to alter a resource area which is part of the habitat of a state-listed species, such project shall not be permitted to have any short or long term adverse effects on the habitat of the local population of that species. A determination of whether or not a proposed project will have such an adverse effect shall be made by the issuing authority. However, a written opinion of the [NHESP] Program on whether or not a proposed project will have such an adverse effect shall be presumed by the issuing authority to be correct. This presumption is rebuttable and may be overcome upon a clear showing to the contrary.

310 CMR 10.37. “Adverse effect” is a defined term in the Coastal Wetlands Regulations, as follows:

Adverse effect means a greater than negligible change in the resource area or one of its characteristics or factors that diminishes the value of the resource area to one or more of the specific interests of M.G.L. c. 131, § 40, as determined by the issuing authority. "Negligible" means small enough to be disregarded.

310 CMR 10.23(Adverse effect). Thus, the resolution of the appeal turns on the question of whether the proposed project will have a short or long term adverse effect on the habitat provided by the Land Under the Ocean of the local population of the Roseate Tern, Common Tern, or Least Tern.

**TESTIMONY OF WITNESSES**

The Petitioners offered the testimony of Jeffrey Burm, a consultant with an extensive background in avian biology. Burm, PFDT, para. 4-5. From 2002 to 2007, he served as the lead avian specialist for field research on the potential impacts to bird species, including rare species, for the Cape Wind Offshore Wind Farm. He noted his familiarity with numerous studies on rare bird species habitat in Massachusetts. Burm PFDT, para. 5. Mr. Burm is qualified as an expert witness. Mr. Burm visited the project site for 1.5 hours on June 25, 2013 and observed a flock of three Roseate Terns and several flocks of Common Terns foraging above the project site and resting on exposed tidal flats. Burm PFDT, para. 20. He described the feeding, nesting, and staging behavior of the three Tern species, as well as the Piping Plover. Burn PFDT, paras. 9 to 26. He testified that the proposed project would adversely affect aspects of the habitat of the three Tern species. He asserted that the initial construction, the disturbance from the operation of the grant, and the alteration of the sand shoal would each affect the Terns’ foraging habitat. Burm PFDT, para. 27. He cited to research to support his testimony.

Specifically, Mr. Burm testified that the transport and installation of the equipment, including drilling for the anchors, would create noise and disturbance at the site for a week or more. Burm PFDT, para. 28. He identified further disturbance from the operation of the project from planting, harvesting, rotating the bags, and similar activities by workers for five hours a day moving through the water and using motorboats and electrical sorting equipment. Id. He testified that research showed that pedestrians, beach vehicles, boats or dogs, which he characterized as “similar types of human-related disturbance” to the activities associated with the aquaculture project, caused flocks of waterbirds to flush during resting and feeding, defining “flush” as “startle or disperse by flying away.” Burm PFDT, para. 29, citing Trull, P., S. Hecker, M.J. Watson, and I.C.T. Nisbet, *Staging of Roseate Terns Sterna Dougallii in the Post-Breeding Period Around Cape Cod, Massachusetts, United States,* Atlantic Seabirds1:145-158 (1999). He cited another experimental study which found that disturbance of European oystercatchers feeding in mud flats would reduce feeding habitat use and the amount of food provided to chicks. Burm PFDT, para. 29, citing Verhulst, S., K. Oosterbeek and B.J. Ens., *Experimental Evidence for Effects of Human Disturbance on Foraging and Parental Care in Oystercatchers*, Biological Conservation 101, 375-380 (2001). Finally, he referenced another study where human disturbance involving watercraft provoked a flushing response; the researchers recommended an average buffer zone of 140 meters for mixed flocks and 83 to 137 meters, or 272 to 450 feet, for Terns. Burm PFDT, para. 29, citing Rogers, J.A., Jr. and S.T. Schwikert, *Buffer Zone Distances to Protect Foraging and Loafing Waterbirds from Disturbance by Personal Watercraft and Outboard-Powered Boats*, Conservation Biology 16:216-224 (2002).

Mr. Burm testified that in his opinion the proposed project would “adversely impact the Tern species’ foraging activity across a significant portion of the sand shoal habitat for a majority of the daylight hours when the habitat is currently used by terns for foraging.” Burm PFDT, para. 30. He stated that Terns may travel across the site many times a day for food for themselves and their young, at any time during daylight hours when the aquaculture operation will be underway. Id. Citing to the studies, he testified that the human activities at the site are likely to cause flushing that disrupts or deters feeding within 250 to 400 feet, adversely affecting foraging within the project site and across most of the flood tidal delta. Burm PFDT, para. 30, citing Rogers, J.A., Jr. and S.T. Schwikert, *Buffer Zone Distances to Protect Foraging and Loafing Waterbirds from Disturbance by Personal Watercraft and Outboard-Powered Boats*, Conservation Biology 16:216-224 (2002). Mr. Burm testified that repeated or frequent flushing, even if the Terns returned to the foraging grounds, would increase stress and energy expenditure, decrease feeding rates, decrease reproductive success, and lead to avoidance of the foraging site. Burm PFDT, para. 31. In his opinion, limitations on the productivity of foraging would impair the ability of adults and fledglings to prepare for their migration to South America. Burm PFDT, para. 32.

Mr. Burm testified that the aquaculture equipment and movement of workers along the aisles would disrupt the sandy habitat of the Sand Lance, causing a reduction in this critical food source. Burm PFDT, para. 33. He testified that the placement of the bags on the ocean bottom would preclude the burrowing of Sand Lance, and the bags would also cause erosion and accretion of the substrate. Id. He stated that the passage of workers along the aisles would further disturb the substrate and cause the Sand Lance to disperse. Mr. Burm stated that the alteration and disturbance “would generally reduce the supply of this key prey fish at, or even cause the prey to avoid, the Popponesset Bay sand shoal.” Id. Citing studies on the positive correlation between availability of prey and increased breeding success and chick survival, Mr. Burm asserted that a reduction in Sand Lance would adversely affect the Tern species and compromise the utility of the site as prime foraging habitat for Roseate Tern and available foraging habitat for Common and Least Terns. Burm PFDT, para. 34. He stated that the SOC contained no conditions to prevent or minimize adverse impacts, and that the habitat of Popponesset Bay was so critical that the project would negatively impact the productivity and survival of the Roseate Tern. Burm PFDT, paras. 35-36.

Stanley Humphries offered testimony for the Petitioners on the alteration of Land Under the Ocean by the project.[[20]](#footnote-20) He is a coastal geologist with extensive experience and is qualified as an expert witness. Humphries PFDT, paras. 1-6. He testified that the bags containing shellfish will rest very close to the ocean floor, thereby obstructing the normal flow of current and sediments. In Mr. Humphries’ opinion, the bags would cause scour, erosion, deposition, and accretion, altering the ocean substrate. Humphries PFDT, para. 13. He further testified that workers walking along the aisles would disturb the substrate and cause turbidity as finer sediments were dispersed in the water column. Humphries PFDT, para. 16. On a larger scale, he testified that the bags would disrupt existing sediment transport conditions by obstructing the flow from the inlet to the southwest side of the flood tidal delta. Humphries PFDT, para. 16. Mr. Humphries acknowledged that various recreational activities currently conducted at the site could contribute to some erosion, but did not believe it would be substantial. Humphries Oral Testimony. He stated that he had not evaluated the effect of motorized boats in the channels on the northeast and southeast sides of the project site or the net impact of loss of sediment and trapping of sediment that he described. Humphries Oral Testimony. He stated that his opinion was based on his knowledge of tidal cycles at and characteristics of the site, rather than research or any quantitative analysis. Humphries Oral Testimony. He did not offer an opinion as to whether the changes in sediment would affect fish at the site or any testimony related to fish.

Richard J. Cook, Jr., testified in support of his project as the applicant. In addition to managing an electrical contracting business, he has been a commercial fisherman and waterman for 34 years. Cook PFDT, para. 2. He is qualified as an expert witness as to his own project and as to oyster aquaculture. Since he received authorization in 1983 from Mashpee to operate a 3.3 acre shellfish grant in Ockway Bay, a section of Popponesset Bay, he has gained experience with methods of growing oysters. Cook PFDT, para. 3. Mr. Cook reported that neighbors of the Ockway Bay facility have been supportive of that project. He stated that he sought another location with better conditions for growing oysters. Cook PFDT, paras. 3 and 5. He provided a detailed description of the proposed project. His testimony reflected some modifications to the scope of the project since he filed the Notice of Intent and the Department issued its SOC. He testified that he expected that at full operation of the grant he would have about 3,000 bags rather than the approved maximum of 4,500 bags. Cook Oral Testimony.

Although Mr. Cook declined to state that there would never be more than two workers at the project site, he stated that the project would likely involve one or two workers over a four hour period, for two hours on either side of low tide. Cook Oral Testimony. He testified that the installation of the anchors could be accomplished by one person in minutes with no noise. Cook Oral Testimony. He testified that “flipping” the bags, the term for jostling each bag to redistribute the oysters within, involved a jerky motion but no noise if underwater and some noise, but not like a bag of rocks, if on the boat. Id. He stated that the sorter on the boat involved some noise from the fall of the oysters into bins. Id. Mr. Cook stated that the sound was audible but not like rocks knocking together. Id. He testified that use of the sorter had not been a problem at the Ockway Bay grant, and he had not personally observed any disruption to coastal birds from the sorter. On the contrary, he stated that coastal birds were attracted by marine organisms that might be on the outside of the oyster shells. Cook Oral Testimony.

Simon Perkins also testified on behalf of Mr. Cook in support of the project. Mr. Perkins is the owner of an ecological consulting firm and formerly the Senior Field Ornithologist for the Massachusetts Audubon Society. Perkins PFDT, paras. 1-3. He has served as an avian consultant to the NHESP on projects, including the restoration of Tern nesting habitat in Buzzards Bay and habitat mapping for Roseate Terns. Perkins PFDT, para. 5. He stated that through his extensive experience as a birder he had an intimate understanding of bird behavior, including “first-hand knowledge of the degree to which terns interact with humans, how they respond to difference types of human activities, and their tolerance thresholds.” Perkins PFDT. para. 6. He is qualified as an expert witness. He testified that he visited the site about five years ago. Although his visit was not as recent as Mr. Burm’s, there was no testimony that the site had materially changed in the interim. He agreed with the descriptive testimony of Mr. Burm about the Tern species, their characteristics, and their presence at the site. Burm PFDT, paras. 8 and 9. He disagreed, however, with Mr. Burm’s conclusions about the impact of the proposed project on the ability of the flood tidal delta at the site to provide foraging habitat for Roseate, Common, and Least Terns. Perkins PFDT, para. 10.

Mr. Perkins testified that access by boats, using the sorting equipment, and walking along the aisles are the types of activities that the Tern species “encounter routinely” and the activities will not disrupt foraging to any significant extent. Perkins PFDT, para. 10. He stated that all three Tern species will approach slow-moving or anchored boats to feed on bait fish. Id. Mr. Perkins testified that the proposed aquaculture activities are analogous to clamming, which the Tern species tolerate to the extent that a flock may loaf nearby.[[21]](#footnote-21) Id. In contrast, a flock of Terns will flush in response to a sudden movement, such as a fast-approaching boat or beach vehicle, which does not occur in clamming or aquacultural activities. Id. He stated that Mr. Cook had indicated that he would forgo use of the sorter between July 1 and September 15, so that there would be no use of motorized equipment during the season of Tern foraging. Id. He testified, however, that the electric sorter would not cause terns to flush or otherwise adversely affect them. Perkins Oral Testimony.

Mr. Perkins disagreed with the applicability of Mr. Burm’s reference to a study indicating that provocative approaches could cause flushing because in his opinion the Terns could habituate to human activity and the activity itself would not disrupt their feeding activities. Id. See Burm PFDT, para. 30, citing Rogers, J.A., Jr. and S.T. Schwikert, *Buffer Zone Distances to Protect Foraging and Loafing Waterbirds from Disturbance by Personal Watercraft and Outboard-Powered Boats*, Conservation Biology 16:216-224 (2002). Mr. Perkins testified that the Terns would plunge-dive in close proximity to people standing in shallow water and not be deterred from using any portion of the project site. Perkins PFDT, para. 10. He testified that the study cited by Mr. Burm that Terns suffer from stress as a result of limited foraging and resting opportunities during the post-breeding season do not support a conclusion that these impacts will occur from the presence and activities of aquaculture workers for a few hours a day at the project site. Id., referring to Trull, P., S. Hecker, M.J. Watson, and I.C.T. Nisbet, *Staging of Roseate Terns Sterna Dougallii in the Post-Breeding Period Around Cape Cod, Massachusetts, United States,* Atlantic Seabirds1:145-158 (1999). He concurred that decreased prey could reduce Tern breeding success, as described in research, but did not believe that the aquaculture project would reduce the availability of Sand Lance at the site. Id., referring to Safina, C., J. Burger, M. Gochfeld, and R. Wagner, *Evidence for Food Limitation of Common and Roseate Tern Reproduction,* Condor 90:852-859 (1988). Generally, he did not believe the proposed project would adversely affect the habitat at the project site or the ability of the terns to forage there in any significant way. Perkins PFDT. paras. 11 and 12.

Daniel F. Gilmore, a member of the Department’s wetlands staff for 25 years, testified on behalf of the Department in support of the SOC. In addition to his routine duties with the wetlands program, Mr. Gilmore has worked with the Division of Fisheries and Wildlife on evaluating project impacts within rare species habitat, including Piping Plover and Terns, for over 20 years and regularly attends its Annual Coastal Waterbird Meeting. Gilmore PFDT, paras. 1-3. He is qualified as an expert witness. He referred to the letter from NHESP for the opinion that the project was in actual habitat of the rare Tern species but would have no adverse effect on their habitat. Gilmore PFDT, para. 7 and Ex. 2. He stated that, as provided by the Wetlands Regulations, this determination is presumed to be correct and he relied on the NHESP opinion. Id.

Mr. Gilmore also consulted with the NHESP prior to drafting the SOC. He attached an email from Carolyn Mostello, a staff member of the Division of Fisheries and Wildlife, who confirmed its view that it “did not anticipate this project will have any adverse impacts on resource area habitat.”[[22]](#footnote-22) Id. and Ex. 3. Mr. Gilmore testified that he understood the NHESP opinion to be that the project is located 1) near the breeding grounds of Piping Plover and Least Tern; 2) near staging and loafing grounds of Roseate, Common, and Least Terns; and 3) within the foraging grounds of the three Tern species. Id. Ms. Mostello further indicated that subtidal cages are unlikely to inhibit foraging of Terns or loafing habitat of Piping Plovers and Terns, and added that Terns could not loaf in the area to the extent it is underwater. She also stated in her email that the project could enhance Tern foraging habitat by attracting small fish but could not draw a firm conclusion due to lack of sufficient information. Id.

Mr. Gilmore testified that Mr. Humphries had not recognized that the bags will be placed on a transient rather than permanent basis, will be repositioned regularly, and will be moved seasonally, so that any potential impacts would be temporary. Gilmore Reb., para. 10. He stated that Mr. Humphries had not shown that the alteration of Land Under the Ocean would result in an adverse effect on the Tern habitat. Id.

In response to Mr. Burm’s testimony, Mr. Gilmore distinguished between the foraging of a wading bird, as described in the study of the Eurpean Oystercatcher, and Terns which forage in flight and plunge-dive to catch fish. Gilmore Rebuttal Testimony, para. 12, referring to Verhulst, S., K. Oosterbeek and B.J. Ens., *Experimental Evidence for Effects of Human Disturbance on Foraging and Parental Care in Oystercatchers*, Biological Conservation 101, 375-380 (2001). Although wading birds like the Oystercatcher may be flushed by human activity, he stated that Terns would not be flushed while foraging. Id. He further stated that “Terns are regularly observed flying and diving in areas where people are boating, fishing and shellfishing, swimming and sunbathing.” Id. Mr. Gilmore noted that Mr. Burm had cited no studies or instances of an aquaculture project causing adverse impacts to rare avian habitat. Id. Mr. Gilmore testified that, in his professional opinion, based on his own expertise as well as the NHESP opinion, that the actual habitat of state-listed rare Tern species would not be adversely impacted by the project and that the project therefore meets the performance standard of 310 CMR 10.25(7). Gilmore PFDT, para. 7.

**FINDINGS AND CONCLUSIONS**

Based on the testimony and the record, I conclude that the Petitioners have not clearly shown that NHESP’s opinion is incorrect, and further that that they have not shown that the project will have an adverse effect on the habitat of rare species. Under the Wetlands Regulations, the issuing authority must determine whether a project will have an adverse effect on rare species habitat. The written opinion of the NHESP as to whether or not the project will have an adverse effect is presumed to be correct, absent rebuttal by a clear showing to the contrary. 310 CMR 10.37. NHESP provided an opinion that the project would not have adverse effects on resource area habitat and that the substidal placement of the cages would not inhibit Tern foraging activities or reduce their loafing habitat. Gilmore PFDT, Ex. 2. The NHESP review was not cursory; additional support was provided by Carolyn Mostello in response to an inquiry from Mr. Gilmore which demonstrated an understanding of the project site and the effect of the project on Terns. The Department properly relied on this opinion in issuing the SOC.

To rebut the presumption, the Petitioners must clearly show that the project will result in adverse effects to the Tern’s habitat. The Petitioners’ testimony was insufficient to support their position. Even without relying on the presumption, however, I reach the same conclusion that the Petitioners have not shown by a preponderance of the evidence that the project will have an adverse impact on the Tern habitat.[[23]](#footnote-23) My conclusion is based on factual findings, primarily that because the site is foraging habitat where the Terns are in flight above the resource area, project activities will not disturb them. Further, the alteration of the resource area related to the project will not affect the availability of small prey fish, including the Sand Lance, on which the terns depend for food. Thus, I recommend that the Commissioner, as the issuing authority after a hearing, sustain the SOC based upon a determination that the project will not have an adverse effect on rare species habitat.

**Resource Area, its Characteristics, and Value as Rare Species Habitat**

The touchstone in resolving this appeal is the concept of adverse effect on resource area habitat, which means a greater than negligible change in the resource area or one of its characteristics or factors that diminishes the value of the resource area for wildlife habitat of the rare species. 310 CMR 10.23. Adverse effect in the context of rare species is to the local population of the species. Prior cases have distinguished between an adverse affect and whether a project might cause a physiological response when an individual bird becomes aware of the presence of human activity. See Matter of Town of Plymouth, Docket No. WET-2009-016, Recommended Final Decision (February 18, 2010), adopted by Final Decision (March 16, 2010) (difference between a biological effect, e.g., someone walking down a beach and flushing a Tern, and an adverse effect that diminishes the value of the resource area to a degree shown to negatively affect the local population growth or productivity). While any physical interaction between birds and humans could have a negative impact, a regulatory “adverse effect” involves a causal relationship between the diminution of habitat value and some potentially measurable loss of productivity or survival such as diminished breeding, hatching, chick growth, or longevity. Id. Mr. Burm asserted that the project would cause these effects. Mr. Perkins qualified his opinion, which concurred with the NHESP of “no adverse effect,” with the term “significant.” While this appears to misconstrue the regulatory standard, he clarified during oral testimony that he believed the project met the regulatory performance standard and that if there were any adverse effect, it would not be significant, i.e., it would be negligible.

The resource area where the project will be located is Land Under the Ocean. Mr. Burm testified that he observed during his visit to the site that a portion of the flood tidal delta where the project would be located was exposed at low tide. Burm PFDT, para. 20. Mr. Humphries testified the project would be located below mean low water, as did Mr. Cook and Mr. Gilmore. The NHESP opinion described the project as subtidal. Based on their more precise understanding of the location of the proposed project, I credit the testimony of Mssrs. Humphries, Cook, and Gilmore, and also find that the NHESP opinion is correct on this point. The project site will be below the mean low water line, or subtidal, and does not provide nesting, loafing, or resting habitat for the Terns.[[24]](#footnote-24) The project site provides foraging habitat.

The characteristics critical to the protection of marine fisheries and wildlife habitat identified in the regulations for the resource area Land Under the Ocean are water circulation, distribution of sediment grain size, water quality, finfish habitat, and important food for wildlife. 310 CMR 10.25(1). Water circulation maintains water temperatures and moves nutrients, pollutants, and metabolic waste products, benefitting marine organisms. *A Guide to the Coastal Wetlands Regulations*, Department of Environmental Protection, 1978, p. 12. Maintaining the distribution of sediment grain size is important to bottom-dwelling organisms that are adapted to a specific grain size. Id. Water quality refers to maintaining natural levels of dissolved oxygen, temperature, turbidity, and pollutants. Id. High levels of turbidity may affect benthic invertebrates such as shellfish, decrease light penetration causing a reduction in production of plant material consumed by fish and plankton, and harming fish eggs by interfering with embryonic respiration. Id. Finfish habitat includes the bottom-level community of crustaceans, molluses, and other organisms consumed by finfish, as well as vegetation such as eelgrass where present. Id. [[25]](#footnote-25) These characteristics are critical for supporting the marine fisheries upon which the Terns depend for food. Further, the regulations specifically state that Land Under the Ocean also provides important food for birds. 310 CMR 10.25(1). The important food is the small fish that the Terns require, including the Sand Lance.

The project site within the flood tidal delta area of Popponesset Bay provides the conditions for excellent foraging habitat for the Tern species due to its shallow water and sandy substrate, conditions which are favored by American Sand Lance, a major food source for Roseate Tern in particular. Because the bags containing the oysters are submerged, the Terns may forage over the entire project site. Their feeding is primarily aerial, meaning that they generally fly over the Land Under the Ocean and intermittently come into contact with the ocean at its surface when they dive for fish. The Petitioners have not asserted that the project will interfere physically with the plunge-diving that is the preferred foraging technique. Instead, the Petitioners claim that the construction and operation of the project will disturb the Terns and also the Sand Lance, causing an adverse effect on the Terns’ habitat in contravention of the regulations.

**Effects of Project Construction**

The Petitioners claimed that the installation of the project would adversely affect the Tern habitat. The Applicant and the Department asserted the construction would have no adverse effect. According to the stipulation filed by the parties, each of the 40 lines must be anchored with a minimum of three helical anchors, for a total of at least 120 anchors. Mr. Cook testified that the anchors would be installed by hand, by one person, without noise, in one to two minutes each. Cook Oral Testimony. Thus, Mr. Burm’s testimony that the anchors would be installed by drilling for a concentrated period of a week creating noise and disturbance overstates the impacts of installation of the project. See Burm PFDT, para. 28. The addition of anchors and bags will be gradual. Cook PFDT, para. 9. If all anchors were installed within the first six month, the total time would be only about four hours over 180 days. Although the Petitioners raised the question of whether use of a hydraulic drill would produce noise that could impact the Terns, the project as proposed does not include hydraulic drills. No testimony linked the installation of the project as proposed with any diminution of the resource area to serve as habitat by providing food for wildlife, specifically the small fish the Terns eat. The evidence does not support a conclusion that the installation of the project will have an adverse effect on Tern foraging habitat.

**Effect of Operation of Project on Foraging Habitat: Sand Lance**

Although each party offered a witness with expertise as to Terns, no witness was an expert in marine fisheries or was qualified by education or experience to offer an opinion on the effect of the project on Sand Lance. There appears to be a lack of knowledge as to Sand Lance population abundance generally. Nelson, G., and M. Ross, *Biology and Population Changes of Northern Sand Lance (Ammodytes dubius) from the Gulf of Maine to the Middle Atlantic Bight*, J. Northw. Atl. Fish. Sci. Vol. 11:11-27 (1991), p. 11 (very little known about biology and population of Sand Lance).[[26]](#footnote-26) No witness actually observed Sand Lance at the site, nor is there any evidence that anyone has observed Sand Lance at the site. [[27]](#footnote-27) Instead the presence of Sand Lance was inferred from the conditions and the presence of foraging Terns, particularly the Roseate Tern which favors Sand Lance. Both Mr. Burm and Mr. Perkins testified that Sand Lance would be present at the site. Burm PFDT, para. 33; Perkins Oral Testimony. The expert witnesses differed on whether the project would adversely affect the foraging habitat of the Terns.

The Petitioners allege that the project will affect the use of the habitat by the Sand Lance. Mr. Humphries testified that the workers would disturb the substrate as they walk through the project site at low tide and cause turbidity, distributing fine sediments through the water column. Humphries PFDT, para. 16. Mr. Humphries’ testimony did not identify any specific effects on Sand Lance or other benthic organisms. Mr. Burm testified that the alteration of the sandy substrate by the bags and the workers walking along the aisles will reduce the food supply of Sand Lance for the Terns. Burm PFDT, para. 33. As support for his description of Sand Lance, Mr. Burm cited research that focused on the species *Ammodytes dubius,* which is found in deeper, offshore waters than the species *A. Americanus* that occurs in shallow bays and that was identified as the primary food of the Roseate Tern. Nelson, G., and M. Ross, *Biology and Population Changes of Northern Sand Lance (Ammodytes dubius) from the Gulf of Maine to the Middle Atlantic Bight*, J. Northw. Atl. Fish. Sci. Vol. 11:11-27 (1991), p. 11. The article contains a passing reference to coastal birds but otherwise discusses Sand Lance abundance from the perspective of its consumption by mackerel, herring, and other large fish, and generally addresses various aspects of Sand Lance size and morphological characteristics. The article provides no support for a conclusion that Sand Lance would be affected by an aquaculture project.

Mr. Burm’s conclusion that alteration of the substrate would reduce the supply of Sand Lance or cause the Sand Lance to avoid the shoal altogether lacks factual support. Mr. Burm conceded on cross-examination that he lacked expertise in Sand Lance biology and had seen no study on the effects of aquaculture on Sand Lance populations. An opinion as to the effects of the project on Sand Lance would require expertise in marine fisheries that Mr. Burm has not established he possesses. He conceded that his conclusion that the Sand Lance would have reduced access to the sand for burrowing for protection was based on an incorrect assumption that the bags would rest directly on the substrate. Burm Oral Testimony. The NHESP opinion letter raised the possibility that small fish might be attracted to the site, although it did not so conclude due to insufficient information. Mr. Cook testified that Terns were attracted to his oyster farm in Ockway Bay. Cook Oral Testimony. Thus, it is possible that the project will increase rather than decrease the availability of small prey fish to the Terns.

Mr. Burm testified that decreased food supply from a reduction in foraging effectiveness would adversely affect the breeding success of Roseate and Common Terns. Burm PFDT, para. 34. Mr. Burm cited to research that provided empirical evidence that a reduction in prey populations can limit Tern reproductive success. Safina C., J. Burger, M. Gochfeld, and R. Wagner, *Evidence for Prey Limitation of Common and Roseate Tern Reproduction*, The Condor 90: 852-859 (1988). The researchers established a causal relationship between prey availability and chick survival. Prey abundance and density, however, fluctuated dramatically, from one year to a 50% reduction the next year with no identified cause of the fluctuation. Id. at 853. The research supports Mr. Burm’s opinion that a reduction in prey could compromise the site as foraging habitat. The research on the relationship between prey availability and reproductive success, however, simply does not support a conclusion that a reduction in prey availability could be attributed to a two acre aquaculture operation, or any particular type of project. The research on Sand Lance filed by the Petitioners indicates that abundance depends on abundance of other predatory species such as mackerel and herring. Nelson, G., and M. Ross, *Biology and Population Changes of Northern Sand Lance (Ammodytes dubius) from the Gulf of Maine to the Middle Atlantic Bight*, J. Northw. Atl. Fish. Sci. Vol. 11:11-27 (1991), p. 22-23. The research does not provide support for a conclusion that the Sand Lance population, the relevant prey for the Roseate Terns at the site, will be reduced or affected in any way by Mr. Cook’s aquaculture project.

Sand Lance burrow into the sand, but any conclusion as to the effect of the placement of the bags or the movement of the workers on the Sand Lance, assuming they are present at the site, is speculative. The bags are suspended above the substrate, so that the Sand Lance will be able to swim or burrow beneath them. Cook Oral Testimony. While it may be reasonable to infer that Sand Lances that have burrowed into the sand may be displaced as workers move along the aisles, it is not reasonable to infer, without expert testimony, how far or how long the fish would be dispersed or that any dispersal would negatively affect the food supply for the Terns.[[28]](#footnote-28) In contrast to testimony that the Terns have good recall of their preferred foraging spots, there is no testimony to support a conclusion that Sand Lance or other small fish would recall disturbances at a site and permanently avoid an otherwise suitable habitat.[[29]](#footnote-29)

In sum, the Petitioners have cited no research to support a conclusion that the project would affect the Sand Lance at the site so as to affect its availability as a food source to the terns. The Petitioners have not shown that any turbidity caused by workers walking on the sandy substrate or their movement itself would constitute alteration of the conditions for the Sand Lance that would adversely affect the Tern habitat.[[30]](#footnote-30) The NHESP opinion cited by Mr. Gilmore noted that the project could enhance tern foraging habitat by attracting small fish but could not draw a firm conclusion due to lack of sufficient information. Gilmore PFDT, para. 7 and Ex. 3. Mr. Cook also testified that small fish were attracted to the bags holding the oysters. Cook Oral Testimony. Thus, the evidence also is inconclusive as to whether small fish would be attracted to the project site, and thus a net benefit to the supply of prey for the Terns. The testimony fails to support a conclusion that the project will alter Land Under the Ocean so as to diminish its capacity to provide important food for the Terns by affecting the availability of Sand Lance or other small fish.

**Effects of the Presence of the Workers**

The Petitioners’ expert offered the opinion that the presence of the workers could cause flushing of the Terns, meaning to cause the birds to take flight, or otherwise cause them to respond to disturbance.[[31]](#footnote-31) The workers, however, cannot flush the Terns from the foraging habitat at the site because they are already in flight over the water. Human disturbance of Terns has been identified as a significant threat, but references to disturbance are in the context of nesting or resting Terns. See U.S. Fish and Wildlife Service, 2010, *Caribbean Roseate Tern and North Atlantic Roseate Tern (Sterna dougallii dougallii), 5 year Review Summary and Evaluation,* p. 57. There is no research cited in support of a claim that two people moving at walking speed, or more slowly as the workers tend to the bags of oysters, will cause any effect on foraging Terns. There was testimony from Mr. Gilmore and Mr. Perkins that Terns are not affected by clammers and from Mr. Perkins that feeding Terns are not at all affected by the presence of humans. Because the research did not address human disturbance while birds are foraging in flight, the testimony of Mr. Perkins based on his observations was persuasive.

Mr. Burm testified that the project will “markedly increase the level of human activity” at the site. Burm PFDT, para. 28. He did not acknowledge initially that the site is currently used for recreational activities. Mr. Perkins testified that the recreational activities, particularly kite flying and frisbee tossing, are more likely to disturb the Terns. Perkins Oral Testimony. Certainly the shoreline of Buzzards Bay and Buzzards Bay itself, where the Terns spend the summer nesting and foraging, is well-known for its swimming beaches and boating activity. Popponesset Bay has similar human activities. Hearing Ex. 1, Correspondence from Brian Wall on behalf of Residents Group to Secretary Richard K. Sullivan re Proposed Shellfish Grant, Popponesset Bay (August 13, 2013). Over their lifetimes, returning to the same area, the Terns must routinely fly over humans engaged in various activities. Apparently the recreational activities existing on the flood tidal delta have not resulted in the Terns abandoning the area for foraging because the testimony shows that the Terns frequent the site. Burm PFDT, para. 20.

Mr. Perkins testified that Terns would habituate to the presence of humans, because they are long-lived and repeatedly travel over the same geographic area. Perkins PFDT, para. 10 and Oral Testimony. He testified that Terns loafing on exposed areas would not be disturbed by the work at the project site because Terns habituate to human activity and flush only in response to abrupt or sudden movements. He described Terns as tolerant of the sounds that might occur at the site. Perkins PFDT, para. 10. According to NHESP, Common Terns can distinguish between individual humans, as observed by their differing approaches to familiar and nonfamiliar individuals at their nesting colonies. NHESP Common Tern Fact Sheet. Indeed, the “disturbance” related to human intrusion in the research typically refers to human activities near nesting, loafing, or staging areas, where the Terns are on land rather than in flight for foraging. U.S. Fish and Wildlife Service, 2010, *Caribbean Roseate Tern and North Atlantic Roseate Tern (Sterna dougallii dougallii), 5 year Review Summary and Evaluation,* p. 54. Terns have become tolerant of “hands-on research” at nesting sites, including weighing chicks and trapping adults, but do not allow “such close approach” at staging sites. Id. The disturbance at staging sites was identified as resulting from approach by pedestrians, dogs, and vehicles. Id. The workers will not “approach” the Terns when they are foraging.

While it may be true that continuous human activity over the entire project area would disturb foraging, each worker will occupy only a small amount of space at any given time. From the perspective of the Terns foraging overhead, the presence of the workers would appear to be negligible, particularly where there is no evidence that a foraging Tern is disturbed by people below. [[32]](#footnote-32) The testimony of Mr. Perkins, based upon his first-hand experience with observing Terns, is more persuasive where the research does not support any conclusion as to the effects of an aquaculture project. There is evidence that Terns live for 20 years, will visit the site repeatedly, will recall the site on subsequent visits, and will become habituated to activities at the site. Although the area is currently used extensively for recreation, there is no evidence that the activity has affected the foraging of the Terns. The testimony does not support a conclusion that the presence of workers at the project site will have an adverse effect on the Tern habitat.

**Noise as an Adverse Effect**

The Petitioners allege noise from the installation or operation of the project would adversely affect the Terns. The Petitioners focused on noise that could be generated by use of the electrical sorter. The Petitioners supported this view with a study involving airboats that flushed foraging or loafing waterbirds, disturbing their feeding. The airboats apparently had aircraft engines and approached the birds at 35 km/hr or 21 mph. Rogers, J.A., Jr. and S.T. Schwikert, *Buffer Zones Distances to Protect Foraging and Loafing Waterbirds from Disturbance by Personal Watercraft and Outboard-Powered Boats*, Conservation Biology 16:216-224 (2002). The airboats caused the birds to interrupt their feeding and take flight. However, the research is not applicable to the circumstances of this project site. First, as Mr. Perkins and Mr. Gilmore note, the birds described in the research are wading birds that may be flushed, in contrast to the plunge-diving Terns that are in flight while feeding. Terns were not studied, and the article notes their tendency toward habituation. Id. Second, the noise of an aircraft engine discussed in the research appears to far exceed any noise generated by the oysters shells knocking against each other as they are sorted.

Finally, when noise generated by a project has been asserted as an adverse impact in prior wetlands appeals, the Department has found that noise impacts are generally not cognizable under the Wetlands Protection Act or its regulations. See Matter of Town of Milton, Docket No. WET-2011-030, Recommended Final Decision (March 29, 2012), adopted by Final Decision (April 4, 2012); Matter of Horne, Docket No. WET-2010-015, Recommended Final Decision (September 23, 2011) (claims regarding light, noise, and pollution not justiciable or cognizable under the Act), adopted by Final Decision (November 2, 2011); Matter of National Development and NDNE Lower Falls, LLC, Docket No. WET-2008-073, Recommended Remand Decision (January 26, 2009) (same), adopted by Decision adopting Recommended Remand Decision (January 28, 2009); Matter of W.J.G. Realty Trust, Docket No. 2002-145, Recommended Final Decision (April 22, 2003), adopted by Final Decision (May 12, 2003) (“prevention of pollution” interest under the Act did not include claims alleging air or noise pollution from project); Matter of Town of Nantucket, Docket No. 87-156, Final Decision (July 15, 1988) (claims of noise, odor, and air pollution not justiciable or cognizable under the Act); Matter of Hanover, Docket No. 31-117, Dismissal (August 24, 1983) (claims of noise pollution not justiciable under the Act); cf. Varian Semiconductor, Docket No. 2007-049, Recommended Final Decision (June 14, 2007) (appeal dismissed when the noise and mechanical operation of wind turbine above the vernal pool were not “alleged to be related to the wetlands functions of the BVW in providing habitat . . . .” ), adopted by Final Decision (June 15, 2007); see also Lovequist v. Conservation Commission of Town of Dennis, 379 Mass. 7, 14, 393 N.E.2d 858, 863 (1979) (a local ordinance that had the “dominant purpose” of protecting wetlands and “wetland values” did not include the regulation of air pollution and noise).[[33]](#footnote-33) Noise, as sound for humans or animals, is regulated under the Clean Air Act. See 310 CMR 7.00 (“Noise means sound of sufficient intensity and/or duration as to cause or contribute to a condition of air pollution.”) and 310 CMR 7.10; Department Policy 90-001; G.L. c. 111 §§ 142A-O.[[34]](#footnote-34)

Even if noise were a habitat characteristic subject to regulation, the testimony does not support a conclusion that the noise generated by the project would cause an adverse effect on the rare species habitat. The record supports a conclusion that a sufficiently loud, abrupt noise may disturb loafing Terns, such as rapidly approaching boat with the equivalent of a jet engine, but the noise from the project is not comparable. Further, the project site is foraging habitat, not loafing or resting habitat. The testimony supports a conclusion that when the Terns are feeding, they focus on that activity and are not distracted by other potential disturbances around them as might occur with nesting, loafing, or resting Terns. Perkins Oral Testimony. Mr. Perkins testified that Terns are tolerant of such sounds and do not require habituation. Perkins Oral Testimony. The Petitioners have not shown an adverse effect on Tern habitat from project noise.

**Effect of the Project on Migratory Habitat**

Popponesset Bay generally is a staging area for Terns, and is therefore part of their migratory habitat.[[35]](#footnote-35) Burm PFDT para. 14, Trull, P.,S. Hecker, M.J. Warson, and I.C.T. Nisbet, *Staging of Roseate Terns Sterna dougallii in the Post-Breeding Period Around Cape Cod, Massachusetts, United States*, Atlantic Seabirds 1:145-158 (1999), at 148. A staging area is used by Terns during daylight hours in the period between breeding and southward migration, either feeding in adjacent waters or flying to or from more distant feeding areas. Id. at 147. According to the research, it is uncertain whether staging areas are selected because they offer minimal risk of disturbance by predators or humans, or because they are close to feeding areas, or both. Id. at 154. For purposes of wetlands jurisdiction, the project site in Land Under the Ocean serving as foraging habitat also serves as foraging habitat during the staging period as part of the Terns’ migratory habitat.

The Petitioners point to research that identifies human disturbance at staging areas. Of the 20 staging sites studied in the cited research, disturbances caused by human pedestrians, beach vehicles, aircraft, boats, and dogs were identified at 16 sites. Id. at 153. Roseate and Common Terns have been reported to be less tolerant of human activity during the post-breeding period. U.S. Fish and Wildlife Service. 2010, *Caribbean Roseate Tern and North Atlantic Roseate Tern (Sterna dougallii dougallii) 5 year Review Summary and Evaluation*, p. 54. Thus, although the function of the resource area as foraging habitat is the same, the effects may differ during migration. Human disturbance of Roseate Terns during staging was specifically identified by the U.S. Fish and Wildlife Service as a “new threat that warrants further study,” particularly because the northeast Roseate Tern population is congregated in southeastern Massachusetts during the post-breeding staging period prior to migration. Id., p. 67. However, the human disturbance involves approaches toward loafing or resting Terns, not foraging Terns in flight. The current research does not support a conclusion that an aquaculture project in an area used by Terns for foraging will disrupt their staging. The project site would continue to serve as foraging habitat as the birds feed during their staging period. Although large numbers of Terns might congregate on Popponesset Spit or the exposed area of the flood tidal delta during staging, the experts did not describe other bird behavior that would occur at the project site itself during staging other than foraging.

**Conditions Proposed by the Petitioners**

In their closing brief, the Petitioners argued that the project would have an adverse effect on rare species habitat and should not be permitted. However, they argued that if the project were to be approved, additional conditions were warranted to prevent adverse effects on Tern habitat. Specifically, they sought a limitation of 3,000 bags, a limitation of two workers between April and September 15, a maximum of two boats, a 100 foot setback from areas of the flood tidal delta exposed at low tide, eliminating use of the electric sorter between July 1 and September 15, and a prohibition on hydraulic drills for installation of the anchors holding the project in place. Petitioner’s Post-Hearing Supplemental Memorandum. The project is limited under the SOC to no more than 4,500 bags within the 1.99 acre grant. The Petitioners pointed out that these limitations are consistent with the description provided by Mr. Cook of how he intended to operate the project.

First, NHESP did not impose any conditions for purposes of its determination that the project met the standard under the Massachusetts Endangered Species Act regulations, 321 CMR 10.00. See Matter of Christopher Bryant/Greenport Consulting, Inc., Docket No. WET-2011-007, Recommended Final Decision (July 27, 2011), adopted by Final Decision (September 2, 2011)(condition added by NHESP were a “no-wake rule for boat servicing an aquaculture facility, a time of year limitation for installation of a mooring system, and a prohibition on nets, all to avoid a “take” of endangered Diamondback Terrapin). The conditions proposed by the Petitioners appear to intrude on the jurisdiction of NHESP to the extent they would protect the Terns themselves rather than to protect Tern habitat. Second, the imposition of these conditions would be inconsistent with the presumption that NHESP’s opinion that the project as proposed will have no adverse effect on rare species habitat. After evaluation of the evidence presented, I have concluded that the project as proposed meets the regulatory standard.

While it is appropriate to take a conservative approach to the protection of rare species, the Petitioners’ conditions will not necessarily have their intended effect. For example, three workers in three boats might lead to less time spent on the water. Limiting the number of boats for the aquaculture project seems unwarranted where there is no evidence the foraging Terns are disturbed by boats. A prohibition on aquacultural activities within 100 ft of areas exposed at low tide would be incommensurate with the existing recreational activities that are currently taking place directly on the areas exposed at low tides.[[36]](#footnote-36) Portions of the flood tidal delta that are exposed at low tide are ‘regularly used” to beach kayaks, swim, walk, picnic, fly kites and fish. Hearing Ex. 1, Correspondence from Brian Wall on behalf of Residents Group to Secretary Richard K. Sullivan re Proposed Shellfish Grant, Popponesset Bay (August 13, 2013). Even if the sound were to be considered as part of Land Under the Ocean habitat, I am not persuaded that the noise of oyster shells tumbling against each other as they pass through a sorter would disturb the foraging Terns. Mr. Cook has not proposed the use of a hydraulic drill to install the anchors, and the recommended tool for this task appears to be a metal bar which can accomplish their placement in minutes. Mr. Cook has described his project as requiring no motors beyond the outboard boat engine and electric sorter or winch. Notice of Intent, 2/28/2012. For these reasons, I have not recommended additional conditions for approval of the proposed project.[[37]](#footnote-37)

**CONCLUSION**

For the reasons stated, I conclude that Mr. Cook’s proposed aquaculture project will not have an adverse effect on the wetlands resource area habitat of the Roseate Tern, the Common Tern, or the Least Tern, either from its installation or its operation. I recommend that the Department’s Commissioner issue a Final Decision that would sustain the SOC, with the addition of the conditions in the stipulation filed by the parties.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Pamela D. Harvey

Presiding Officer

## NOTICE- RECOMMENDED FINAL DECISION

This decision is a Recommended Final Decision of the Presiding Officer. It has been transmitted to the Commissioner for his Final Decision in this matter. This decision is therefore not a Final Decision subject to reconsideration under 310 CMR 1.01(14)(e), and may not be

appealed to Superior Court pursuant to M.G.L. c. 30A. The Commissioner’s Final Decision is subject to rights of reconsideration and court appeal and will contain a notice to that effect.

Because this matter has now been transmitted to the Commissioner, no party shall file a motion to renew or reargue this Recommended Final Decision or any part of it, and no party shall communicate with the Commissioner’s office regarding this decision unless the Commissioner, in his sole discretion, directs otherwise.

1. In this Recommended Final Decision, my references to “Terns,” capitalized and plural, refer collectively to Roseate, Common, and Least Terns. I have distinguished them by species where relevant.

   [↑](#footnote-ref-1)
2. A Barrier Beach is a narrow, low strip of coastal beach and dunes roughly parallel to the coast, separated from the mainland by a body of water or marsh, and joined to the mainland at one or both ends. 310 CMR10.29(2). [↑](#footnote-ref-2)
3. A tidal delta is the accumulation of sand on the ocean or shore side of an inlet; a flood tidal delta is formed by the flood, or incoming, tide and is located on the landward side of an inlet. [↑](#footnote-ref-3)
4. “Loafing” as to birds apparently describes the same behavior as to humans, meaning not engaged in any other activity, similar to “resting.”

   [↑](#footnote-ref-4)
5. The effect of the project on Piping Plover habitat was not an issue in this appeal because Piping Plover forages on beaches. A third Tern species, the Arctic Tern, *Sterna paradisaea,* is listed under the Massachusetts Endangered Species Act, but is not an issue in this appeal. [↑](#footnote-ref-5)
6. The NHESP Fact Sheets include a photograph of each Tern species. The Tern species are similar in appearance but the Roseate Tern has very long tail streamers and the Least Tern is considerably smaller than the Roseate Tern and Common Tern, which are similar in size. For a single page view of all Terns, in addition to detailed drawings of each species, see Sibley, David Allen, The Sibley Guide to Birds, Alfred A. Knopf, New York (1st Ed. 2000), p. 203 and pp. 232, 235, and 236. A pair of Roseate Terns, along with the Right Whale, is depicted on the Massachusetts “Preserve the Trust” environmental license plate.

   [↑](#footnote-ref-6)
7. For purposes of comparison, the familiar Robin is about ten inches in length. [↑](#footnote-ref-7)
8. For Common Terns, there were 30,000 nesting pairs by the 1920s, 7,000 by the end of the 1970s, and 15,447 in 2005. For Roseate Terns, there were 8,500 nesting pairs in 1930, 2,500 by 1979, 4,310 in 2,000, and 3,320 in 2006. For Least Terns, there were 1,500 nesting pairs in the 1950s, 900 in the early 1970s, and 3,420 in 2001. The decline in the population of Roseate Terns is a particular source of concern. NHESP Fact Sheets. [↑](#footnote-ref-8)
9. Roseate Terns in particular are the subject of research to assess their status and ensure their protection. See U.S. Fish and Wildlife Service, *Caribbean Roseate Tern and North Atlantic Roseate Tern (Sterna dougallii dougallii), 5 year Review Summary and Evaluation* (2010). Information on NHESP research is available at http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/rare-birds/buzzards-bay-tern-restoration-project.html.

   [↑](#footnote-ref-9)
10. A reference to a NHESP Fact Sheet following a discussion of a particular Tern species refers to the Fact Sheet for that species.

    [↑](#footnote-ref-10)
11. The Nelson and Ross article on *Ammodytes dubius* was filed by the Petitioners. Because Popponeset Bay is nearshore, the species of Sand Lance at the project site would be expected to *Ammodytes americanus.*  The parties did not address this distinction and it does not appear to be material to the resolution of the appeal. I have referred generally to Sand Lance except as noted. [↑](#footnote-ref-11)
12. Mr. Cook filed with the Commission a publication of the Cape Cod Extension Service noting the capacity of oyster aquaculture to improve water quality degraded by excess nutrients, a serious problem for many coastal embayments with developed watersheds. Notice of Intent, 2/28/2012.

    [↑](#footnote-ref-12)
13. The terms “cages” and “bags” were both used in the record to denote the containers for the oysters that will be attached to the lines. I have used the term “bags” to distinguish them from the “cages” also used in aquaculture where rigid wire boxes are placed directly on the seafloor for shellfish aquaculture. [↑](#footnote-ref-13)
14. Water depth at the site is 1.1 to 2.7 feet below mean low water. SOC Plan. Assuming the bags are about six inches below the surface and three to four inches high, they would be three to four inches about the substrate at mean low water where the water depth is most shallow.

    [↑](#footnote-ref-14)
15. This figure apparently represents the number of bags multiplied by the approximate size of each bag in square feet, or 4,500 x 4.5. [↑](#footnote-ref-15)
16. The type of anchor is identified in the stipulation. [↑](#footnote-ref-16)
17. Ockway Bay is a sub-embayment of Popponesset Bay to the northwest of the project site, where Mr. Cook has conducted shellfish aquaculture for about 20 years. [↑](#footnote-ref-17)
18. It is not clear whether the sorter that Mr. Cook proposed to use at this time differed from the sorter discussed at the hearing, which was quiet but the movement of the oysters resulted in some noise. [↑](#footnote-ref-18)
19. The parties did not address the question of whether a project conducted in a wetlands resource area extends the Department’s jurisdiction to the air above when the project extends into the air above, as occurs here where the workers are above the water surface. The circumstances presented here differ from the more usual situation where, for example, a project to construct a pier will cause shading that will directly affect the wetlands resource area, clearly establishing jurisdiction. [↑](#footnote-ref-19)
20. Paragraphs 14 and 15 of Mr. Humphries PFDT were withdrawn because they address the issue that was resolved by stipulation. [↑](#footnote-ref-20)
21. “Clammers” refers to individuals harvesting clams by hand in shallow water, typically using rakes. [↑](#footnote-ref-21)
22. Ms. Mostello was the author of the Fact Sheets on the three rare Tern species and has been actively involved in the Tern nesting habitat restoration project in Buzzards Bay. NHESP Fact Sheets. Thus, she appears to have considerable expertise as to Terns. I note that the regulatory procedures as to rare species in the Wetlands Regulations are designed in part to rely on written NHESP opinions in lieu of more resource-intensive appearances by NHESP staff as witnesses. [↑](#footnote-ref-22)
23. Although I conclude that the Petitioners’ expert testimony did not establish an adverse effect on the habitat of the Terns, I also examined the facts and research fully given the strictness of the performance standard and the importance of the Department’s role in the protection of rare species habitat. See Matter of James Love, Docket No. 96-100, Tentative Final Decision (April 3, 1998). [↑](#footnote-ref-23)
24. The portion of the horseshoe shaped sand bar exposed at low tides appears to be a tidal flat. Tidal flats are a subset of another resource area, Coastal Beach, and extend above mean low water landward. 310 CMR 10.27(2). The provision at 310 CMR 10.24(2), which was not identified as an issue for adjudication, addressing situations where a project in one resource area may affect another resource area. The witnesses did not provide testimony on the distance between areas exposed at low tides and the project site, the size of the exposed area, or the amount of time during the tidal cycle that the area is exposed. Thus, the Petitioners references to this exposed area are insufficient to support a conclusion that activities at the project site will adversely affect habitat there**.** Similarly, Popponesset Spit is another resource area, a Barrier Beach, but the testimony does not support a finding that activities at the project site will adversely affect this area more than 600 feet away, even assuming the activities would adversely impact the habitat there if closer. The Massachusetts Audubon Society owns a portion of the Spit and sent a letter to the Mashpee Conservation Commission dated May, 23, 2012 urging a careful evaluation of the potential for impacts from the project on bird habitat. It stated that the project will alter the foraging habitat and the impacts may be “positive, negative, or inconsequential.” The letter was attached to the Petitioners’ request for an SOC and therefore included in the record of this appeal.

    [↑](#footnote-ref-24)
25. Notably, these characteristics that support shellfish naturally occurring on Land Under the Ocean are important to the growth of Mr. Cook’s oysters and the ultimate success of his project, as shellfish production requires good water quality. [↑](#footnote-ref-25)
26. A recent article in the Boston Globe reported the relationship between whales and the presence of Sand Lance on Stellwagen bank, noting the lack of knowledge about Sand Lance abundance or movements. Whale-Watchers in Humpback Bliss, Influx of food draws bounty of mammals to Stellwagan (sic) Bank. Boston Globe, May 22, 2014. [↑](#footnote-ref-26)
27. The survey conducted by DMF did not indicate observations of Sand Lance, but it was conducted in January when Sand Lance may not have been present at the site. [↑](#footnote-ref-27)
28. In contrast to the Terns, where there was testimony that they may live for twenty years, migrate to South America, and recognize foraging locations, there is no evidence related to how or whether Sand Lance comprehend their environs to the extent that they would recall and avoid a particular site.

    [↑](#footnote-ref-28)
29. Literature cited in the research article filed by the Petitioners did contain a description of interaction between American Sand Lance and humans, although the researchers were interested in schooling behavior and speed, not fish-human interaction. The study described observations by divers of the behavior of American Sand Lance on Stellwagen Bank and the Provincetown slope. Meyer, Thomas L., Richard A Cooper, and Richard W. Langton, *Relative Abundance, Behavior, and Food habits of the American Sand Lance, Ammodytes Americanus, from the Gulf of Maine*, Fishery Bulletin: Vol. 77, No. 1, 1979, p. 248-249, cited in Nelson, G., and M. Ross, *Biology and Population Changes of Northern Sand Lance (Ammodytes dubius) from the Gulf of Maine to the Middle Atlantic Bight*, J. Northw. Atl. Fish. Sci. Vol. 11:11-27 (1991), p. 25-27. The large schools of American Sand Lance when approached by divers accelerated to one side or split to avoid the divers. Id. The avoidance maneuvers, however, lasted only a few seconds until the Sand Lance resumed their original speed and direction. These observations of American Sand Lance suggest that the presence of workers might cause some ephemeral modification of their movement to avoid the workers prior to immediately resuming their course.

    [↑](#footnote-ref-29)
30. The Petitioners allege that the project would cause erosion or accretion at the site, but did not quantify these effects. The US F&W study identified sand mining from sand bars or shoals in areas of shallow water used by foraging Terns as a threat to Tern habitat because the alteration of the depth could render the area less favorable for Terns. U.S. Fish and Wildlife Service, 2010, *Caribbean Roseate Tern and North Atlantic Roseate Tern (Sterna dougallii dougallii), 5 year Review Summary and Evaluation,* p. 56. However, the Petitioners did not allege that water depths over the shoal would change, and certainly not to an extent that would even remotely compare to sand mining.

    [↑](#footnote-ref-30)
31. The parties viewed the workers as part of the project that would affect the habitat. For purposes of resolving this appeal, I have similarly accepted the workers as part of the proposed project. In the context of managing beaches to protect rare avian species, the state has taken the position that certain activities of individuals are not subject to jurisdiction under the Wetlands Protection Act. The activities identified are related to impacts of individual recreational users, “pedestrians, joggers, sun-bathers, picnickers, fisherman, boaters, horseback riders or other users . . . are not subject to the jurisdiction of the Wetlands Protection Act because they are not considered to be alterations of wetlands resource areas.” Instead, the guidelines for these activities, which include refuge areas around nests, “should be applied in reference to the Massachusetts Endangered Species Act.” Guidelines for Managing Recreational Use of Beaches to Protect Piping Plovers, Terns, and their habitats in Massachusetts, Appendix H of the Guidelines for Barrier Beach Management in Massachusetts (February 1994), issued by the Massachusetts Barrier Beach Task Force. See Matter of Town of Plymouth, Docket No. WET-2009-016, Recommended Final Decision (February 18, 2010), adopted by Final Decision (March 16, 2010). In contrast, vehicle use is considered an alteration and is regulated under the Wetlands Protection Act. Id. [↑](#footnote-ref-31)
32. For perspective on the scale of the presence of the two workers on the 1.99 acres or 86,684 sq. ft. grant area, the percentage occupied by the workers would be .002%, assuming each worker occupied two sq. ft., and the project site is just a fraction of the size of the flood tidal delta. See USGS Topographic Quad (showing horseshoe-shaped shoal and the project site). An acre is 43,560 sq. ft., slightly smaller than a football field at 48,000 sq. ft. (without the end zones). [↑](#footnote-ref-32)
33. The Act defines “wildlife habitat” as “those areas subject to [the Act] which, due to their plant community composition and structure, hydrologic regime or other characteristics, provide important food, shelter, migratory or overwintering areas, or breeding areas for wildlife.” G.L. c. 131 § 40 (¶ 19) (emphasis added). With the addition of “wildlife habitat,” the “resource areas that are protectable under [the Act] stay the same, only the reasons for their protection are different by adding this wildlife habitat value. In other words, this amendment does not make [the Act] a wildlife habitat protection statute.” Matter of Meadows at Marina Bay, LLC and Marina Bay Co., Inc., supra. To be part of the wildlife habitat interest under the Act, a characteristic must be related “to the vegetative, hydrologic or other characteristics that make the wetland in question a jurisdictional wetland under G.L. c. 131 § 40.” Matter of Meadows at Marina Bay, LLC and Marina Bay Co., Inc., Docket No. 98-006, Final Decision (February 18, 1999). Wildlife habitat includes “certain physical characteristics” that are “particularly prevalent and/or valuable in wetland resource areas,” although they may be found in nonwetland areas. Id. Sound and noise were not intended to be a habitat characteristic to be regulated under the Act or the Wetlands Regulations. [↑](#footnote-ref-33)
34. “Air pollution” is the “presence in the ambient air space of one or more air contaminants or combinations thereof in such concentrations and of such duration as to . . . be . . . potentially injurious to human or animal life, to vegetation, or to property.” 310 CMR 7.00 (emphasis added). An “air contaminant” is any “substance or man-made physical phenomenon in the ambient air space and includes, but is not limited to, dust, flyash, gas, fume, mist, odor, smoke, vapor, pollen, microorganism, radioactive material, radiation, heat, sound, any combination thereof, or any decay or reaction product thereof.” Id. (emphasis added). [↑](#footnote-ref-34)
35. For purposes of the statutory definition of “wildlife habitat,” staging areas appear to be a subset of migratory habitat because they constitute the earliest habitat for bird migration. [↑](#footnote-ref-35)
36. The areas exposed at low tide would appear to be Commonwealth property where NHESP or the Division of Fisheries and Wildlife could manage the uses if necessary. [↑](#footnote-ref-36)
37. I considered recommending a condition that would require shifting the project footprint if any portion becomes exposed due to a change in shoaling of flood tidal delta, but the project is approved as described in the Notice of intent and supplemental filings, and the growing method precludes use of tidal flats. Revisions to the proposed project may require a request for an amendment or a new Notice of Intent. Finally, I note that the DMF letter specifically states that DMF may further condition the license it issued at any time if necessary to protect shellfish or other natural resources. DMF is in the best position to assess the status of Sand Lance and could add conditions to the project if future research indicates Sand Lance is affected in any way by shellfish aquaculture. [↑](#footnote-ref-37)