

## **Commercial Fishing in Nantucket Sound: Considerations pertinent to the proposed wind farm on Horseshoe Shoal**

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### ***Introduction***

The Massachusetts Fishermen's Partnership (MFP) held a focus group in Hyannis on April 2, 2004 to hear from representatives of each of the fishing sectors that traditionally fish in Nantucket Sound. Participants were interviewed and asked to mark charts of the Sound showing customary areas of commercial fishing. Dr. Ryznar worked at a computer with the individuals to digitize the detailed information so that geographic information systems (GIS) could be used to visualize, analyze and display the fishermen's knowledge of the Sound. Later, fishermen of Provincetown convened their own meeting (without the presence of social scientists) and similarly marked charts to show where they usually fish in the Sound. Dr. Ryznar digitized the information from the charts that these fishermen provided.

The information collected at these two meetings was supplemented with landings data from Massachusetts Division of Marine Fisheries and some additional information gathered from other fishermen. Mitigation of negative impacts on the fishing industry and fishing communities is one of the national standards codified in the Magnuson-Stevens Fishery Management and Conservation Act with regard to fisheries regulations. A prerequisite to mitigation, however, is a thorough analysis of the potential for such impacts. This report is intended to convey the input of the focus group participants, and to relate their consensus of the need to warn of the potential impacts of the wind farm project.

The determination of whether or not the halting or impairment of mobile fishing effort on Horseshoe Shoal will cause the loss of income to a few or many is an important part of impact analysis. However, a project's impact should also be considered in the context of other changes that may result in cumulative impacts with more serious consequences than any single project or regulation. For example, federal fisheries regulations have severely limited the time fishermen are allowed to fish (days at sea) for groundfish, so access to inshore areas with species other than groundfish is significantly more important than in the past. Consequently, any restriction in access to the Horseshoe Shoal area is potentially more deleterious than it would be if fishermen faced no other restrictions.

However, if the wind farm is indeed constructed on Horseshoe Shoal and established commercial fishing practices are prevented or impeded, mitigation should be considered. This would require negotiation with state or federal fishery management agencies, but it might be feasible to trade, for example, the Horseshoe Shoal area for an area currently closed to fishing.

The predictions of potential impacts identified in this report are a compilation of those expressed by the focus group participants and do not necessarily reflect the opinions of the authors or of the institutions or programs with which the authors are affiliated.

### ***Fishing Communities***

In the views of the fishermen interviewed, placement of the wind towers would make navigation of mobile fishing gear between the towers hazardous or impossible.<sup>1</sup> Information collected suggests that mobile gear fishing vessels from Woods Hole, Cotuit, Hyannis, and Provincetown would be displaced. According to the Massachusetts Division of Marine Fisheries, 1,162,529 pounds of squid and fish were harvested in 2000 by mobile gear fishing vessels working in Nantucket Sound. According to the fishermen interviewed who fish in the Sound, a major portion of their catch is from Horseshoe Shoal. Reduction or loss of access to Horseshoe Shoal could displace fishing effort to other areas in and near Nantucket Sound. Again, according to the fishermen interviewed, this raises the potential for crowding, gear conflicts and habitat impacts elsewhere in the Sound, thereby affecting, albeit indirectly, additional fishermen and a broader range of fishing communities.

Governing board members of the Massachusetts Fishermen's Partnership who fish in Nantucket Sound requested at least one fisherman from each gear type and target species who work in the area be interviewed and/or participate in the focus groups. These individuals were asked to address not only their own interests, but also the interests of other fishermen of their category when discussing the proposed project. These fishermen identified vessels from Woods Hole, Cotuit, Hyannis, and Provincetown that regularly fish in the Sound and they noted that many of the fishermen who work in the Sound are carrying on a multi-generational family tradition.

### ***Fish Species***

The primary commercial species that are sought in the Sound include:

- Bluefish (*Pomatomus saltatrix*),
- Black sea bass (*Centropristis striata*)
- Bonita (*Sarda sarda*)
- Mackerel (*Scomber scombrus*)
- Scup (*Stenotomus chrysops*)
- Striped bass (*Morone saxatilis*)
- Squid (*Loligo & Illex*)

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<sup>1</sup> See diagrams submitted by William Amuru.

- Summer flounder (*Paralichthys dentatus*), also known as fluke
- Tautog (*Tautoga onitis*).

In addition, shellfish such as conch (Knobbed whelk (*Busycon carica*), North Atlantic whelk, (*Buccinum undatum*) channeled or lightning whelks, quahogs (*Mercenaria mercenaria*), and lobsters (*Homarus americanus*) are also harvested in the Sound. Recreational fishermen catch striped bass and bluefish. Currently, there is no directed commercial lobstering on Horseshoe Shoal in the Sound; however, lobsters are caught and landed from large areas of the Sound by other fishermen. Furthermore, some fishermen suggest that lobsters migrate across the shoals at various times of the year. Recently, the deepest section of the Sound was found to be a breeding area for elvers.

## **Gear**

The gear used by commercial and recreational fishermen in the Sound include:

- Otter trawls (for squid, fluke, sea bass and scup)
- Hooks (commercial and recreational)
- Conch pots
- Fish pots
- Lobster pots
- Shellfish drags and dredging gear
- Fish weirs in shallow areas (15-20 feet)
- Gillnets- (only a few fishermen with bait licenses set 300 feet of gillnet to catch menhaden.)

## **Landings and Income**

Finfish landings are limited by the New England Fishery Management Council's Multispecies Fisheries Management Plan that places a maximum quota of 500 pounds per day on commercial groundfish vessels. Nevertheless, the fishermen who traditionally fish in the Sound estimate that 50 to 60% of their annual income is from the Horseshoe Shoal area. Before the recent regulations, the quota was 2000 pounds/day and prior to that, there was no limit. With the reductions on allowable groundfish landings and days at sea, the interviewed fishermen claim access to Horseshoe Shoal for non-groundfish species is even more important economically than it was in the past.

Commercial fluke (summer flounder) landings were estimated to be approximately \$2 million annually. Recreational fishing for fluke also has a significant economic value to the region.

Processing plants in Rhode Island and elsewhere rely on squid caught in the Sound. Though fishermen are not able to fish the Sound in the winter, the squid caught in season is more abundant than the plants can process and sell, therefore, a portion is frozen and stored so the processing plants are able to maintain a year-around operation.<sup>2</sup>

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<sup>2</sup> O'Leary, John, 2004. Point Judith (Draft) Infrastructure Report.

The most recent data that gives insight into the quantities and values of fish harvested in Nantucket Sound are the Massachusetts Division of Marine Fisheries figures for the 2000 fishing year. (Caveat: These are preliminary figures, some quantities may change as they are verified.)

Species	Vessels	Gear	Landings (in pounds)
Squid (Loligo, Ilex & unspecified)	34	Trawl	637,522
Fluke	58	Trawl	508,785
		Hand line	63,598
		Trap	707
		Scottish Seine	100
Conch (Channeled, Knobbed, Lightening whelk and unspecified)	17	Trawl	16,222
		Fish Pot	4,667
		Lobster Pot	1,382
	39	Conch Pots	1,078,956 *
Striped Bass			12,537 (July-Sept)
Black Sea Bass	35	Pots	625,902 *
Atlantic Mackerel		Weir	430,785
Squid		Weir	322,608
King Mackerel		Weir	151,615
Scup		Weir	76,693
Butterfish		Weir	12,464
Bluefish		Weir	11,076
Spanish Mackerel		Weir	11,046
Fluke		Weir	3,924
Albacore		Weir	1,363
Bonito		Weir	356
Tautog		Weir	51
Amberjack		Weir	27
Weakfish		Weir	18
Bay scallop (without shell)			17,813
Bay scallop (with shell)			28,068
Littlenecks			200
Mixed quahogs			3,985
Mussels			8,548,273
Sea clams			12,816,980
Soft shell clams			42,285
Sea scallops (without shell)			413

\* From state catch report data

Estimates of the numbers of recreational angler trips are in the hundreds of thousands, according to the Vincent Malkoski, Massachusetts Division of Marine Fisheries.

### **Season**

Spring through fall is when most commercial fishing takes place. According to one fisherman, “May to December there’s someone making money all the time . . . There is not much activity on the Sound in the winter.”

### **Bottom Type**

Fishermen noted that the vast majority (90%) of the Sound is sandy and the sand ridges that form seem to “hold a lot of fish.” Some fishermen noted that there are pockets of mud, usually in the deepest portions of the Sound. The DEIS released by the Army Corps of Engineers confirms the predominance of sandy sediments and “sand waves,” as well as the existence of subsurface deposits of clay, silt, shell-hash, gravel and/or cobble. “A large field of sandwaves extends across the southern half of the Shoal” and small fields to the north. Typically, the heights of the waves averaged 4 to 5 feet, but some as high as 15 feet were found, according to the DEIS.<sup>3</sup>

### **Impacts of the Proposed Wind Farm On:**

#### **Fishing**

The consensus of those interviewed for this project is that if the wind farm is built as planned, it will close the most productive portion of the Sound’s fishing grounds to the mobile gear fishing fleet. They claim the footprint would take up about 1/3 of the active vessels’ fishing grounds, but could diminish their landings by two-thirds. Asked if why they couldn’t simply fish in the areas that would remain open, the fishermen emphatically said, “That is not where the fish are!” Also, Massachusetts’ three-mile restriction on dragging already eliminates some areas for mobile gear.

The DEIS notes that relatively few scientific studies of finfishing in Nantucket Sound have been published.<sup>4</sup> While relying primarily on the Massachusetts Division of Marine Fisheries (MDMF) trawl surveys, the DEIS noted that the timing of the surveys does not adequately account for the abundance and distribution of finfish over the entire year.<sup>5</sup> MDMF biologist, Vincent Malkoski, noted that the Massachusetts compilation of data for landings and values is incomplete.<sup>6</sup> The fishermen who were interviewed are concerned that an inaccurate or incomplete depiction of commercial fishing in Nantucket Sound and Horseshoe Shoal underestimates the potential impacts of the proposed project to the commercial fishing industry.

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<sup>3</sup> Section 5.1.3, page 9

<sup>4</sup> Section 5.4.2.1, page 5

<sup>5</sup> Section 5.4.3, page 5

<sup>6</sup> Personal communication.

The fishermen interviewed believe that the design of the wind farm precludes the possibility of towing between the towers. Gear is towed at distances up to 1000' or more behind the boat, according to these fishermen. "It is impractical to think that you know exactly where the head is, considering the way the tide goes, the way the boat goes . . . ." The tide and currents are strong and constantly moving the gear, sometimes in unanticipated ways. Moreover, the grid pattern of the farm could lead to dangerous gear conflicts between mobile fishermen according to participants.<sup>7</sup> It should be noted, however, that many fishermen have proven remarkably capable of maneuvering around obstructions.

Fishermen fear that if they are forced out of this productive area, they may crowd other fishermen. For example, one fisherman noted that he already has to go lobstering in June rather than July because of sea bass closures,<sup>8</sup> so if he is forced out of the Sound, he may have to spend more time lobstering. Other fishermen noted that if the mobile gear fleet is forced off Horseshoe Shoal, they "most certainly will fish closer to shore amongst the smaller hook fleet." Such displacement could increase the potential for gear conflicts.

Fishermen have worked out ways to communicate with each other to minimize gear conflicts in the Sound in general and on Horseshoe Shoal in particular. They believe the wind farm construction could create new conflicts by disrupting the traditional fishing patterns.

## **Bottom**

Prior to the release of the DEIS, some fishermen wondered if the structures would cause erosion, given the strength of the currents and the effects of jetties on coastal erosion. It was speculated that this could also affect the ability of the shoals to continue serving as nursery areas for fish. The Army Corps of Engineers DEIS, however, indicates a thorough geophysical analysis was undertaken to evaluate the seafloor and subsurface conditions at the proposed site. Simulations were undertaken by modelers at the Woods Hole Oceanographic Institution. The report did point out that the sandwaves found were indicative of the "dynamic shallow water" of Horseshoe Shoal.<sup>9</sup>

## **Ownership of Bottom**

Permits for any use of the bottom should not confer ownership since it is a common property resource, several fishermen noted. If the project goes forward, some

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<sup>7</sup> Again, see letter and diagrams submitted by William Amuru. One reviewer of this report who is very knowledgeable about fishing gear operation was surprised by this concern. He suggested that the distance is more commonly 250 feet. (Scope ratios are normally 3:1 but can be 5:1 in shallows. In areas 50 feet deep, the trawl warp to the door (the widest part of the system) could reach 250 feet.)

<sup>8</sup> Commercial fishing for sea bass is permitted from January 1 to April 30 for all gear. Depending on how much of the quota has been caught, fishing may be allowed May 1 to June 10. Finally, if 100 percent of the quota has not been caught, fishing is allowed from August 1 to August 23. (That is, no commercial fishing is allowed from June 11-August 1.)

<sup>9</sup> Section 5.1.3, page 9.

participants suggested that the area could be leased for a set time period at a reasonable market rate. (Author's note: bottom leases are common for shellfish propagation.) Some of the funds thus generated, it was suggested, could be set aside for reevaluation of the impacts and possible compensation to the communities or individuals affected.

## **Birds**

Concern was expressed particularly for migrating red knots (sandpipers), eider ducks and roseate terns. The Northeast breeding population of roseate terns has been listed as "endangered" and 50% of the regional breeding population nests on Bird Island, Massachusetts. Eider ducks are the Northeast's largest duck and they move in great flocks to harvest mussels in the area. Fishermen anticipate that mussels will attach to the windmill platforms and thus will attract eider ducks that could then be injured or killed by the turning blades. Red knots are small birds that migrate from the Arctic Circle to South America whose numbers are already far below their historical population. Their tendency to form large concentrations at traditional staging areas during migration makes the population vulnerable.

## **Requests**

Before permitting goes forward, interviewed fishermen urgently requested that in addition to the information provided by this report, that the Commonwealth of Massachusetts consider additional data sets in their analysis, even if this requires additional research. In particular, they requested:

- A review of state records on landings
- Analysis of spawning populations of commercial species and
- A more accurate assessment of existing stocks.

## **Conclusions**

The commercial and recreational harvest of fish and shellfish in Nantucket Sound provides millions of dollars in revenue to the local economy and is a way of life in many local towns. One hundred, twenty-three commercial vessels have been identified by name as fishing in Nantucket Sound. Interviewees estimated that commercial mobile gear fishing vessels earn one-half to 60 percent of their annual income fishing on Horseshoe Shoal, the proposed area of the wind farm.

The interviewees warned that the presence of wind turbines on the shoals would certainly force some existing commercial fishing businesses to move their activities into other areas of the Sound. In addition, these businesses would probably have to target alternative species, possibly including species that are already fully exploited in the Sound. They believe that potential impacts include gear conflicts, overfishing, and economic losses.

Covering 24 square miles, the Cape Wind project seeks to build one of the world's largest offshore wind power plants on Horseshoe Shoal in Nantucket Sound. The plant will

consist of 130 wind turbines connected to a central service platform including a helicopter pad and crew quarters. Each turbine will have about 150 gallons of hydraulic oil and the service platform will have at least 30,000 gallons of dielectric oil and diesel fuel. The plant will be less than 5 miles from land at its closest point. Serious potential environmental impacts identified by participating representatives of the fishing industry included:

- loss of resources due to habitat disruption, pollution
- large-scale habitat conversion of shoal area due to changes in water flow and sediment transport
- increased bird mortality due to strikes and temporary loss of forage<sup>10</sup>
- loss or alteration of critical squid spawning habitat and/or
- loss of fishing access, particularly to mobile gear.

This limited study does not purport to have determined the full scope of the potential impacts of the proposed wind farm on the portion of the fishing industry or fishing communities associated with the use of Horseshoe Shoal. Nor can the authors assert how many individual businesses will be affected, either directly or indirectly. Nevertheless, the authors do caution that a number of mobile gear fishing vessels could be displaced if the proposed Cape Wind farm is constructed, and this displacement could have a broader impact throughout the entire Nantucket Sound area.

As the population of the United States continues to migrate to the coastal zone, conflicting demands for use of both the shoreside and coastal resources will only increase. It is essential that a procedure be put in place to assure that the direct, indirect and cumulative impacts on existing or traditional uses are considered prior to construction of new projects to assure that losses are either not incurred or are mitigated.

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<sup>10</sup> The DEIS noted the potential for temporary displacement of prey and other effects on the avian population, but claims that this would be confined to construction and decommissioning phases. (Section 5.7.3, page 7).

***Appendix 1: Aggregate map of commercial fishing in Nantucket Sound***

***Appendix 2: William Amuru***

### **Appendix 3: Chatham's Tally**

According to a tally by a fishing business in Chatham, fifty-four commercial fishing vessels from Chatham could be affected by the construction of the wind farm in Nantucket Sound. In addition, the same business counted twelve vessels from Harwich, six from Orleans, five each from Nantucket and Marshfield, four each from Gloucester and Brewster, three each from Edgartown (Martha's Vineyard), and Falmouth, two each from Rockport, Barnstable, Yarmouth and Newport, RI and one each from 18 other communities that might be affected. In addition to the crews of the fishing vessels tallied, another 72 individuals, including shellfishermen, and thirteen fishing organizations could be affected. Moreover, there are four fish weir companies that are currently operating in Nantucket Sound with weir grants in the towns of Chatham, Harwich, Dennis, Yarmouth, Hyannis, Centerville, and Osterville.

#### **Number of vessels that fish in Nantucket Sound listed by community**

Total Number of Vessels							
One	Two	Three	Four	Five	Six	Twelve	Fifty-four
Auburn	Rockport	Edgartown	Gloucester	Nantucket	Orleans (including S. Orleans)	Harwich (including S. Harwich, and Harwichport)	Chatham (including W. Chatham, N. Chatham, S. Chatham)
Holden	W. Barnstable	Falmouth	Brewster	Marshfield			
Norwood	W. Yarmouth						
Stoneham	Newport, RI						
Duxbury							
Hanover							
Wareham							
Cotuit							
E. Orleans							
Eastham							
Osterville							
S. Dennis							
Wellfleet							
Assonet							
Mattapoisett							
Raynham							
Rochester							
Rockaway, NY							
Gramby							