

Rhode Island Fishing Value in the Vineyard Wind Construction and Operations Plan Area



RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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The following analysis briefing document created by the Rhode Island Department of Environmental Management, Division of Marine Fisheries (DMF) details an estimate of the ex-vessel value of the Rhode Island (RI) commercial fishing industry that is derived from the Vineyard Wind Construction and Operations Plan (COP) area, along with a projection of that value over 30 years. As with other analyses of this type, given limited and incomplete data over the past 15 years connecting landings to location, it was necessary to make science-based assumptions to derive a total value from this area. The area of the leased site used for this analysis is the area bounded by the turbine locations provided in the COP, released through a BOEM Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) on March 30, 2018 (federal register code 83 FR 13777). The area has been modified since this original layout, but DMF was not able to redo the analysis with this new area. This analysis does not examine any other economic, social, or ecological factors beyond ex-vessel values.

The DMF estimates that the ex-vessel value of fishing in the Vineyard Wind COP area with an assumed 2 nautical mile (nm) buffer along the north and south boundaries is \$35,611,702.85 for a 30-year period (including lease and construction time). This value is premised on existing trips that either fully or partially intersect the COP area, including a 2 nm section north or south of the area (Figure 1), not being taken if the wind farm is constructed in a manner that is not consistent with traditional fishing practices. The 2 nm buffer and loss of the whole trip are assumptions based on feedback from fishermen who prosecute various fisheries in this area.

Recall that the value associated with the 2 nm assumption is \$35,611,702.85 for the 30-year period of the lease including construction (Table 1). A different assumption can be made that only a 1 nm buffer around the COP area would be impacted (Figure 1). In other words, trips that utilize only the waters beyond 1 nm around the COP would not be affected. For a buffer of only 1 nm, the value associated with fishing over the 30-year period is \$30,531,599.84 (Table 2).

The values in this analysis include ex-vessel value of fishing currently occurring in the COP area plus the buffer per the assumptions stated above and below and do not account for future increases in fish populations, increases in value, or inflation. The ex-vessel values therefore should not be considered an analysis of any economic value beyond the ex-vessel value of fishing in the COP area..

The following steps were taken to arrive at a range of \$30,531,599.84 to \$35,611,702.85, depending on the size of the buffer:

- Vessel Monitoring System (VMS) data were connected to Vessel Trip Report (VTR) data by Vessel ID. The VTR data were then linked to dealer reports (landings) by VTR number. The combined dataset was then used to select only data points where the latitude and longitude coordinates in the VMS fell within the target area including the Vineyard Wind COP, with a 2 nm buffer to the north and south of the turbines (or 1 nm, depending on the selected method). The remaining data points were then sorted to include only a single row per trip per species landed in Rhode Island. For each species, within each year, the individual trip values were summed to calculate the value of landings of trips that utilized the COP area. These values were divided by the rate of VMS coverage (number

of permits in the VMS data divided by the number of federal permits in the VTR landing the same species for the same area) to calculate total exposure.

- Assumptions:
 - Those utilizing federal permits and fishing in the COP area are not also fishing in state waters on the trip where they were in the COP.
 - Landings characteristics from vessels covered by VMS are similar to those not covered by VMS.
 - A whole trip would be affected by avoidance of the wind development area as noted in fishermen feedback during public meetings about this area.
 - A distance (2 nm or 1 nm depending on the methodology used) around the wind turbines may also be avoided by commercial fishing vessels based on fishermen feedback during the discussions on transit lanes.
- Given that lobster and Jonah crab fishing have no VMS or VTR data requirements, separate methods were necessary. Catch information (biomass) from tows collected by the Northeast Fisheries Science Center Bottom Trawl Survey were used to understand spatial distribution of American lobster and Jonah crab. Tow information from both the spring and fall surveys were included. Biomass per tow information were spatially interpolated over the northeast U.S. shelf using inverse distance weighting. Interpolations were conducted over a 0.1-degree grid. Using annual depictions of interpolated abundances, the proportion of abundance of Lobster Management Area 2 (LMA2) within the COP was estimated by dividing the total COP abundance by that of the abundance in the entire LMA2. The proportion was then multiplied by the annual poundage of Rhode Island landings from LMA2. Finally, the poundage value was multiplied in each year by the average Rhode Island dockside sales price per pound of lobster, and Jonah crab, respectively for each year.
 - Assumptions:
 - North East Fisheries Science Center (NEFSC) trawls adequately characterize lobster abundances.
 - The NEFSC survey over the shelf provides spatial resolution useful in estimating fine scale changes, such as those in the COP and LMA2.
 - Spring and fall are adequate seasons to estimate these species abundances.
 - The weighting used in the inverse distance weighting is adequate.
 - Abundance is correlated linearly to landings in this area through time.
- Finally, since the wind farm lease will span over multiple years, and a non-east-west configuration will likely preclude all commercial fishing from this area during that period per feedback we have received from the fishing community, projections were made of the total exposure for 30 years (25 years for the lease duration and an additional 5 years for construction and decommissioning). To be able to adequately project this information, the proportion of species-specific seafood ex-vessel value coming from the COP area relative to the overall value of these same species to RI was calculated for years in which the COP specific value could be calculated. An average proportion for these years was then acquired. Species were grouped based on relevant management groupings. The

overall value for these species to RI was prorated based on this proportion. The reason for this is the number of years of direct value from the COP area is limited by VMS coverage, therefore to get an adequate time period to analyze, this proportionalization was employed. Once the RI species-specific value was prorated, an Auto-Regressive Integrated Moving Average (ARIMA) model was used on the timeseries (spanning from 2004 – 2017) to model the trends in value and project those trends forward for the projection period based on the ARIMA model parameters. ARIMA models are a class of models that capture a suite of different standard temporal structures in time series data. For this analysis, the resulting trends were largely flat given the variance in the data and the length of the time series.

- Assumptions:

- The annual proportion of total Rhode Island species-specific value coming from the COP area scales directly to the overall species-specific value in a consistent manner.
- Factors controlling effects on value, while different in any given year, will result in similar value trends over the projection period.
- Effects of regulations are ignored as these could move in either a negative or positive direction and are not readily predictable.
- Effects of climate change are not explicitly modeled, though may be picked up by the ARIMA model.

Using available data from the Standard Atlantic Fisheries Information System (SAFIS), VTR, VMS, scientific surveys, and the assumptions outlined above, and depending on the size of the requisite buffer bordering the COP, the estimated range of ex-vessel landing values associated with that portion of the total area leased by Vineyard Wind (depicted in Figure 1) range from \$30,531,599.84 to \$35,611,702.85 over 30 years. It is important to re-emphasize that the values presented do not include any shoreside impacts (including crew, fuel, gear, ice, processing, or packaging costs). There are entire businesses that provide these services that may also be affected, and many of these services occur in the major RI ports, which will also see impacts from the offshore wind energy area if fishing is precluded from occurring in this area. Additionally, the value of seafood served at local restaurants has not been accounted for; restaurants may also be affected by changes in seafood availability. Additionally, ecological impacts to marine resources and impacts that habitat alteration in this area may impose upon the productivity of various marine populations are not considered, which could also affect landings from the area as well as surrounding regions through time.

Table 1 – Projected ex-vessel landing values for COP with 2 nm buffered total trip analysis

Species	30-Year Value
BLUEFISH	\$116,408.13
CRAB, JONAH	\$137,324.71
DOGFISH, SMOOTH	\$28,921.06
DORY, AMERICAN JOHN	\$12,191.76
SUMMER FLOUNDER - SCUP - BLACK SEA BASS	\$4,585,714.62
GOOSEFISH	\$435,638.44
GROUND FISH	\$2,160,474.76
LOBSTER, AMERICAN	\$1,413,517.02
SCALLOP, SEA	\$1,060,092.09
SKATES	\$25,318.54
NE SMALLMESH SPECIES (HAKES)	\$4,664,599.43
SQUID - MACKEREL - BUTTERFISH	\$20,968,100.76
OTHER*	\$3,401.53
Total	\$35,611,702.85

* The other category includes Atlantic bonito, spiny dogfish, conger eel, and sea robins.

Table 2 – Projected ex-vessel landing values for COP with 1 nm buffered total trip analysis

Species	30-Year Value
BLUEFISH	\$90,151.13
CRAB, JONAH	\$137,324.71
DOGFISH, SMOOTH	\$28,921.06
DORY, AMERICAN JOHN	\$9,250.86
SUMMER FLOUNDER - SCUP - BLACK SEA BASS	\$4,071,710.54
GOOSEFISH	\$388,476.48
GROUND FISH	\$2,144,209.51
LOBSTER, AMERICAN	\$1,465,889.13
SCALLOP, SEA	\$1,059,381.71
SKATES	\$25,129.43
NE SMALLMESH SPECIES (HAKES)	\$4,401,443.07
SQUID - MACKEREL - BUTTERFISH	\$16,706,909.04
OTHER*	\$2,803.18
Total	\$30,531,599.84

* The other category includes Atlantic bonito, spiny dogfish, conger eel, and sea robins.

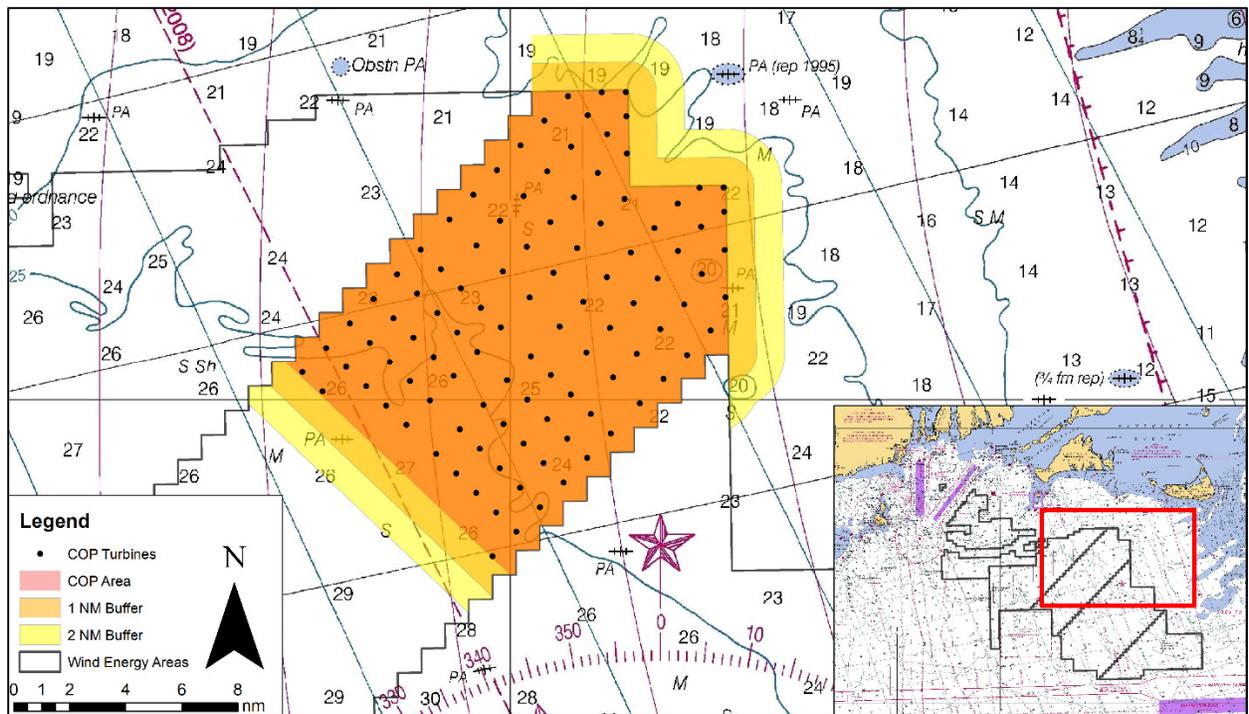


Figure 1 - The Vineyard Wind COP area (as published on 3/30/2018) with 1 nm and 2 nm buffers.