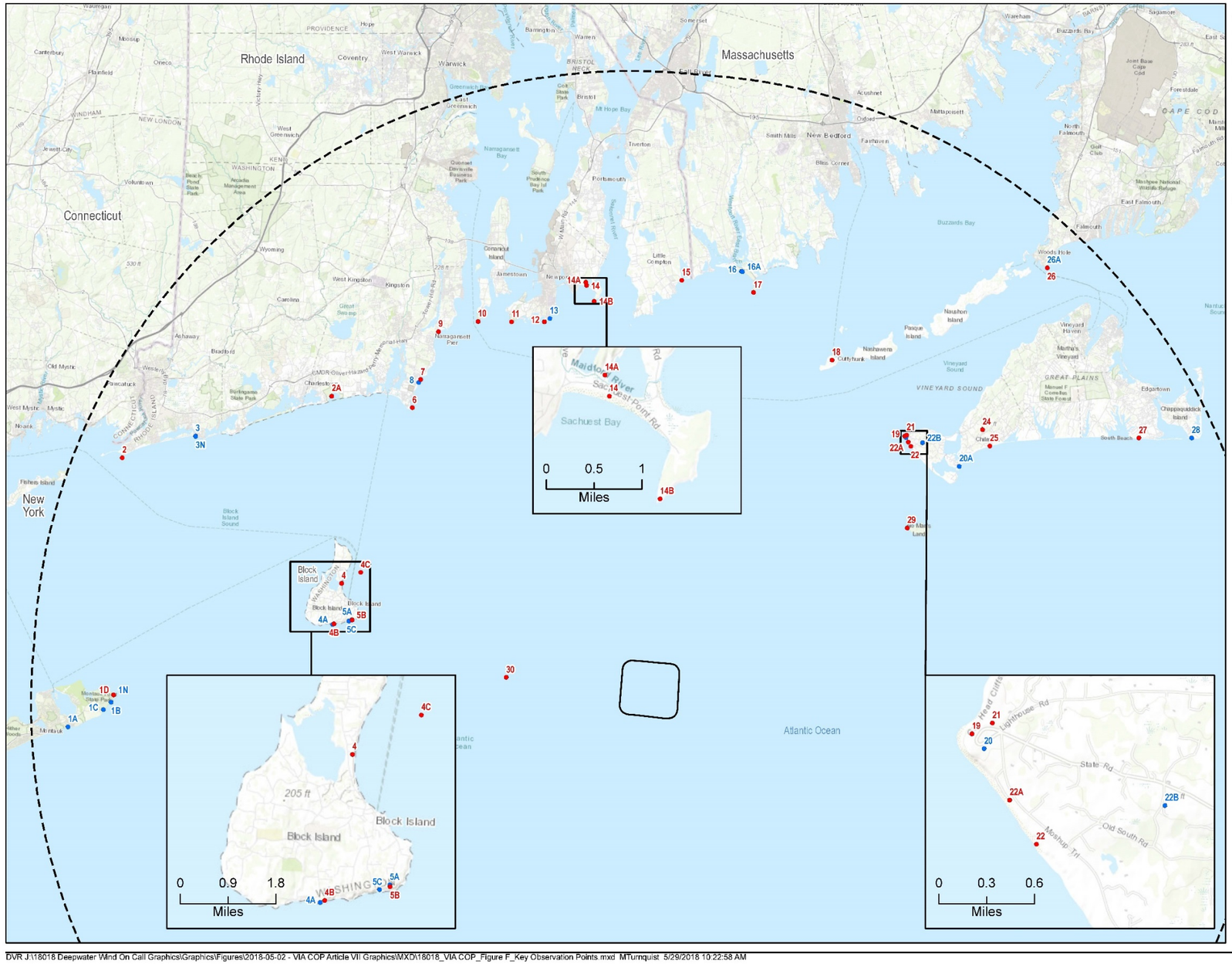



Locator Map


**Legend**

- Simulated Key Observation Point
- Candidate Key Observation Point
- Project Area
- 40-Mile Visual Study Area

**Sources:**
ESRI ArcGIS Online "World Topographic Map" map service.

N

0 7 14
Miles

0 15 30
Kilometers

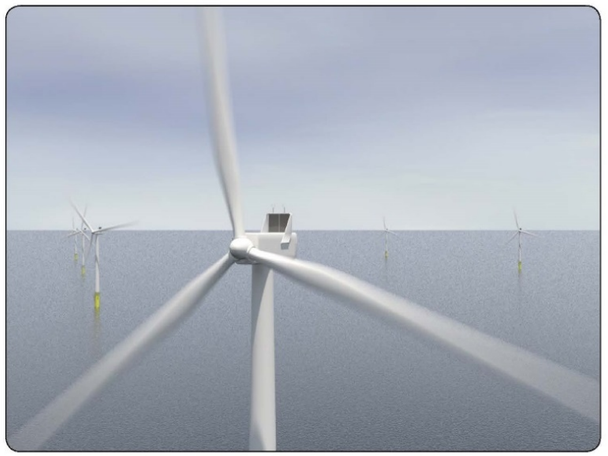
SOUTH FORK WIND FARM

**Key Observation Points**
Deepwater Wind
New York/Rhode Island, US

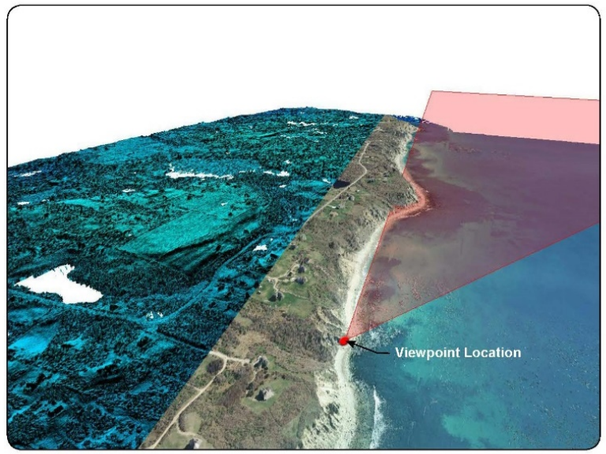
DVR J:\18018 Deepwater Wind On Call Graphics\Graphics\Figures\2018-05-02 - VIA COP Article VII Graphics\MXD\18018_VIA COP_Figure F_Key Observation Points.mxd MTurnquist 5/29/2018 10:22:58 AM

**Figure 4.5-6. Key Observation Points**

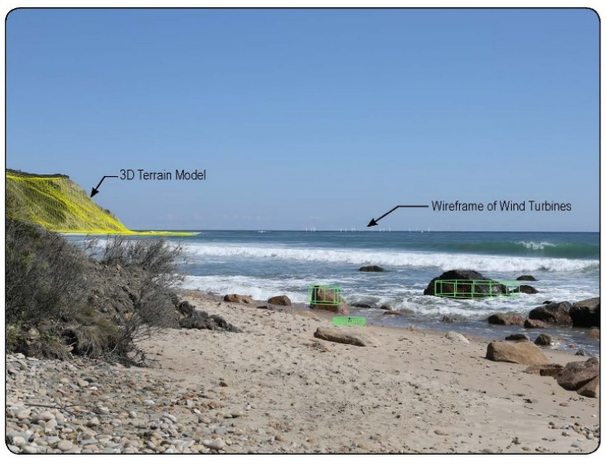
**1.** Photos are selected to illustrate typical views of the proposed project that will be available to representative viewer/user groups from the major landscape similarity zones and sensitive sites within the visual study area.



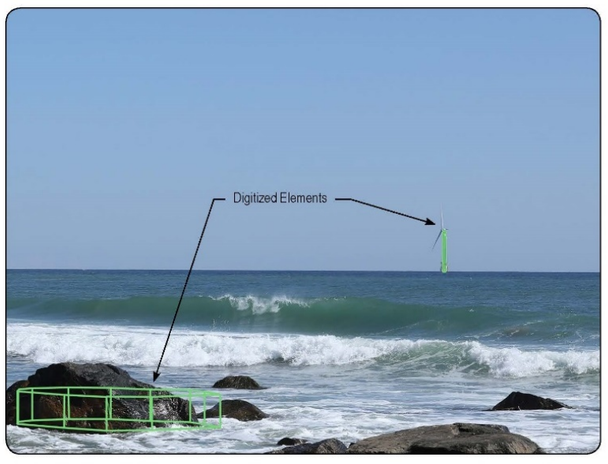
**2.** A three-dimensional computer model of the project is built based on proposed turbine specifications and coordinates.




**3.** Aerial photographs, LIDAR data, and GPS data collected in the vicinity of the viewpoints are used to align the photo with the 3D model illustrated in Image 2.




**4.** These data are superimposed over photographs from each of the viewpoints, and minor camera changes are made to align all known reference points within the view.




**5.** Digitized landscape features (buildings, structures, etc) from photographs and aerials of the location help increase the accuracy of the camera target position.

**6.** The proposed exterior color/finish of the turbines and other project components were then added to the model and the appropriate sun angle is simulated based on the specific date, time and location (latitude and longitude) from which each photo was taken.

**Simulation Methodology**
Deepwater Wind
New York/Rhode Island, US
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SOUTH FORK WIND FARM

**Figure 4.5-7. Key Observation Points**

**Lighting**

The proposed SFWF WTGs will be equipped with both aviation obstruction warning lights on top of each nacelle and USCG navigation warning lights on the platform near the tower base. To evaluate the potential visibility and visual impact of these new lights, the VIA included a viewshed analysis based on the anticipated height and locations of the aviation warning lights, as well as nighttime visual simulations from selected KOPs where the aviation warning lights were anticipated to be visible.

The nighttime viewshed analysis was conducted in the same manner as the daytime analysis, but was based on a height of 475.7 feet (145 m), where the aviation warning lights would be mounted on the nacelles. The nighttime viewshed analysis suggests that aviation lighting will be visible from approximately 1.1 percent of the land area in the 40-mile (64.4-km) SFWF visual study area (Table 4.5-4). This reduction in visibility can be attributed to the lower height of the aviation warning lights (relative to the turbine blade tips), combined with the screening effects of curvature of the earth. Areas in which the aviation warning lights are screened by curvature of the earth include Montauk Point and Ditch Plains Beach on Long Island, the south-central and southeastern beaches on Martha's Vineyard, and all the shoreline in the Town of Westerly, Rhode Island, on the mainland. In each of these areas, the blade tip analysis indicated potential visibility, but the nighttime viewshed indicated lack of visibility.

**Table 4.5-4. Aviation Warning Light Viewshed Results Summary.**

| Distance from Project Site | 40-Mile Radius Study Area | | |
|---|---|---|---|
| | Total Land Area (square miles) (square kilometers) | Land Area with Potential Visibility/ZVI[a] (square miles) (square kilometers) | Percent |
| 0 to 10 Miles[b] | 0 | 0 | 0.0% |
| 10 to 20 Miles[c] | 3.8 (9.8) | 0.4 (1.0) | 10.6% |
| 20 to 30 Miles | 174.9 (452.9) | 6.6 (17.1) | 3.8% |
| 30 to 40 Miles | 557.0 (1,442.6) | 0.9 (2.3) | 0.2% |
| **Total 40 Mile Landward Study Area [a]** | 735.6 (1,905.2) | 8.0 (20.7) | 1.1% |

[a]Land area and percent totals may not add up to 100% or equal study area acreage reported elsewhere in this report due to rounding and/or raster-to-vector conversion.
[b]There is no significant land area within 10 miles of the Project Site.
[c]Block Island, RI and Nomans Land Island are the only significant land masses within 20 miles of the Project site.

Nighttime visual simulations were prepared for five of the selected KOPs, as indicated in Table 4.5-5.

**Table 4.5-5. Viewpoints Selected for Nighttime Visual Simulations.**

| Viewpoint Number | Viewpoint Name | Viewing Distance (miles) (km) |
|---|---|---|
| 1N | Montauk Lighthouse, New York | 35.0 (56.3) |
| 5N | Southeast Lighthouse, Rhode Island | 19.2 (30.9) |
| 6N | Point Judith Lighthouse, Rhode Island | 22.9 (36.9) |
| 11N | Brenton Point State Park, Rhode Island | 24.6 (39.6) |
| 19N | Aquinnah Overlook, Massachusetts | 22.2 (35.7) |

To prepare nighttime simulations, data on the proposed aviation obstruction warning lights were collected from the FAA Advisory Circular 70/7460-1L, which provides guidelines for the lighting of WTGs (FAA, 2016). In addition, views of the operational BIWF were documented to determine the appearance of the aviation warning lights at night at distances beyond 20 miles (32.2 km). Computer modeling and camera alignment for the nighttime photos were prepared in the same manner described for the daytime simulations. It was assumed that all lights will flash in a synchronized manner, as currently recommended by FAA guidelines[5]. Nighttime simulations therefore show all WTGs with their lights on. Due to the effects of the curvature of the earth and refraction, USCG warning lights on the WTGs were only considered in views that had a direct line of sight to the foundation transition, which is approximately where the USCG lights will be located.

As with daytime viewpoints, the rating panel's evaluation of nighttime visual impacts was variable depending on other sources of lighting present in the view, the extent of screening provided by buildings/structures and trees, and nighttime viewer activity/sensitivity. Although the composite scores for these simulations did not exceed the threshold of acceptable visual impact for any of the affected LSZs within the SFWF visual study area, they were substantially higher than the daytime scores. While night lighting could potentially have an effect on residents and vacationers in settings where they currently experience dark nighttime skies, in many places, nighttime visibility/visual impact will be limited due to: (1) the abundance of trees that screen all or portions of the Project from the majority of homes within the study area, (2) the existing shoreline and offshore light sources that already impact nighttime ocean views, (3) the distance of the Project from mainland viewpoints, and (4) the concentration of residences in villages, town centers, and neighborhoods, or along highways, where existing lights already compromise dark skies and compete for viewer attention. Therefore, lighting will have a ***minor impact***.

### South Fork Export Cable - Onshore

The SFEC onshore export cable has been sited and designed to minimize potential visual impacts. The cable will be installed underground, beneath existing roads or within other existing ROWs, from the landing site to the new Interconnection Facility adjacent the existing East Hampton substation. Minimal tree clearing will be required along the route of the terrestrial export cable, and therefore will not result in any permanent visual impacts. The SFEC -

[5] The project is being proposed greater than 12 miles (19.3 km) offshore (the FAA jurisdictional limit). However, it is assumed that BOEM will adopt similar requirements.

Interconnection Facility is the only proposed above-ground facility that will be built as part of the SFEC.

### *Construction*

**Traffic**

Installation of the SFEC and construction of the new interconnection facility on Long Island will result in short-term, ***minor impacts*** to the visual environment resulting from the presence of construction equipment and workspace signage on local roads and in the local landscape. Construction activity at the proposed substation site could also result in some visible disturbance, such as tree clearing, earth moving, and vehicle activity. Although traffic and other construction activity could temporarily alter the visual character of the landscape, these impacts will be ***short-term*** and ***localized***.

**Visible Structures**

Viewshed analysis was used to evaluate the potential visibility of the interconnection facility. A DSM of the onshore visual study area, created from lidar data, indicates that the interconnection facility could potentially be visible from 1.8 percent of the 3-mile (4.8-km) SFEC visual study area (see Figure 4.5-3 and Appendix U, Figure 8 of the VRA).

Field review indicated that the actual visibility of the interconnection facility is likely to be extremely limited due to densely situated buildings and houses in the villages, and dense, mature evergreen and deciduous forest in the surrounding areas. Potential visibility will generally be limited to a few areas within approximately 0.25 mile (0.4 km) of the interconnection facility. However, even in these nearby areas, the existing East Hampton substation, as well as the SFEC – Interconnection Facility, is screened from view by dense, mature vegetation that ranges in height from approximately 50 to 70 feet (15 to 21 m).

In the limited areas of potential visibility, it is expected that views of the interconnection facility will be restricted to the uppermost portions of the lightning masts (the tallest structures in the proposed station). In areas further removed, the lightning masts, even if visible, will be difficult to distinguish because of their narrow profile, gray color, and/or screening provided by intervening tree branches.

Field review of the interconnection facility confirmed that the station components will not be visible from, or have an adverse visual effect on, the aesthetic resources of statewide significance within the SFEC visual study area.

Visual simulations and line-of-sight profiles were prepared to illustrate the limited visual effect of the proposed substation on nearby visual receptors. These simulations illustrate that existing vegetation screens views of the SFEC - Interconnection Facility from nearby vantage points located in public ROWs. The only visible components of the proposed substation from these areas would be limited to the uppermost portions of the proposed lightning masts and a thinning of existing vegetation. Foreground vegetation that screens visibility of the substation from public vantage points would not be removed. From more distant vantage points, the SFEC interconnection facility would be even less visible and have even less of an effect on the visual environment. As a result, construction and operations of the proposed SFEC – Interconnection Facility is not anticipated to result in significant changes to the existing visual character or scenic quality of the SFEC visual study area, and will therefore have a ***minor impact***.

**Lighting**
Lighting at the SFEC - Interconnection Facility will be kept to the minimum necessary to ensure safety and security. It is anticipated that all lights at the station will be turned on only as needed, by manual switch or motion detector. As a result, lighting will have ***minor*** to ***no impact***.

## 4.5.3 Environmental Protection Measures

**South Fork Wind Farm**

In accordance with the USACE VRAP methodology, because the threshold of acceptable visual impact was not exceeded for any identified LSZ within the SFWF visual study area, no mitigation is required to reduce or offset the visual impact of the SFWF.

Several measures that will reduce visual impact have already been incorporated into the design of the SFWF. These include:

- The location of WTGs, approximately 18.9 miles (30.4 km) from Block Island, 22.0 miles (35.4 km) from Martha's Vineyard, and 34.9 miles (56.2 km) from Montauk, restricts available views from visually sensitive public resources and population centers to the "seldom seen" distance zone.
- WTGs will have uniform design, speed, height, and rotor diameter.
- The color of the SFWF WTGs (less than 5 percent grey tone) generally blends well with the sky at the horizon and eliminates the need for daytime lights or red paint marking of the blade tips.
- Use of Aircraft Detection Lighting Systems (ADLS) will mitigate nighttime visual impacts if the technology is commercially available and approved by BOEM.

Although the threshold of acceptable visual impact was not exceeded, based on rating panel evaluation of nighttime simulations, aviation (and in some cases USCG) warning lights on the WTGs will increase the potential for visual impact. Such lighting is a required safety measure and cannot be eliminated. However, lighting-related impacts can be minimized by employing light mitigation technologies, such as ADLS. ADLS technology allows for the obstruction lighting to be active only as necessary when aircraft are approaching and within the airspace of the wind farm, versus employing continuous flashing lights at nighttime. Radar and radio technologies are used to control the activation and deactivation of the warning lights, based on the detection of aircraft. By applying ADLS, night lighting impacts to onshore communities can be substantially reduced or limited. DWSF will use ADLS to mitigate nighttime visual impacts if the technology is commercially available and approved by BOEM.

While it is possible to control the activation of the aviation warning lights through ADLS, the navigation warning lights mandated by the USCG are required to be continuously active, as they are considered mapped aids to navigation. Beyond 19 miles (30.6 km), the turbine platforms where the USCG lights would be mounted will be fully screened by curvature of the earth from sea level vantage points. Beyond 35 miles (56.3 km), the turbine platform and its associated lights would no longer be visible from elevated (50 feet [15.2 m] above mean sea level) locations onshore. Due to the minimal visibility of the marine navigation lights from shore, no mitigation is considered necessary to reduce the visibility of these lights to onshore communities.

**South Fork Export Cable Onshore**

Visual impact has been avoided and minimized by burying the onshore cable and through careful site selection and design for the interconnection facility. The SFEC – Interconnection Facility will not be visible from, nor will it have a negligible visual effect on, aesthetic resources of statewide or local significance within the SFEC visual study area.

In addition, several measures that will reduce or mitigate visual impact have already been incorporated into the design of the SFEC – Interconnection Facility. These include:

- The SFEC - Interconnection Facility will be located adjacent to an existing substation on a parcel zoned for commercial and industrial use.
- At the SFEC - Interconnection Facility, additional screening will be considered to further reduce potential visibility and noise.

# 4.6 Socioeconomic Resources

The overall socioeconomic region of influence (ROI) includes the states, counties, and communities in that may be impacted by potential Project activities. The overall ROI is the same for both the SFWF and SFEC, and, as summarized in Table 4.6-1, includes the states of New York, Rhode Island, and Massachusetts; four counties; and the seven communities where Project construction, O&M, or decommissioning activities will occur. The potential for conflicts with nearshore (e.g., beach recreation, wildlife viewing) and offshore activities (e.g., sailing and other recreational boating, recreational fishing, charter boat fishing, or commercial fishing) were also considered in the selection of the communities in the ROI. Table 4.6.-1 also highlights those specific communities considered within the ROI for potential impacts on Housing and Property Values, as well as Recreation and Tourism and based on their location within the potential viewshed of the SFWF (see Section 4.6.3, Housing and Property Values, Section 4.6.4, Recreation and Tourism, Section 4.5, Visual Resources, Appendix U, Visual Resources Assessment Report for Substation, and Appendix V, Visual Impact Assessment Report for the SFWF).

**Table 4.6-1. Socioeconomic Region of Influence Communities**

| ROIs | | State | County | Communities or Shoreline | Potential Project Components, Supporting Activities, or Impacts |
|---|---|---|---|---|---|
| Overall Socioeconomic | Property Value / Tourism | | | | |
| • | • | New York | Suffolk | Montauk Census-designated place (CDP) | • SFEC – Onshore<br>• SFWF O&M Facility potential location |
| • | • | New York | Suffolk | East Hampton North CDP | • SFEC – NYS sea-to-shore transition<br>• SFEC – Onshore |

**Table 4.6-1. Socioeconomic Region of Influence Communities**

| ROIs | | State | County | Communities or Shoreline | Potential Project Components, Supporting Activities, or Impacts |
|---|---|---|---|---|---|
| Overall Socioeconomic | Property Value / Tourism | | | | |
| ● | ● | New York | Suffolk | Town of East Hampton | • SFEC – Onshore<br>• SFEC - Interconnection Facility |
| ● | | New York | Suffolk | Wainscott CDP | • SFEC – Onshore |
| | ● | New York | Suffolk | Eastern and southeastern shoreline | • Within potential viewshed of the SFWF<br>• Potential for impacts to property values and tourism |
| ● | | New York | Kings | Brooklyn | • Potential port for assembly, staging, and logistics |
| ● | | New York | Richmond | Staten Island | • Potential port for assembly, staging, and logistic |
| | | New York | Albany | Albany | • Potential port for assembly, staging, and logistics |
| ● | | Rhode Island | Washington | Town of North Kingstown | • Potential port for assembly, staging, and logistics<br>• SFWF O&M Facility potential location |
| | ● | Rhode Island | Washington | Southern shoreline of coast and Block Island | • Within potential viewshed of the SFWF<br>• Potential for impacts to property values and tourism |
| ● | | Rhode Island | Providence | City of Providence | • Potential port for assembly, staging and logistics |

**Table 4.6-1. Socioeconomic Region of Influence Communities**

| ROIs | | State | County | Communities or Shoreline | Potential Project Components, Supporting Activities, or Impacts |
|---|---|---|---|---|---|
| Overall Socioeconomic | Property Value / Tourism | | | | |
| | • | Rhode Island | Newport | Southern shoreline | • Within potential viewshed of the SFWF<br>• Potential for impacts to property values and tourism |
| • | | Massachusetts | Bristol | City of New Bedford | • Potential port for assembly, staging and logistics |
| | • | Massachusetts | Bristol | Southern shoreline | • Within potential viewshed of the SFWF<br>• Potential for impacts to property values and tourism |
| | • | Massachusetts | Dukes | Southern and western shoreline | • Within potential viewshed of the SFWF<br>• Potential for impacts to property values and tourism |

In addition to the locations identified, there may be several others with ports to be used by the Project. These potential port locations are Albany, Brooklyn, and Staten Island, New York; and New London, Connecticut. At this point in the Project planning process, it is expected these facilities will be used in their current condition during the relatively short-term of construction (or decommissioning). Currently, no permanent, operational Project facilities will be located at these port areas. Therefore, it is highly unlikely that the Project will have measurable impacts on these areas, and these areas are not presently included in the ROI, and therefore not described in the following impact evaluations.

## 4.6.1 Population, Economy, and Employment

### 4.6.1.1 Affected Environment

The affected environment for population, economy, and employment are the same for the SFWF and SFEC and are presented together in Section 4.6.1.1; impacts are described separately in Section 4.6.1.2.

## South Fork Wind Farm and South Fork Export Cable

### *Population*

This subsection describes the population characteristics and trends in the socioeconomic ROI to provide a basis for evaluating potential impacts from Project-related changes. Table 4.6-2 summarizes the area of each geography in square miles; its population in 2000, 2010, and 2015; and the estimated overall population change between 2000 and 2015 (USCB, 2000, 2010a, 2010b, 2015a).

Among the four counties, Suffolk County, New York, had the largest population (greater than the state of Rhode Island). In 2015, Suffolk County had 1.5 million residents and a population density of 1,646 people per square mile. However, the four communities noted in Table 4.6-2 are located further away from the New York City metropolitan area and tend to be smaller and less dense. In 2015, these four communities had a combined population of 30,282 residents, or approximately 2 percent of Suffolk County's total population.

The city of Providence, Rhode Island, with a population of 178,680 people and 9,707 residents per square mile in 2015, was by far the densest community in the study area. The city of New Bedford, Massachusetts, was also densely populated. It had 4,761 people per square mile in 2015.

**Table 4.6-2. SFWF and SFEC Population Characteristics**

| Entity | Land Area (square miles) | USCB 2000 | USCB 2010 | Population Estimate ACS 2015 | 2015 Population Density (persons per square mile) | USCB 2000 - 2015 Change | Median Age ACS 2015 |
|---|---|---|---|---|---|---|---|
| ***New York*** | ***47,126*** | ***18,976,457*** | ***19,378,102*** | ***19,673,174*** | ***417*** | ***4%*** | ***38*** |
| *Suffolk County* | *912* | *1,419,369* | *1,493,350* | *1,501,373* | *1,646* | *6%* | *41* |
| Town of East Hampton | 74 | 19,719 | 21,457 | 21,844 | 294 | 11% | 51 |
| East Hampton North CDP | 6 | 3,587 | 4,142 | 3,979 | 713 | 11% | 44 |
| Montauk CDP | 18 | 3,851 | 3,326 | 3,495 | 199 | -9% | 54 |
| Wainscott CDP | 7 | 628 | 650 | 753 | 112 | 20% | 45 |
| ***Rhode Island*** | ***1,034*** | ***1,048,319*** | ***1,052,567*** | ***1,053,661*** | ***1,019*** | ***1%*** | ***40*** |
| *Washington County* | *329* | *123,546* | *126,979* | *126,405* | *384* | *2%* | *43* |
| Town of North Kingstown | 43 | 26,326 | 26,486 | 26,310 | 610 | 0% | 43 |
| *Providence County* | *410* | *621,602* | *626,667* | *630,459* | *1,540* | *1%* | *37* |

**Table 4.6-2. SFWF and SFEC Population Characteristics**

| Entity | Land Area (square miles) | USCB 2000 | USCB 2010 | Population Estimate ACS 2015 | 2015 Population Density (persons per square mile) | USCB 2000 - 2015 Change | Median Age ACS 2015 |
|---|---|---|---|---|---|---|---|
| City of Providence | 18 | 173,618 | 178,042 | 178,680 | 9,707 | 3% | 29 |
| ***Massachusetts*** | ***7,801*** | ***6,349,097*** | ***6,547,629*** | ***6,705,586*** | ***860*** | ***6%*** | ***39*** |
| *Bristol County* | *553* | *534,678* | *548,285* | *552,763* | *999* | *3%* | *41* |
| City of New Bedford | 20 | 93,768 | 95,072 | 94,909 | 4,761 | 1% | 37 |

Sources: USCB, 2000, 2010a, 2010b, 2015a

ACS = American Community Survey

USCB = U.S. Census Bureau

From a trend perspective, the percent change between USCB decennial census taken in 2000 and the USCB 2015 ACS estimate is provided in Table 4.6-2. At the state and county level, population change has been modest since 2000, with growth ranging from a low of 1 percent in Rhode Island and 4 percent in New York to 6 percent in Massachusetts. Among the counties, Suffolk County experienced the highest percent change in population (6 percent), followed by Bristol County with 3 percent growth. The changes in population were more dramatic at the community level. Within Suffolk County, New York, population change varied from a decline of 9 percent in Montauk to increases of 11 percent each in the town of East Hampton and the East Hampton CDP, and 20 percent in Wainscot CDP. Each of these Long Island communities is relatively unpopulated such that small changes in the number of residents result in large percentage changes, especially for Wainscott CDP, a with population of 753 people.

The median age in the study area ranged from a high of 54 in the Montauk CDP in Suffolk County, New York, to a low of 29 in the city of Providence. Overall, the communities on the eastern end of Suffolk County tend to be noticeably older, with a median age of 54 in Montauk and 51 in the town of East Hampton (USCB, 2015a).

### *Economy*

This section characterizes the overall economy of the socioeconomic ROI, by describing the gross domestic product (GDP) of each state, its contribution to the overall national GDP, and the distribution of the civilian workforce by major industry sector. In addition to state information, data are presented for the subset of coastal communities from the ROI that BOEM identified as potentially vulnerable to the impacts of offshore wind development in the RI-MA WEA (ICF, 2012).

#### General Economy

The GDP represents the market value of goods and services produced by the labor and property located within a geography and is influenced to a large degree by size (geographic area).

However, it serves a relative indicator of the size of the economies within the region, particularly when viewed as a percentage of the overall national economy. Table 4.6-3 summarizes the GDP for Massachusetts, New York, and Rhode Island for the first quarter of 2016 and 2017 (BEA, 2017). The GDP of New York was $1.5 billion in the first quarter of 2017, representing approximately 8 percent of the national GDP. The GDP of Massachusetts was $520 million at the beginning of 2017, or 2.7 of the national GDP, while Rhode Island had a GDP of $59 million, representing 0.3 percent of the national GDP (BEA, 2017).

**Table 4.6-3. Current-Dollar Gross Domestic Product by State for the First Quarters of 2016 and 2017**

| | GDP (in Millions of Dollars Seasonally Adjusted at Annual Rates) | | 2016 – 2017 % Change | Percent of the U.S. | |
|---|---|---|---|---|---|
| | 2016 | 2017 | | 2016 | 2017 |
| United States | 18,170,091 | 18,911,981 | 4% | | |
| Massachusetts | 500,418 | 519,970 | 4% | 2.8 | 2.7 |
| Rhode Island | 56,087 | 58,884 | 5% | 0.3 | 0.3 |
| New York | 1,481,479 | 1,500,994 | 1% | 8.2 | 7.9 |

Source: BEA, 2017

Table 4.6-4 demonstrates that despite their broad geographic distribution, the economies of the counties in the overall ROI are very similar. Based on the 2011 to 2015 ACS, over a quarter (26 to 28 percent) of the civilian population is employed in the "educational services, and health care and social assistance" industry sector (USCB, 2015b). Retail trades also are an important industry representing 11 to 14 percent of employment. Meanwhile, careers in "professional, scientific, and management, and administrative and waste management services" represent 9 to 13 percent of employment. Providence County, Rhode Island, and Bristol County, Massachusetts, tended to have slightly more manufacturing jobs, 12 percent, as compared to 7 to 9 percent for the other states and communities in the region. The agriculture, forestry, fishing and hunting, and mining industrial sector employed less than 1 percent of the civilian workforce in the region. The town of East Hampton's Hamlet Business District Plan (2017), which is based upon 2014 employment data to capture self-employed workers, notes a modestly higher percentage 4 percent of its workforce in this sector (Town of East Hampton, 2017).

**Table 4.6-4. Distribution of Civilian Employed Population (16 Years and Over) by Industry**

| Subject | NY | Suffolk County, NY | RI | Providence County, RI | Washington County, RI | MA | Bristol County, MA |
|---|---|---|---|---|---|---|---|
| Educational services, and health care and social assistance | 28% | 27% | 27% | 28% | 28% | 28% | 26% |
| Retail trade | 11% | 12% | 12% | 13% | 11% | 11% | 14% |
| Professional, scientific, and management, and | 11% | 11% | 10% | 10% | 10% | 13% | 9% |

**Table 4.6-4. Distribution of Civilian Employed Population (16 Years and Over) by Industry**

| Subject | NY | Suffolk County, NY | RI | Providence County, RI | Washington County, RI | MA | Bristol County, MA |
|---|---|---|---|---|---|---|---|
| administrative and waste management services | | | | | | | |
| Arts, entertainment, and recreation, and accommodation and food services | 10% | 7% | 11% | 10% | 13% | 9% | 9% |
| Manufacturing | 7% | 8% | 11% | 12% | 9% | 9% | 12% |
| Construction | 6% | 8% | 5% | 5% | 6% | 5% | 7% |
| Finance and insurance, and real estate and rental and leasing | 8% | 7% | 7% | 6% | 7% | 8% | 6% |
| Other services, except public administration | 5% | 4% | 5% | 5% | 4% | 4% | 4% |
| Public administration | 5% | 5% | 4% | 4% | 5% | 4% | 4% |
| Transportation and warehousing, and utilities | 5% | 5% | 4% | 4% | 3% | 4% | 4% |
| Wholesale trade | 3% | 3% | 3% | 3% | 2% | 2% | 4% |
| Information | 3% | 3% | 2% | 2% | 1% | 2% | 2% |
| Agriculture, forestry, fishing and hunting, and mining | 1% | 0% | 0% | 0% | 1% | 0% | 1% |

USCB, 2015b

**Recreation and Tourism Economy**

BOEM's *Atlantic Region Wind Energy Development: Recreation and Tourism Economic Baseline Development: Impacts of Offshore Wind on Tourism and Recreation Economies* identified the coastal areas (that is, counties) within each WEA by their potential to encounter both beneficial and detrimental socioeconomic impacts from each phase (planning, construction, and deconstruction) of wind facility development (ICF, 2012). Factors included:

- Ocean recreation and tourism account for a large percentage of the location's tourism economy.
- Ocean recreation and tourism account for a large percentage of the location's marine economy.
- Tourism accounts for a large percentage of the location's economy.

- The location has many establishments related to coastal and water recreation.
- The location has a high percentage of natural or historic and cultural areas.
- The location has significant development along the coast (ICF, 2012).

Of the 113 geographic areas assessed by BOEM along the Atlantic seaboard, 20 are in Massachusetts, New York, or Rhode Island, and 7 are part of the ROI for the SFWF and SFEC (Table 4.6-5). The assessment also identified Block Island as a "hotspot," meaning it has unique economic, social, or physical characteristics that distinguishes it from Washington County, Rhode Island, overall (ICF, 2012). It also tabulated the recreation and tourism industry employment for these coastal communities. Because the Bureau of Economic Analysis (BEA) does not have a single North American Industry Classification System (NAICS) code for the tourism industry, it compiled those coastal industries that play a significant role in providing services that cater to tourists. Table 4.6-5 summarizes the share of the ocean jobs connected to tourism to indicate the significance of tourism to each corresponding geography. Within the SFWF and SFEC region, this ranged from a low of 40 percent (Bristol County, Massachusetts) to a high of 96 to 97 percent in Providence County, Rhode Island, and Dukes County, Massachusetts. There were 4,115 tourism-related establishments in Suffolk County, New York in 2010 (ICF, 2012).

**Table 4.6-5. Summary of Ocean-related Tourism Indicators[a]**

| State and Communities | Ocean Jobs Related to Tourism, 2010 | Tourism-related Establishments, 2010 | Ocean-related Establishments / Employment, 2009 | Tourism Expenditures, 2010 (in millions) |
|---|---|---|---|---|
| ***RHODE ISLAND*** | | | | |
| Newport County | 75% | 447 | 462 / 7,616 | $790 |
| Providence County | 96% | 1,733 | 496 / 7,175 | N/A |
| Washington County | 62% | 574 | 469 / 7,500 | $751 |
| Block Island, Washington County | N/A | 58 | N/A | $259 |
| ***NEW YORK*** | | | | |
| Suffolk County | 82% | 4,115 | 2,021 / 23,825 | N/A |
| ***MASSACHUSETTS*** | | | | |
| Bristol County | 40% | 1,436 | 512 / 6,471 | $384 |
| Dukes County | 97% | 179 | 165 / 1,398 | $112 |

Source: ICF, 2012
[a] Portions of the counties summarized in this table are within the 40-mile (64.4-km) viewshed of the SFWF.
N/A = not available

### *Employment*

The employment characteristics of the SFWF and SFEC region are summarized in Table 4.6-6 to provide a basis for evaluating potential impacts from Project-related changes. Among the four counties, Suffolk County, New York, has the largest labor force with 778,550 workers (in 2017). Meanwhile, Washington County, Rhode Island, had the smallest labor force with 68,279 (Rhode Island Department of Labor and Training, 2017). The unemployment rate was low throughout the region with each county only being modestly higher or lower than their respective state. Per capita personal income in 2015 was lowest in Providence County, Rhode Island, at $44,399, while Suffolk County, New York, had the highest at $59,484. Workers in Bristol County, Massachusetts, had a per capita income of $48,294 while workers in Washington County, Rhode Island, had a per capita income of $58,274 in 2015.

**Table 4.6-6. SFWF and SFEC Employment Characteristics**

| Entity | Labor Force 2017 | Employment 2017 | Unemployment 2017 | Unemployment Rate 2017 | Per Capita Personal Income 2015 |
|---|---|---|---|---|---|
| **NEW YORK** | 9,619,000 | 9,208,300 | 410,700 | 4.3 | $58,670 |
| Suffolk County | 778,500 | 747,600 | 30,900 | 4.0 | $59,484 |
| **RHODE ISLAND** | 550,225 | 530,162 | 20,063 | 3.6 | $50,018 |
| Washington County | 68,279 | 66,132 | 2,147 | 3.1 | $58,274 |
| Providence County | 321,738 | 308,922 | 12,816 | 4.0 | $44,399 |
| **MASSACHUSETTS** | 3,686,700 | 3,534,100 | 152,600 | 4.1 | $ 62,603 |
| Bristol County | 296,608 | 281,809 | 14,799 | 5 | $ 48,294 |

Source: New York State Department of Labor, 2017; Rhode Island Department of Labor and Training, 2017; Massachusetts Executive Office of Labor and Workforce Development, 2017

### 4.6.1.2 Potential Impacts

Project-related activities and infrastructure that could potentially result in direct or indirect impacts to population, economy, and employment resources were identified as part of the IPF analysis in Section 4.1. Those IPFs that could result in short-term or long-term impacts are indicated in Figure 4.6-1. IPFs that will not impact population, economy, and employment are depicted with slashes through the circle and are not discussed further. IPFs with potential impacts negligible and greater are evaluated in this section.

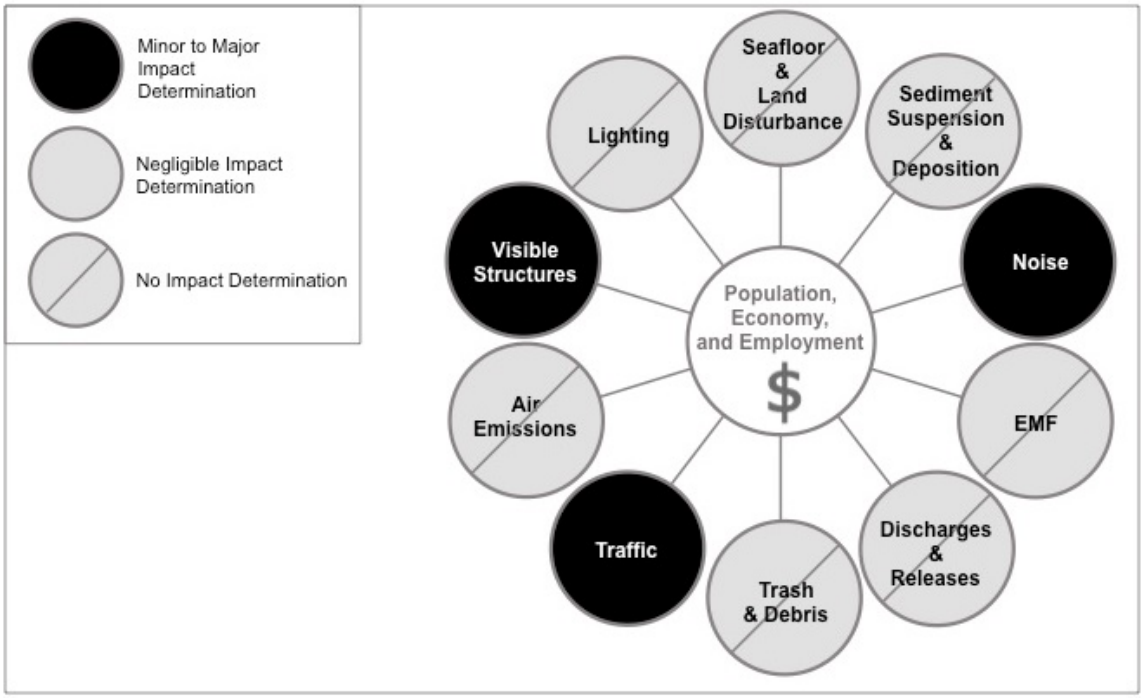



**Figure 4.6-1. Impact-producing Factors on Population, Economy, and Employment**

Table 4.6-1 summarizes the local communities, counties, and states in the overall Socioeconomic ROI, which includes Population, Economy, and Employment; impacts to these resources will result from the need for varying levels of local and nonlocal workers, goods, and services during each phase. Further, those local economies dependent on recreation and tourism (see Table 4.6-1) could be impacted by visible structures.

Expected job creation from development of the offshore wind industry in the Northeast was recently described in the report, U.S. Job Creation in Offshore Wind, that was prepared for the NYSERDA and reflected collaboration with representatives of the Massachusetts Department of Energy Resources, the MassCEC, and the Rhode Island Office of Energy Resources (BVG, 2017). DWSF will hire local workers to the extent practical for SFWF and SFEC management, fabrication, and construction. Non-local construction personnel typically include mariners, export cable manufacturing personnel, and other specialists who may temporarily relocate during the construction and decommissioning. Population impacts to the communities in the socioeconomic ROI could result primarily from the short-term influx of construction personnel. The total population change will equal the total number of non-local construction workers plus any family members that may accompany them. However, because of the short duration of construction activities, it is unlikely that non-local workers will relocate families to the area.

Table 4.6-7 summarizes the potential impacts to population, economy, or employment during the construction, O&M, and decommissioning phases of the SFWF and SFEC that are described in further detail in the following sections.

**Table 4.6-7. SFWF and SFEC Population, Economy, and Employment Impact Summary**

| Resource Area | Population | Economy | Recreation and Tourism Economies | Employment |
|---|---|---|---|---|
| ***SFWF*** | | | | |
| Construction / Decommissioning | Negligible | Negligible | Short-term, Negligible to minor | Short-term, Minor |
| Operation and Maintenance | Negligible | Negligible | Negligible | Negligible |
| ***SFEC – OCS / NYS*** | | | | |
| Construction / Decommissioning | Negligible | Negligible | Short-term, Negligible to minor | Short-term, Minor |
| Operation and Maintenance | Negligible | No impact | No impact | Negligible |
| ***SFEC – NYS ONSHORE*** | | | | |
| Construction / Decommissioning | Negligible | Negligible | Short-term, Negligible to minor | Short-term, Minor |
| Operation and Maintenance | Negligible | Negligible | Negligible | Negligible |

### South Fork Wind Farm

Construction and decommissioning activities may result in ***short-term, negligible*** to ***minor impacts*** to the population and local economies dependent on tourism and recreation from increased noise, traffic, noise, and visible structures. There is the potential for ***long-term, negligible impacts*** from noise and visible structures during O&M. Section 4.1.3 discusses noise that could be generated and Section 4.1.7 discusses marine vessel and land traffic that could be generated.

#### *Construction*

**Noise and Traffic**

***Short-term, negligible impacts*** to the population from noise during construction could occur; however, these impacts will be localized and limited to the staging area ports and construction of the O&M facility. There will be increased marine vessel (e.g., tugs and barges transporting construction materials and smaller support vessels carrying supplies and crew) and vehicular traffic (e.g., delivery trucks carrying construction equipment and supplies and automobiles used for daily commuting to various work sites). However, the number of additional trips during the construction phase of the SFWF may be ***negligible*** relative to the existing conditions and ***short-term*** in duration; therefore, impacts to the population and economy because of traffic will be ***short-term*** and ***negligible***.

**Visible Structures**

***Short-term, negligible to minor impacts*** to the economy and employment of the region are anticipated because of the size of the non-local construction workforce relative to existing conditions and because the SFWF will be constructed using multiple ports and access locations in different states (Table 4.6-1). Section 4.5, Visual Resources, and Appendix V, Visual Impact

Assessment Report for the SFWF, characterize the visible structures associated with construction of the SFWF. Visibility of the WTG construction activities will generally be limited those recreating or working offshore, which is not expected to impact the overall population, economy, or employment. Construction of the O&M facility in either Montauk, New York or Rhode Island as well as activities at the staging area ports have the potential to change existing visual resources in a measurable fashion. However, depending on the timing and location of the staging and construction activities, there could be ***short-term, negligible*** to ***minor impacts*** on the local economies dependent on recreation and tourism.

***Operations***

**Noise and Traffic**
There would be periodic ***negligible impacts*** to the population from support O&M activities at the staging ports used for significant maintenance activities.

**Visible Structures**
Similarly, the ***long-term impacts*** to economy and employment will be ***negligible*** because of the limited number of staff and goods and services needed to operate and maintain the SFWF. ***Negligible, long-term impacts*** on the local economies dependent on recreation and tourism are anticipated because it is assumed the O&M facility will be sited and designed to be consistent with adjacent land uses to minimize the visible structures seen by visitors.

***Decommissioning***

Decommissioning of the SFWF could have similar ***short-term, negligible impacts*** as construction in terms of increased traffic, noise, and visible structures impacts.

**South Fork Export Cable**

**SFEC – OCS and SFEC – NYS**

The SFEC – OCS and SFEC – NYS are not expected to have long-term impacts on population, economy, and employment during construction or decommissioning; however, there may be the potential for limited ***long-term, negligible impacts*** from noise and visible structures associated with the SFEC –Interconnection Facility and activities at the staging ports. Construction and decommissioning activities may result in ***short-term, negligible*** to ***minor impacts*** because of increased traffic and noise.

***Construction***

**Noise**
Impacts from noise are expected to be ***short-term*** and ***localized***, generally resulting from traffic or construction equipment near the construction areas along the southeast coast of Long Island. ***Short-term, negligible impacts*** to the population and local tourism and recreation economies from noise during construction could occur; however, these impacts will be local to the vicinity of the landing site and to the staging ports. There may be ***short-term, negligible impacts*** associated with construction depending on the duration and timing of these activities with the local tourism season and the location of the landing site.

**Traffic**
***Short-term, negligible impacts*** to the economy and employment of the region may occur from construction of the SFEC because of the size of the non-local construction workforce relative to existing conditions and because the SFWF will be constructed using multiple ports and access

locations in different states (Table 4.6-1). Section 4.1.7 discusses marine vessel and land traffic that could be generated by the SFEC – OCS and SFEC – NYS construction. There will be increased marine vessel (e.g., tugs and barges transporting construction materials, export cable laying barges, and smaller support vessels carrying supplies and crew) and vehicular traffic (e.g., delivery trucks carrying construction equipment and supplies, export cable-laying equipment, and automobiles used for daily commuting to various work sites). It is anticipated that all large project components (e.g., WTG blades, foundation segments, nacelle, etc.) will be transported at sea, and not overland therefore not impacting terrestrial traffic. However, the number of additional trips during the construction phase of the SFWF will be ***negligible*** relative to the existing conditions and ***short-term*** in duration; therefore, impacts because of traffic will be ***short-term*** and ***negligible***.

**Visible Structures**
*As described for the SFWF,* ***Short-term, negligible to minor impacts*** to the economy and employment of the region are anticipated because of the size of the non-local construction workforce relative to existing conditions and because the SFWF will be constructed using multiple ports and access locations in different states.

### *Operations and Maintenance*

***No long-term impact*** on the population, economy, and employment will result from O&M because limited maintenance activities are expected.

### *Decommissioning*

Decommissioning of the SFEC – OCS and SFEC – NYS could have similar ***impacts*** as construction, depending on the duration and timing of these activities with the local tourism season and location of the landing site.

## SFEC – Onshore

The SFEC – Onshore is not expected to have long-term impacts on population, economy, and employment during construction or decommissioning; however, there may be the potential for limited ***long-term, negligible impacts*** from noise and visible structures associated with the new interconnection facility. Construction and decommissioning activities associated with the SFEC – Onshore result in ***short-term, negligible impacts*** because of increased traffic, noise, and visible structures.

### *Construction*

**Noise**
Impacts from noise will be short-term, generally resulting from traffic or construction equipment. ***Short-term, negligible impacts*** to the population from noise during construction could occur; however, these impacts will be limited to the construction areas along the onshore export cable installation route, the landing site for the export cable, and near the SFEC – Interconnection Facility construction site.

**Traffic**
There will be ***short-term, negligible impacts*** to the economy and employment of the region from construction of the SFEC - Onshore because of the size of the non-local construction workforce relative to existing conditions. There will be increased vehicular traffic (e.g., delivery trucks carrying construction equipment and supplies, construction and export cable-laying equipment,

and automobiles used for daily commuting to various work sites) traffic. It is anticipated that all large project components (e.g., WTG blades, foundation segments, nacelle, etc.) will be transported at sea, and not overland therefore not impacting terrestrial traffic. This may result in ***short-term, negligible impacts*** because of increased traffic during the construction of the interconnection facility and the onshore export cable installation. The scale of these impacts will depend on the location of the landing site and whether construction is timed to avoid traffic associated with the summer tourism season.

**Visible Structures**
Visible structure impacts associated with construction of the SFEC – Onshore would be ***short-term, negligible*** and will be limited to the interconnection facility construction area and the activities along the onshore export cable installation route. The scale of these impacts will depend on the onshore export cable landing site and whether construction is timed to avoid traffic associated with the summer tourism season.

***Operations and Maintenance***

There may be ***long-term, negligible impacts*** to the population from the limited amount of noise generated from the new interconnection facility in Suffolk County, New York. However, this noise is not expected to be above the level of the existing, adjacent substation.

The use of wind to generate electricity reduces the need for electricity generation from new traditional fossil fuel powered plants on the South Fork of Long Island that produce greenhouse gas emissions.

***Decommissioning***

Decommissioning of the SFEC – Onshore could have similar ***short-term, negligible impacts*** as construction in terms of increased traffic, noise, and visible structures impacts, assuming the SFEC – Onshore components are removed by similar methods and equipment as construction. Potential minor impacts will be associated with decommissioning of the export cable landing site component and will be dependent on the timing of these activities to avoid the summer tourism season.

#### 4.6.1.3 Proposed Environmental Protection Measures

Several environmental protection measures will reduce potential impacts to population, economy, and employment.

- Where possible, local workers will be hired to meet labor needs for Project construction, O&M, and decommissioning.
- The location of the SFWF WTGs restricts available views from visually sensitive public resources and population centers.
- The SFEC - Onshore construction schedule has been designed to minimize impacts to the local community during the summer tourist season.
- At the SFEC - Interconnection Facility, additional screening will further reduce potential visibility and noise.
- New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.

## 4.6.2 Housing and Property Values

The potential impacts of the SFWF and SFEC on housing and property values are described in this section. Housing and property value information for those communities potentially impacted by the construction, O&M, or decommissioning of the SFWF and SFEC is also presented in this section. The affected environment is the same for the SFWF and the SFEC (Table 4.6-1) although impacts will be described separately. Data on the number of housing units, their vacancy status, and median housing values and gross rent from the 2015 ACS (5-year average of 2011 to 2015) are described. The vacancy status of the region's housing serves as a good indicator of the housing market and whether nonlocal construction workers will be able to find short-term accommodations. The USCB defines a housing unit as "a house, an apartment, a mobile home, a group of rooms or a single room that is occupied (or, if vacant, intended for occupancy) as separate living quarters" (USCB, 2015c). Boats, recreational vehicles (RVs), vans, tents, and other similar quarters are only included if they are occupied as a current place of residence.

### 4.6.2.1 Affected Environment

#### Regional Overview

The socioeconomic ROI for housing and property values includes those communities that could be impacted by the construction, O&M, or decommissioning of the SFWF and SFEC (Table 4.6-8). The socioeconomic ROI for property values also includes Newport County in Rhode Island and Bristol and Dukes Counties in Massachusetts (included in the Visual Impact Assessment Report for the SFWF, Appendix V) because each is between 20 and 30 miles from the SFWF and SFEC. Literature reviewed by BOEM indicates that geographies with significant residential development along their coasts may be particularly sensitive to changes in property values because of an offshore wind development (ICF, 2012).

#### South Fork Wind Farm and South Fork Export Cable

##### *Housing*

Table 4.6-8 summarizes the total number of housing units, vacant units, vacancy rates for rentals and ownership, as well as their corresponding median value or gross rent. Suffolk County, New York, had 570,194 housing units in 2015 – 76,345 of which were vacant (USCB, 2015d). Homeowner vacancy rates were consistently low, 3 percent or less. Meanwhile, rental vacancy rates were generally higher and more varied, with 34 percent in the Montauk CDP, 10 percent in the town of East Hampton, and 0 percent in East Hampton North and Wainscott CDP. In 2015, there were 62,722 housing units in Washington County, Rhode Island – 13,158 of which were vacant (USCB, 2015d).

**Table 4.6-8. SFWF and SFEC Housing Characteristics**

| Entity | Total Housing Units | Vacant Housing Units | Homeowner Vacancy Rate | Rental Vacancy Rate | Median Value (dollars) | Median Gross Rent (dollars) |
|---|---|---|---|---|---|---|
| **NEW YORK** | **8,171,725** | **909,446** | **1.8** | **4.3** | **283,400** | **1,132** |
| *Suffolk County* | 570,194 | 76,345 | 1.4 | 4.6 | 375,100 | 1,544 |

**Table 4.6-8. SFWF and SFEC Housing Characteristics**

| Entity | Total Housing Units | Vacant Housing Units | Homeowner Vacancy Rate | Rental Vacancy Rate | Median Value (dollars) | Median Gross Rent (dollars) |
|---|---|---|---|---|---|---|
| Town of East Hampton | 21,841 | 12,410 | 2 | 10.4 | 812,700 | 1,598 |
| East Hampton North CDP | 2,578 | 921 | 0 | 0 | 742,300 | 1,228 |
| Montauk CDP | 4,685 | 2,951 | 0.7 | 33.9 | 792,400 | 1,342 |
| Wainscott CDP | 1,036 | 712 | 0 | 0 | 1,178,200 | 1338 |
| **RHODE ISLAND** | **462,900** | **52,298** | **1.9** | **6.2** | **238,000** | **925** |
| *Washington County* | 62,722 | 13,158 | 1.7 | 3 | 311,600 | 1,050 |
| Town of North Kingstown | 11,133 | 846 | 0.7 | 0 | 313,100 | 964 |
| *Providence County* | 263,890 | 25,606 | 2.2 | 7 | 211,200 | 887 |
| City of Providence | 71,080 | 9,599 | 3 | 7.4 | 177,100 | 913 |
| **MASSACHUSETTS** | **2,827,820** | **278,099** | **1.2** | **4.2** | **333,100** | **1,102** |
| *Bristol County* | 230,986 | 18,957 | 1.4 | 4.7 | 273,100 | 820 |
| City of New Bedford | 43,291 | 4,150 | 1.1 | 6.8 | 206,900 | 771 |

Source: USCB, 2015d

Table 4.6-9 summarizes the 2015 vacancy status in the SFWF and SFEC region by type for those units that could be available to nonlocal construction workers, that is, not those units already rented or sold. Because of the region's popularity as summer vacation destination, the coastal counties of Suffolk, New York, Washington, Rhode Island, and (to a lesser extent) Bristol County, Massachusetts each had large percentages of seasonal units (e.g., beach cottages) used for sports or recreation. Table 4.6-10 illustrates that there are many other vacant units in the study area, particularly in Bristol and Providence counties where they represent almost half of the vacant housing supplies. These other vacant units do not fall within the other USCB categories and are included in the housing analysis as a potential latent housing supply.

Table 4.6-9 summarizes only those vacant units that will be available to non-local construction workers; that is, not those units already rented or sold. However, it also illustrates the important role that "seasonal, recreational, or occasional use" and "other vacant" units play in the local housing supply of the Socioeconomic ROI. Approximately 85 percent of the vacant units in Suffolk County overall and 95 percent of the vacant units in the local communities are classified as one of these two uses (USCB, 2015b). Both are associated with seasonal tourism or secondary vacation homes, with other vacant units often used by a caretaker or janitor, while the availability of seasonal units would typically be quite limited during peak summer construction periods. Similarly, of the 846 vacant units noted in Table 4.6-8 for North Kingston, Rhode Island, a negligible number were reported "for rent", 56 units were "for sale," and the balance were split between seasonal and "other vacant" housing. North Kingston is aware of these

shortages in its housing supplies and produced an Affordable Housing Plan in 2005 to address these issues going forward (BC Stewart & Associates/Bay Area Economics, 2005).

**Table 4.6-9. SFWF and SFEC Vacant Housing Characteristics**

| Entity | Total | For Rent | For Sale Only | For Seasonal, Recreational, or Occasional Use | For Migrant Workers | Other Vacant |
|---|---|---|---|---|---|---|
| **NEW YORK** | **831,486** | **153,504** | **70,718** | **321,733** | **1,440** | **284,091** |
| *Suffolk County* | 72,940 | 4,986 | 5,763 | 47,804 | 254 | 14,133 |
| *Suffolk County % distribution* | | 7% | 8% | 66% | 0% | 19% |
| Town of East Hampton | 12,327 | 220 | 152 | 11,543 | 114 | 298 |
| East Hampton North CDP | 906 | - | - | 805 | 49 | 52 |
| Montauk CDP | 2,941 | 191 | 9 | 2,708 | - | 33 |
| Wainscott CDP | 709 | - | - | 673 | 14 | 22 |
| *Suffolk County, NY Community Subtotal* | 17,408 | 411 | 174 | 16,232 | 177 | 414 |
| *Suffolk County, NY Community % distribution* | | 2% | 1% | 93% | 1% | 2% |
| **RHODE ISLAND** | **48,979** | **10,876** | **4,746** | **17,919** | **35** | **15,403** |
| *Washington County* | 12,849 | 415 | 624 | 10,529 | 35 | 1,246 |
| *Washington County % distribution* | | 3% | 5% | 82% | 0% | 10% |
| Town of North Kingstown | 766 | - | 56 | 343 | - | 367 |
| *Providence County* | 23,526 | 8,521 | 2,914 | 1,285 | - | 10,806 |
| *Providence County % distribution* | | 36% | 12% | 5% | 0% | 46% |
| City of Providence | 8,809 | 3,275 | 666 | 444 | - | 4,424 |

**Table 4.6-9. SFWF and SFEC Vacant Housing Characteristics**

| Entity | Total | For Rent | For Sale Only | For Seasonal, Recreational, or Occasional Use | For Migrant Workers | Other Vacant |
|---|---|---|---|---|---|---|
| **MASSACHUSETTS** | **254,123** | **42,605** | **19,230** | **123,040** | **160** | **69,088** |
| *Bristol County* | 17,745 | 4,048 | 1,837 | 3,399 | 17 | 8,444 |
| *Bristol County % Distribution* | | 23% | 10% | 19% | 0% | 48% |
| City of New Bedford | 3,960 | 1,665 | 186 | 161 | - | 1,948 |

Source: USCB, 2015d

Other housing options will be short-term accommodations, which for purposes of this COP, are defined as hotel and motel rooms, and sites for RVs. Only a limited need for these short-term housing units is anticipated, primarily near the staging ports since the SFWF workforce will be housed offshore.

***Property Values***

Median home values in these communities were indicative of their reputation as part of the Hamptons, ranging from a high of $1,178,200 in Wainscott in 2015 to a low of $742,300 in East Hampton North. Overall, the median sales price in the Hamptons as of second quarter of 2017 was $1.1 million (408 sales); however, the town of East Hampton experienced a median sales price of $3,187,500, representing 13 sales (Town & Country, 2017). Housing and rental values tended to be more modest in Providence County, Rhode Island, and Bristol County, Massachusetts, than the balance of the study area. The median value of a housing unit in the city of Providence, Rhode Island, was $177,100. Meanwhile, the median value in New Bedford, Massachusetts was $206,900 in 2015. Similarly, the median gross rent was $913 in Providence, Rhode Island, and $771 in New Bedford (USCB, 2015d).

Table 4.6-10 summarizes the number of owner-occupied housing units across the SFWF and the SFWF region, and the percent distribution of their corresponding housing values in 2015 (USCB, 2015e). Of the 392,390 units in Suffolk County, New York, 4 percent were valued at under $99,999, compared to 17 percent of the overall housing in New York State. However, the number of units valued at greater than $500,000 was comparable at 24 percent and 23 percent, respectively. Dukes County in Massachusetts had the lowest percent (1 percent) of homes valued under $99,999 and highest percentage of units valued at greater than $500,000, 75 percent. Providence County, Rhode Island, and Bristol County, Massachusetts, had 6 to 7 percent of their owner-occupied units valued under this threshold and 4 to 8 percent at a value greater than $500,000.

**Table 4.6-10. SFWF and SFEC Housing Values**

| | New York | Suffolk County, NY | Rhode Island | Newport County, RI | Providence County, RI | Washington County, RI | Massachusetts | Bristol County, MA | Dukes County, MA |
|---|---|---|---|---|---|---|---|---|---|
| Total Number of Owner- Occupied Housing Units | 3,894,722 | 392,390 | 246,909 | 21,571 | 127,215 | 36,223 | 1,583,667 | 131,608 | 4,802 |
| Less than $99,999 | 17% | 4% | 6% | 4% | 7% | 4% | 4% | 6% | 1% |
| $100,000 to $124,999 | 6% | 1% | 4% | 1% | 6% | 2% | 2% | 2% | 0% |
| $125,000 to $149,999 | 5% | 1% | 6% | 2% | 8% | 1% | 3% | 2% | 0% |
| $150,000 to $174,999 | 6% | 2% | 11% | 3% | 14% | 3% | 5% | 6% | 0% |
| $175,000 to $199,999 | 4% | 2% | 9% | 3% | 11% | 4% | 5% | 7% | 0% |
| $200,000 to $249,999 | 7% | 7% | 18% | 12% | 20% | 14% | 12% | 19% | 2% |
| $250,000 to $299,999 | 7% | 11% | 14% | 14% | 13% | 18% | 13% | 19% | 1% |
| $300,000 to $399,999 | 14% | 29% | 16% | 22% | 13% | 25% | 22% | 22% | 9% |
| $400,000 to $499,999 | 11% | 18% | 7% | 12% | 5% | 11% | 13% | 10% | 11% |
| $500,000 to $749,999 | 13% | 15% | 6% | 15% | 3% | 11% | 14% | 6% | 39% |
| $750,000 to $999,999 | 5% | 5% | 2% | 5% | 1% | 3% | 4% | 1% | 19% |
| $1,000,000 to $1,499,999 | 2% | 2% | 1% | 3% | 0% | 1% | 2% | 0% | 9% |
| $1,500,000 to $1,999,999 | 1% | 1% | 0% | 1% | 0% | 0% | 1% | 0% | 3% |
| $2,000,000 or more | 2% | 1% | 1% | 2% | 0% | 1% | 1% | 0% | 5% |
| *Greater than $500,000* | *23%* | *24%* | *9%* | *27%* | *4%* | *17%* | *22%* | *8%* | *75%* |

Source: USCB, 2015e

#### 4.6.2.2 Potential Impacts

Impacts to housing are evaluated based on the pressure on housing resources that could result from an influx of non-local employees. During construction and decommissioning, housing for offshore workforce will be available on some of the offshore vessels. In addition, because of the availability of vacant housing as shown in Table 4.6-10, there should be adequate housing available within the socioeconomic ROI.

Based on the findings of Section 4.5 (Visual Resources), visibility of the SFWF and SFEC will be limited to approximately 2 percent of the land area within the 40-mile visual study area. Additionally, in locations where views of the SFWF may be available from land, the Project will be a minimum of 18 miles (20 km) distant, suggesting that the Project will be visible to a casual observer under clear conditions, but not the focus of attention (Sullivan, 2017). BOEM notes that degrading the natural resources that draw tourists and recreational users can result in negative economic impacts, particularly because of a change in the public's perception of the aesthetics of a location. However, this change in public perception is highly site-specific and can be negative, positive, or a mix of both (ICF, 2012). Recent studies in the United States vary, with most finding that study participants do not expect impacts to property values or substantial changes in coastal visitation:

- A study of approximately 1,000 respondents assessed the potential impact of offshore wind on property rentals in New Jersey (Schulman and Rivera, 2009). The majority of those responding, 76 percent, indicated that a wind facility would not impact rental properties, 13 percent thought it would be harder to rent properties while 10 percent believed it would be easier to rent properties with an offshore wind facility in the vicinity (Schulman and Rivera, 2009).
- A Goucher Poll of 671 Maryland residents conducted from September 14 to 17 of 2017 had similar results. It asked whether seeing wind turbines on the horizon from the beach in Ocean City make visitors less likely to vacation in Ocean City, more likely to vacation in Ocean City or no difference. Three-quarters, 77 percent, of these residents said that seeing wind turbines on the horizon would "make no difference" to them (Goucher, 2017).
- Another study conducted a choice experiment with individuals that recently rented vacation properties along the North Carolina coastline to assess the impacts of a utility-scale wind farm on their rental decisions (Lutzeyer et al., 2017). Their findings indicated that rental value losses of up to 10 percent are possible if a utility-scale wind farm is placed within 8 miles (12.8 km) of shore. Their results also indicated there is not a scenario where respondents would be willing to pay more to rent a home with turbines in view, and a substantial portion of the survey population would change their vacation destination if wind farms were placed within visual range of the beach.
- A recent BOEM report (2018) documented an effort to estimate the potential impact of offshore wind power on recreational beach use on the East Coast of the United States. Respondents fell into three groups: those unimpacted, those reporting that a project would have made their experience worse, and those reporting that a project would have made their experience better. The results indicated that, generally, the closer the wind power project was to shore, the more respondents reported that their experience would have been worsened. People were questioned about their reaction to wind power projects from distances ranging from 2.5 to 20 miles (4.0 to 32.2 km) offshore. At 12.5 miles (20.1 km) offshore, 20 percent of the respondents reported that their experience would have been worsened by the turbines, 13 percent reported that it would have been improved, and 67 percent reported no impact. At

20 miles (32.2 km), the shares were 10 percent worse, 17 percent better, and 73 percent no impact. The dominant reason reported for why an offshore wind power project would have made a beach experience worse was the visual disruption of the seascape. The dominant reason for why it would have made a beach experience better was knowing something good was being done for the environment.

While the findings in the Lutzeyer et al. (2017) study indicated that rental value losses are possible if a utility-scale wind farm is placed reasonably close to the shoreline, the SFWF will be over 19 miles (30 km) from Block Island, over 22 miles (35 km) from Martha's Vineyard, and over 23 miles (37 km) from mainland Massachusetts and Rhode Island. Further, the white color planned for the turbines generally blends well with the sky at the horizon and eliminates the need for daytime FAA warning lights or red paint marking of the blade tips.

Project-related activities and infrastructure that could potentially result in direct or indirect impacts to housing and property values were identified as part of the IPF analysis in Section 4.1. Those IPFs that could result in impacts to housing and property values are indicated on Figure 4.6-2.

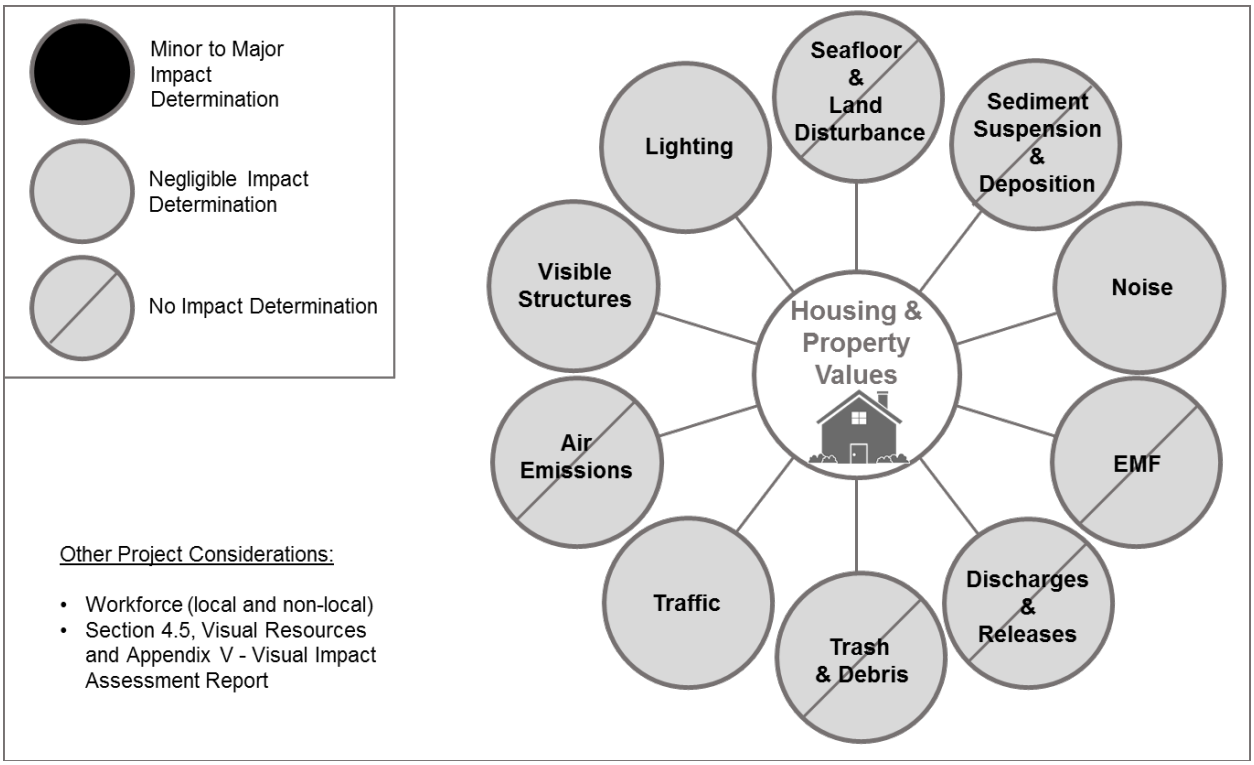



**Figure 4.6-2. Impact-producing Factors to Housing and Property Values**

### South Fork Wind Farm and South Fork Export Cable

The potential impacts on housing and property values are primarily associated with changes in the aesthetics of the marine viewshed and are summarized in Table 4.6-11. The results of the IPF analysis for Visible structures, Section 4.1.9, the results of the visual resources assessment in Visual Resources, Section 4.5, and in Appendices V, Visual Assessment Report-Onshore, and W, Visual Impact Assessment Report-Offshore, are used as a basis of the property value impact assessment.

**Table 4.6-11. SFWF and SFEC Housing and Property Value Impact Summary**

| Resource Area | Housing | Property Value |
|---|---|---|
| ***SFWF*** | | |
| Construction / Decommissioning | Short-term, negligible | Short-term, negligible |
| Operation and Maintenance | No impact | Negligible |
| ***SFEC – OCS / NYS*** | | |
| Construction / Decommissioning | Short-term, negligible | Short-term, negligible |
| Operation and Maintenance | No impact | No impact |
| ***SFEC – ONSHORE*** | | |
| Construction / Decommissioning | Short-term, negligible | Short-term, negligible |
| Operation and Maintenance | No impact | Negligible |

**Housing**

Based on plans to house most of the nonlocal construction and decommissioning workforce in short-term accommodations offshore (Section 3), sufficient short-term housing is available in each of the port options to meet the balance (Table 4.6-10, SFWF and SFEC Vacant Housing Characteristics). Therefore, impacts on the housing of the region could be ***short-term*** and ***negligible*** during construction and decommissioning of the SFWF. Similarly, the operation of the SFWF and SFEC will require a small, full-time, onshore staff over the 25-year life of the SFWF. The housing needs of these staff are minor relative to the overall size of the housing market in Suffolk County, New York; therefore, the Project will result in ***no impacts*** on the housing stock of the region during operation.

**Property Values**

As discussed, the potential for impacts to property values from the SFWF are limited by its distance from coastal residential properties and associated potential visibility. The SFWF will be over 19 miles (30 km) from Block Island, which already has the BIWF within its viewshed, and over 22 miles (35 km) from Martha's Vineyard and the mainland coasts of Massachusetts and Rhode Island. Therefore, the overall impact of the SFWF visible structures on property values is determined to be **negligible** in all phases. Similar ***negligible, localized, short-term impacts*** are possible from the construction and decommissioning of the SFEC for those residential properties adjacent to the new substation and SFEC – Onshore installation. ***Negligible, localized, long-term impacts*** are possible to the property values of those residential properties near the new substation due to noise and the potential for limited visibility.

#### 4.6.2.3 Proposed Environmental Protection Measures

Several environmental protection measures will reduce potential impacts to housing and property values.

- The SFEC - Onshore cable will be buried; therefore, minimizing potential impacts to adjacent properties.
- The location of the SFWF WTGs restricts available views from visually sensitive public resources and population centers.
- The SFEC - Onshore construction schedule has been designed to minimize impacts to the local community during the summer tourist season.
- At the SFEC - Interconnection Facility, additional screening may be considered to further reduce potential visibility and noise.
- New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.

## 4.6.3 Public Services

Public services for those communities potentially impacted by the construction, O&M, or decommissioning of the SFWF and SFEC are presented in this section. A wide range of public services exist in each of the geographies listed in Table 4.6-1 because of the density of the existing population and proximity of other land uses that necessitate such services (Table 4.6-1). Therefore, this section is focused on those fire, emergency medical services (EMS), and law enforcement services that will either support one of the staging ports will support onshore construction of the SFEC, or will serve the SFWF O&M facility in Suffolk County, New York or Washington County, Rhode Island.

#### 4.6.3.1 Affected Environment

The affected environment is the same for the SFWF and the SFEC; the impacts for each of these Project components are discussed in separate subsections. Each of the following Multi-Hazard Mitigation Plans, or strategies, was also referenced to identify the public service providers for the region:

- Suffolk County's municipalities, tribes, and Water Authority updated its 2008 Multi-Jurisdictional Multi-Hazard Mitigation Plan in 2014, providing a recent inventory of public services in the county (TetraTech, 2014).
- Public services for the Quonset Business Park – Port of Davisville port facility are characterized in the corresponding Multi-Hazard Mitigation Strategy for North Kingston, which was developed with input from a stakeholder committee that included the Harbormaster and a member of the Quonset Development Corporation (North Kingston and RIEMA, 2013).
- Public services for the ProvPort port facility are characterized in the corresponding Multi-Hazard Mitigation Strategy for the City of Providence (PLHMC and Maguire, 2013).
- Public services for the New Bedford Marine Commerce Facility are described in the City of New Bedford Local Multi-Hazard Mitigation Plan Update (New Bedford, 2016).

### Regional Overview

The socioeconomic ROI for public services includes those communities that could be impacted by the construction, O&M, or decommissioning of the SFWF and SFEC (Table 4.6-1). Specifically, those communities either represent potential staging ports for the SFWF and SFEC; the route for construction of the SFEC – Onshore; the SFEC – Interconnection Facility, or the SFWF O&M Facility.

### South Fork Wind Farm and South Fork Export Cable

Multiple hospitals serve the communities in the ROI. Table 4.6-12 identifies those facilities either closest to anticipated Project construction and operation activities, or those serving as trauma centers for emergency response purposes. The eastern portion of Suffolk County, New York near Montauk is served by multiple hospitals. University Hospital (State University of New York) in Stony Brook is the closest large trauma center and has approximately 600 beds (U.S. News & World Report, 2017). Both Southampton Hospital to the east of East Hampton and Eastern Long Island Hospital to the north in Greenport have 80 to 90 beds and offer emergency room access (Table 4.6-12). The Quonset Business Park – Port of Davisville port facility is primarily served by the Kent County Memorial Hospital in Warwick has 318 beds. Meanwhile, ProvPort is served by Rhode Island Hospital, which offers 650 beds. St. Luke's Hospital (Southcoast Hospitals Group) is the closest hospital to the New Bedford Marine Commerce Facility and has approximately 290 beds. New Bedford EMS transports most of its patients to St. Luke's during peak periods; and for high-level trauma and cardiac care, cases are transported to Providence (FACETS Consulting, 2015).

**Table 4.6-12. Hospitals in the Study Area: Selected Statistics**

| | East Hampton, NY | East Hampton, NY | East Hampton, NY | North Kingston, RI | Providence, RI | New Bedford, MA |
|---|---|---|---|---|---|---|
| | ***Construction of the SFEC and SFWF O&M Facility*** | | | ***SFWF Construction – Fabrication, Assembly, and Logistics*** | | |
| Hospital | Southampton Hospital | Eastern Long Island Hospital | University Hospital State University of New York | Kent County Memorial Hospital | Rhode Island Hospital | St. Luke's Hospital |
| Address | 240 Meeting House Lane Southampton, NY 11968 | 201 Manor Place Greenport, NY 11944 | 101 Hospital Road Health Sciences Ctr Stony Brook, NY 11794 | 455 Tollgate Road Warwick, RI 02886 | 593 Eddy Street Providence, RI 02903 | 101 Page Street New Bedford, MA 02740 |
| Phone | 631-726-8200 | 631-477-1000 | 631-444-1077 | 401-737-7000 | 401-444-4000 | 844-744-5544 |
| Beds | 80 | 90 | 603 | 318 | 650 | 293 |
| Admissions | 5,124 | 2,581 | 33,891 | 14,560 | 35,372 | N/A |
| Emergency Room Visits | 24,251 | 8,642 | 99,165 | 70,177 | 147,232 | 90,000 |

Source: U.S. News & World Report, 2017

The Suffolk County, New York, Department of Fire, Rescue, and Emergency Services (FRES) is responsible for providing emergency services (Suffolk County FRES, 2017). The eastern end of Suffolk County is served by three fire departments and an EMS association (Table 4.6-13). Volunteer fire and EMS services are provided by the Montauk Fire District, which is comprised of six companies (Montauk Fire District, 2017). Law enforcement services in Suffolk County overall are provided by the Suffolk County Police Department (PD). In 2014, the Suffolk County PD had more than 2,500 sworn officers and 500 civilian members (TetraTech, 2014). Precinct 7, located in Shirley, New York, is the closest Suffolk County PD and serves the town of Brookhaven (Suffolk County PD, 2017). Suffolk County communities further to the east are served by 11 independent police forces. The town of East Hampton PD has a precinct in Montauk as well as a Public Safety Dive Team that trains and coordinates with associated agencies such as the Town Marine Patrol, Town Wide Dive Team, Town Ocean Rescue Team, and the USCG Group Montauk (East Hampton PD, 2017). The East Hampton Fire Department (FD) provides fire response in the town with 6 companies and 145 volunteers (East Hampton FD, 2017). Emergency medical services in East Hampton are provided by two ambulance services, one in Sag Harbor and one in East Hampton Village. The East Hampton Village EMS is staffed by 36 members and utilizes 9 on-call (not in-house) squads to serve the southern and eastern portions of the Village (East Hampton Village Ambulance, 2017). The Amagansett FD serves 12 square miles (31 $km^2$) of land and more than 18 miles (47 km) of ocean and bay shoreline with six companies that include an Ambulance Squad, Rapid Intervention Team for structure fires, and Heavy Rescue Squad (Amagansett FD, 2017).

**Table 4.6-13. Fire and EMS Services in Eastern Suffolk County, New York: Selected Statistics**

| Responsible Entity | Montauk Fire District | East Hampton Fire Department | East Hampton Village EMS | Amagansett Fire Department |
|---|---|---|---|---|
| Address | 12 Flamingo Avenue Montauk, NY 11954 | 1 Cedar Street East Hampton, NY 11937 | 1 Cedar Street East Hampton, NY 11937 | 439 Main Street Amagansett, NY 11930 |
| Phone | 631-668-5695 | 631-324-0124 | 631-907-9796 | 631-267-3300 |
| Department (Type) | Volunteer | Volunteer | Paid | Volunteer |
| Number of Companies or Squads / Personnel | 5/117 | 6/145 | 9/36 | 5/100 |
| Number of EMS Units | 1 | 0 | 3 | 1 |

Source: Montauk Fire District, 2017

Fire and EMS services specific to the three SFWF and SFEC port options are summarized in Table 4.6-14. Fire and EMS services for the Quonset Business Park – Port of Davisville are provided by the town of North Kingston under a memorandum of agreement with Quonset Development Corporation. The North Kingstown PD maintains a staff of approximately 45 officers divided into 4 squads as well as 1 full-time harbormaster and 2 part-time assistant harbormasters. These harbormasters access a patrol boat berthed at the town wharf and an office located at PD headquarters (North Kingstown PD, 2017). ProvPort at the Port of Providence, Rhode Island, is operated by Waterson Terminal Services (WTS), which is responsible for general management and safety. Because of it being a maritime port, WTS has a security plan for

ProvPort with detailed procedures, while the Providence FD and PD provide emergency response (WTS, 2017). The New Bedford FD serves the New Bedford Marine Commerce Terminal. The New Bedford FD is responsible for protecting the port, helping prevent fires, and providing services to recover from fires, spills, severe weather events, and other circumstances (Port of New Bedford, 2017). The New Bedford FD is also responsible for administrative matters, such as ensuring tradesmen using the port have current permits. The Port of New Bedford is served by multiple layers of law enforcement, including the New Bedford PD, Massachusetts Environmental Police, USCG, and USACE. The New Bedford PD provides a marine detachment while the harbormaster's onsite agent is responsible for laws, rules, and regulations governing the harbor.

**Table 4.6-14. Fire and EMS Services associated with the SFWF / SFEC Port Options**

| Port Option | Quonset Business Park – Port of Davisville | ProvPort | New Bedford Marine Commerce Terminal |
|---|---|---|---|
| Address | 2574 Davisville Road North Kingstown, RI 02852 | 35 Terminal Road Providence, RI 02905 | 16 Blackmer Street New Bedford, MA 02744 |
| Local Government | North Kingston, RI | Providence, RI | New Bedford, MA |
| Responsible Entity | Quonset Development Corporation | Waterson Terminal Services (Private Corporation); ProvPort (Quasi-public Agency) | New Bedford Harbor Development Commission (City Agency); MassCEC (Quasi-public Agency) |
| **Provider of Fire Services** | North Kingston Fire Department, Station 6 | Providence Fire Department, Broad Street Station | New Bedford Fire Department, Station 2 |
| Phone | 401-294-3346 | 401-274-3348 | 508-991-6105 |
| **Provider of EMS Services** | North Kingston Fire Department | Providence Fire / EMS | New Bedford EMS Office |
| Phone | 401-294-3346 | 401-243-6050 | 508-991-6390 |
| **Provider of Law Enforcement Services** | North Kingstown Police Department | Providence Police Department | New Bedford Police Port Security |
| Phone | 401-294-3316 | 401-243-6401 | 508-989-2925 |

Sources: Montauk Fire District, 2017; MassCEC, 2017

### 4.6.3.2 Potential Impacts

Potential impacts on public services are discussed in this section with impacts driven by the potential for an increased demand for emergency response services because of the construction of the SFWF and SFEC and by the presence of non-local workers in the region. IPFs that could result in impacts to public services are indicated on Figure 4.6-3. Of these, only the traffic (vessels, vehicles, and air) IPF was evaluated for public services. Section 4.1.7 discusses marine

vessel and land traffic that could be generated by construction, which could include earthmoving equipment for the onshore export cable installation, small materials delivery trucks, and commuter vehicles.

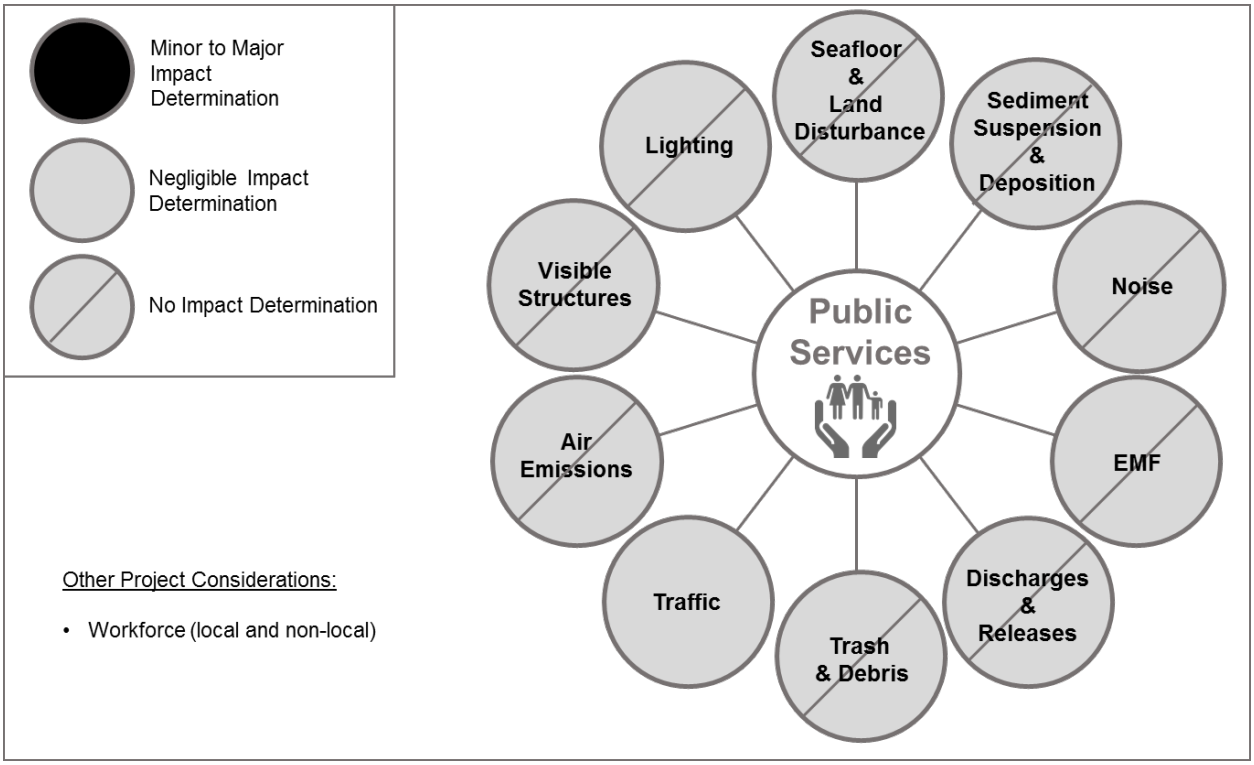



**Figure 4.6-3. Impact-producing Factors on Public Services**

## South Fork Wind Farm

### *Construction, Operations and Maintenance, and Decommissioning*

**Traffic**

Construction and decommissioning of the SFWF is not expected to impact the level of public services provided in the region given public services offered at each of the port options and DWSF's plans to house most non-local workers in short-term accommodations offshore. Therefore, ***short-term, negligible impacts*** on the public services of the region are anticipated during construction and decommissioning of the SFWF.

The operation of the SFWF will require a small, full-time, onshore staff over the 25-year life of the SFWF. The needs of these staff would be minor relative to the overall size of the demand for public services in Suffolk County, New York; therefore, the SFWF will result in ***long-term, negligible impacts*** on the public services during operation.

## South Fork Export Cable

## SFEC – OSC and SFEC - NYS

### *Construction, Operations and Maintenance, and Decommissioning*

**Traffic**

While construction and decommissioning of the SFEC – OCS and SFEC – NYS is expected to generate localized marine vessel or vehicular traffic, this increase is not expected to generate the need for additional public services in the region nor interrupt existing services. Similarly, by providing short-term accommodations offshore for the workforce, the demand for additional

local public services such as EMS will be short-term and limited. Therefore, there could be ***short-term, negligible impacts*** on public services during construction and decommissioning of the SFEC – OCS and SFEC – NYS. After the SFEC is decommissioned, the area is expected to recover to pre-Project conditions.

The submarine export cable is not expected to have maintenance needs unless a fault or failure occurs. Export cable failures are only anticipated because of damage from outside influences, such as unexpected digs from other parties. If repair is needed, spare submarine export cable and splice kits will be used to replace the impacted area. Therefore, public services are not expected to be impacted during O&M unless repairs are needed; therefore, the operation of the SFEC – OCS and SFEC – NYS could have ***negligible impacts*** on public services.

**SFEC – OSC and SFEC - NYS**

***Construction, Operations and Maintenance, and Decommissioning***

**Traffic**
There may be a short-term increase in truck and construction equipment traffic on routes used for the SFEC – Onshore as well as limited number of nonlocal workers. Therefore, there may be localized, ***short-term, negligible impacts*** on public services such as EMS or police during construction and decommissioning. After the SFEC is decommissioned, the area is expected to recover to pre-Project conditions.

O&M of the SFEC – Interconnection Facility is expected to be similar to the O&M of the existing LIPA substation in East Hampton. Therefore, the operation of the SFEC – Onshore may have ***negligible impacts*** on public services.

#### 4.6.3.3 Proposed Environmental Protection Measures

Several environmental protection measures will reduce potential impacts to public services.

- The SFEC - Onshore construction schedule has been designed to minimize impacts to the local community during the summer tourist season.
- New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.
- DWSF will also coordinate with local authorities during SFEC – Onshore construction to minimize local traffic impacts.
- A comprehensive communication plan will be implemented during offshore construction. DWSF will submit information to the USCG to issue Local Notice to Mariners during offshore installation activities.

### 4.6.4 Recreation and Tourism

This section describes the recreation and tourism resources that could be impacted by construction, O&M, or decommissioning of the SFWF and SFEC. Recreation and tourism in the socioeconomic ROI include both onshore activities, such as beach visitation and wildlife viewing, and offshore activities from or on a boat. Recreation and tourism can be inconvenienced by onshore and offshore construction activity and vessel movements. Enjoyment can be increased or decreased by the aesthetics of the SFWF and SFEC. Recreational activities, such as diving, can be enhanced by the colonization of the SFWF structures that act like fish-aggregating devices.

### 4.6.4.1 Affected Environment

#### Regional Overview

The socioeconomic ROI for recreation and tourism includes those communities that could be impacted by the construction, O&M, or decommissioning of the SFWF and SFEC (Table 4.6-1). This includes the coastal and port communities where construction activities will occur, where the O&M facility could be located, and those ports that support offshore recreational boating trips that frequent the waters near the RI-MA WEA. The socioeconomic ROI for tourism also includes Newport County in Rhode Island and Bristol and Dukes counties in Massachusetts based on the findings of the Visual Impact Assessment Report for the SFWF, Appendix V, and the relative contribution tourism makes to the local economy (Table 4.6-5).

#### South Fork Wind Farm and South Fork Export Cable

##### *Onshore Recreation and Tourism*

Table 4.6-15 provides a synopsis of the major features that make these onshore communities recreation and tourism destinations, including major tourist attractions and festivals. The synopsis notes the coastal features adjacent to the community, how it is accessed, and whether its population varies seasonally. Block Island, part of Washington County, Rhode Island, is the community closest to the SFWF and SFEC and is accessible only by air or boat, primarily for day trips. Ferry access is available from New London, Connecticut, Montauk on Long Island, New York, Newport, Rhode Island, and Point Judith, Rhode Island (ICF, 2012). Newport County, located on the eastern side of the entrance to Narragansett Bay from Rhode Island Sound, is world-renowned as a sailing and yachting destination, as well as for its jazz and folk music festivals. Further to the west, Suffolk County, New York, is the outermost county on Long Island with multiple summer vacation destinations including Montauk and the Hamptons. Montauk is most easily accessed by ferry from the north from Bridgeport and New London, Connecticut, as well as to Block Island, Rhode Island, from Montauk and Bay Shore-Fire Island, New York.

**Table 4.6-15. Summary of Recreation and Tourism Resources by Community**

| | Community Synopsis | Resources | Festivals |
|---|---|---|---|
| ***RHODE ISLAND*** | | | |
| Block Island | • Serves as general boundary for Rhode Island and Block Island sounds<br>• Town of New Shoreham has seasonal population influx; however, majority of tourism is day trips only<br>• Ferry and air access only; ferries to Block Island arrive from New London, CT, Montauk on Long Island, NY, Newport, RI, and Point Judith, RI (Washington County) | Undeveloped beaches, Block Island NWR, New Shoreham waterfront | Block Island Race Week, Block Island Music Festival, 15k Run Around the Block, Clam Bake |

**Table 4.6-15. Summary of Recreation and Tourism Resources by Community**

| | Community Synopsis | Resources | Festivals |
|---|---|---|---|
| Newport County | • Eastern side of Narragansett Bay and northern edge of Rhode Island Sound and Atlantic<br>• Includes City of Newport with ferries to Block Island and Point Judith<br>• World renowned sailing and yachting destination | Touro Synagogue National Park, Sachuest Point NWR, Newport Mansions, Fort Adams State Park, Second Beach and Easton Beach (Aquidneck Island), South Shore, Sakonnet Point, and Fogland beaches (mainland) | Newport Kite Festival, Black Ships Festival, Newport Folk and Jazz Festivals, multiple boating races |
| Providence County | • Northernmost shoreline along the Narragansett Bay<br>• City of Providence<br>• Coastline is almost entirely industrial, including ProvPort | Roger Williams National Memorial | Waterfire |
| Washington County | • Western side of Narragansett Bay and northern edge of Rhode Island Sound and Atlantic<br>• Includes Block Island Hotspot<br>• Point Judith, RI, ferry serves Block Island and Montauk, NY | Ninigret, Block Island, Trustom Pond and John H. Chafee NWRs, Westerly Armory Museum | Wickford Art Festival, Americas Cup |
| ***NEW YORK*** | | | |
| Suffolk County | • Outermost county on Long Island, on Long Island Sound, Block Island Sound, and the Atlantic Ocean<br>• Location of multiple summer vacation destinations, including Montauk and the Hamptons<br>• Ferry access from Bridgeport and New London, CT, and to Block Island, RI, from Montauk and Bay Shore-Fire Island | Fire Island National Seashore and Conscience Point National Park, Amagansett, Wertheim, and Elizabeth Morton NWRs, Montauk Point Lighthouse, Vanderbilt Museum | Seafood Festival and Craft Fair |
| ***MASSACHUSETTS*** | | | |
| Bristol County | • Segments of shoreline on Narragansett and Buzzards Bays (Rhode Island Sound) and on the Atlantic Ocean to the south<br>• City of New Bedford, historical whaling port<br>• Ferry route to Cuttyhunk in Dukes County, MA | New Bedford Whaling Museum, Battleship Cove in Fall River | Whaling City Festival, Feast of the Blessed Sacrament |

**Table 4.6-15. Summary of Recreation and Tourism Resources by Community**

| | Community Synopsis | Resources | Festivals |
|---|---|---|---|
| Dukes County | • Adjacent to Nantucket Sound and Buzzards Bays (Rhode Island Sound)<br>• Highly dependent on marine tourism, seasonal population influx<br>• Access by boat and plane only; ferry routes from two locations in Barnstable County, one to Bristol County, another to Washington County, RI, and a final weekend service from New York City. | Noman's Land Island NWR | Striped Bass and Bluefish Derby, Oak Bluffs Monster Shark Tournament, JawsFest |

Source: ICF, 2012

Table 4.6-16 provides a summary of the major resources each community offers to attract and support its recreation and tourism economy. There is a total of 148 public beaches within the region – 40 percent in New York, 45 percent in Rhode Island, and 15 percent are in Massachusetts. In Rhode Island, public beaches are prevalent on Block Island (Washington County) and in Newport County, which has a major tourism industry based on its beaches and sailing and yachting reputation. Suffolk County, New York, has more than half of the harbors, marinas, and yacht clubs found in the region.

**Table 4.6-16. Summary of Recreation and Tourism Resources by Community**

| | Harbors | Marinas | Yacht Clubs | Public Beaches | National Parks | Description |
|---|---|---|---|---|---|---|
| **Rhode Island-portion of ROI** | **8** | **35** | **12** | **68** | **2** | |
| Block Island* | 2 | 2 | 0 | 10 | 0 | Aquatic activities include swimming, surfing, snorkeling, and parasailing; fishing, sailing, and boating; wildlife viewing; kayaking along the beaches and through the tidal zones.<br>Onshore activities include hiking, horseback riding, and bicycling on 32 miles (51.5 km) of hiking trails. |
| Newport County | 4 | 13 | 3 | 18 | 1 | Beaches for sunbathing, walking, and swimming. Tourism draw is boating and yachting. |

**Table 4.6-16. Summary of Recreation and Tourism Resources by Community**

| | Harbors | Marinas | Yacht Clubs | Public Beaches | National Parks | Description |
|---|---|---|---|---|---|---|
| Providence County | 0 | 6 | 3 | 0 | 1 | Coastal recreation is minimal because the industrial waters of the inner bay provide for poor swimming and ocean recreation activities; adjacent parkland and East Bay Bicycle Path. |
| Washington County | 4 | 16 | 6 | 50 | 0 | Kayaking, sailing, and harbor cruises in Narragansett Bay; and sunbathing, beachcombing, swimming, and surfing on the Atlantic coast |
| **New York-portion of ROI** | **20** | **72** | **38** | **60** | **2** | |
| Suffolk County | 20 | 72 | 38 | 60 | 2 | 980 miles (1,577 km) of coastline; the majority is white sand beach for sunbathing, swimming, and beachcombing; popular among sportsmen and surfers |
| **Massachusetts-portion of ROI** | **7** | **22** | **8** | **20** | **1** | |
| Bristol County | 2 | 20 | 5 | 5 | 1 | Mostly private beach; while parts of the shore are rocky, approximately half is sand beach and caters to activities such as sunbathing and beachcombing |
| Dukes County | 5 | 2 | 3 | 15 | 0 | Popular activities include swimming, beachcombing, and sunbathing; surfing, diving, and boat- and shore-fishing. Several wooded trails for biking and hiking, as well as several areas (including two wildlife refuges) for bird and nature watching |
| **Total in ROI** | **35** | **129** | **58** | **148** | **5** | |
| **Distribution by State** | | | | | | |
| Rhode Island | 22% | 27% | 20% | 45% | 40% | |

**Table 4.6-16. Summary of Recreation and Tourism Resources by Community**

| | Harbors | Marinas | Yacht Clubs | Public Beaches | National Parks | Description |
|---|---|---|---|---|---|---|
| New York | 54% | 55% | 63% | 40% | 40% | |
| Massachusetts | 24% | 18% | 17% | 15% | 20% | |

Source: ICF, 2012

* Block Island counts are included for reference and are already represented in the Washington County counts.

The NPS administers the following sites in the region:

- Roger Williams National Memorial in Providence, Rhode Island, with 65,588 recreation visitors in 2016
- New Bedford Whaling National Historical Park in New Bedford, Massachusetts, with 145,500 visitors in 2016
- Fire Island National Seashore in Suffolk County, New York, with 431,303 visitors in 2016 (NPS, 2017)

The USFWS administers the following NWRs in the region:

- Amagansett NWR
- Conscience Point NWR
- Elizabeth Alexandra Morton NWR
- Seatuck NWR
- Trustom Pond NWR
- Wertheim NWR
- Block Island NWR (USFWS, 2017)

***Offshore Recreation and Tourism***

Offshore recreation within Rhode Island Sound and further offshore near the SFWF within the RI-MA WEA are described in detail in the OSAMP and the 2012 Northeast Recreational Boater Survey (RICRMC, 2010 and Starbuck et al., 2013). The 2012 Northeast Recreational Boater Survey characterized the boating patterns and economic activity of the 373,766 qualified registered boaters from coastal counties and towns in Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and New York, and included maps from the survey of 5,114 boating routes and 4,635 activity points (Starbuck et al., 2013). The survey estimated approximately 907,400 boating trips in ocean and coastal waters during 2012 for the registered and documented marine boaters of the six Northeast states (Table 4.6-17). Most of these trips, or 74 percent, were made by vessels registered in one of the three states in the SFWF and SFEC region. Of the 675,370 estimated boating trips in the study area in 2012, 10 percent were made by vessels registered in Rhode Island, 51 percent were registered in New York, and 39 percent in Massachusetts. Over half (52 percent) of these boating trips occur within 1 mile (1.6 km) of the coastline with higher levels of boating activity occurring in semi-protected bays and harbors near major cities, such as Narragansett Bay (Starbuck et al., 2013).

**Table 4.6-17. 2012 Boating Trips by State of Vessel Registration**

| | 2012 Estimated Boating Trips | % of Total | % of Study Area Total |
|---|---|---|---|
| Rhode Island | 65,042 | 7% | 10% |
| New York | 347,679 | 38% | 51% |
| Massachusetts | 262,649 | 29% | 39% |
| Maine | 67,605 | 7% | |
| New Hampshire | 22,430 | 2% | |
| Connecticut | 141,998 | 16% | |
| **Northeast Boater Survey Total** | **907,403** | | |
| ***SFWF and SFEC Study Area Total*** | ***675,370*** | ***74%*** | |

Source: Starbuck et al., 2012

The OSAMP provided offshore recreational maps of Rhode Island Sound based on stakeholder feedback, USCG event permits, and racing event instructions (RICRMC, 2010). Rhode Island Sound, and the adjacent waters of Block Island Sound, Narragansett Bay, Buzzards Bay, Long Island Sound, and the Atlantic Ocean provide a wide range of marine recreation and tourism opportunities (Table 4.6-16). Specifically, these waters are used for a variety of boat-based activities such as recreational boating, offshore sailboat racing, offshore diving, offshore wildlife viewing, and cruise ship tourism.

As described in Section 4.6.8, Other Marine Uses, Rhode Island Sound experiences a substantial amount of traffic of which sailing and cruising are only one component. Both the OSAMP and the Northeast Boater Survey identified commonly known boating routes of which the following either transect or are near the SFWF:

- Narragansett, Rhode Island, to Block Island, Rhode Island
- New London, Connecticut, to Block Island, Rhode Island
- Narragansett, Rhode Island, to Cuttyhunk, Massachusetts (Starbuck et al., 2013)
- Transatlantic, Caribbean, and Bermuda to Newport, Rhode Island
- Newport, Rhode Island, to Long Island Sound, New York, Vineyard Sound and Cape Cod Canal, Massachusetts (RICRMC, 2010)

Table 4.6-18 provides a characterization of the sailboat, distance, and buoy races that generally occur within the SFWF and SFEC region. Most of the races occur from May to September and have under 100 participants. The largest event is the Newport to Bermuda Yacht Race, which occurs in June and can have over 250 participants. The Off Soundings Club Spring Race Series often hosts up to 150 participants at its event in June off Block Island (ICF, 2012). The New York Yacht Club hosts multiple large race events each year, including its Annual Regatta, Race Week, and an Annual Cruise.

**Table 4.6-18 Sailboat, Distance, and Buoy Races in or Near Rhode Island Sound**

| Event | Organizer | Month | Frequency | Course Description | Avg. No. of Vessels | Avg. Vessel Length (feet [m]) |
|---|---|---|---|---|---|---|
| Block Island Race Week | Storm Trysail Club (odd years); Ted Zuse (even years) | June | Annual | Week of buoy races west of Block Island[a] | 100+ | 30-90 (9-27) |
| New York Yacht Club Annual Regatta | New York Yacht Club | June | Annual | Buoy races south of Brenton Point | 110 | 30-90 (9-27) |
| New York Yacht Club Invitational Cup | New York Yacht Club | Sept. | Biennial | Buoy races south of Brenton Point | 20 | 42 (12.8) |
| New York Yacht Club Race Week | New York Yacht Club | Sept. | Biennial | Buoy races south of Brenton Point | 150 | 30-90 (9-27) |
| Swan 42 National Championship | New York Yacht Club | July | Annual | Buoy races south of Brenton Point | 20 | 42 (12.8) |
| Sail Newport Coastal Living Newport Regatta | Sail Newport | July | Annual | Buoy races south of Brenton Point | Varies | Varies |
| World championship regattas (vary) b | Various | Sept. | Annual | Buoy races south of Brenton Point | Varies | Varies |
| Annapolis to Newport Race | Annapolis Yacht Club | June | Biennial | Annapolis, MD, to Newport | 61 | 34+ (10.3+) |
| Bermuda One-Two | Goat Island Yacht Club and Newport Yacht Club | June | Biennial | Singlehanded (one crew member): Newport to Bermuda; Doublehanded (two crew members): Bermuda to Newport | 38 | 28-60 (8.5-18.2) |
| Block Island Race | Storm Trysail Club | May | Annual | Stamford, CT, around Block Island and back to Stamford | 60 | 30-75 (9.1-22.8) |

**Table 4.6-18 Sailboat, Distance, and Buoy Races in or Near Rhode Island Sound**

| Event | Organizer | Month | Frequency | Course Description | Avg. No. of Vessels | Avg. Vessel Length (feet [m]) |
|---|---|---|---|---|---|---|
| Corinthians Stonington to Boothbay Harbor Race | Corinthians Association, Stonington Harbor Yacht Club, and Boothbay Harbor Yacht Club | July | Biennial | Stonington, CT, to Boothbay, ME | 14 | |
| Earl Mitchell Regatta | Newport Yacht Club | Oct. | Annual | Newport to Block Island | 15 | 30-50 (9.1-15.2) |
| Ida Lewis Yacht Club Distance Race | Ida Lewis Yacht Club | August | Annual | Multi-legged course through Rhode Island Sound and adjacent offshore waters | 40 | 30-90 (9.1-27.4) |
| Marion to Bermuda Cruising Yacht Race | Marion-Bermuda Cruising Yacht Race Association | June | Biennial | Marion, MA, to Bermuda | 48 | 32-80 (9.7-24.3) |
| New England Solo-Twin Championships | Newport Yacht Club and Goat Island Yacht Club[b] | July | Annual | Multi-legged course through Rhode Island Sound and adjacent offshore waters; starts and ends in Newport | 35 | 24-60 (7.3-18.2) |
| Newport Bucket Regatta | Bucket Regattas/ Newport Shipyard | July | Annual | Three multi-legged courses off Brenton Point | 19 | 68-147 (20.7-44.8) |
| Newport to Bermuda Race | Cruising Club of America | June | Biennial | Newport to Bermuda | 265 | 30-90 (9.1-27.4) |
| New York Yacht Club Annual Cruise | New York Yacht Club | August | Annual[c] | Varies | 100 | 30-90 (9.1-27.4) |

**Table 4.6-18 Sailboat, Distance, and Buoy Races in or Near Rhode Island Sound**

| Event | Organizer | Month | Frequency | Course Description | Avg. No. of Vessels | Avg. Vessel Length (feet [m]) |
|---|---|---|---|---|---|---|
| Offshore 160 Single-Handed Challenge | Newport Yacht Club and Goat Island Yacht Club | July | Biennial | Multi-legged course through Rhode Island Sound and adjacent offshore waters; starts and ends in Newport | 15 | 28-60 (8.5-18.2) |
| Off Soundings Club Spring Race Series | Off Soundings Club | June | Annual | Day 1: Watch Hill to Block Island<br>Day 2: Around Block Island | 120-150 | 23-62 (7-18.8) |
| Owen Mitchell Regatta | Newport Yacht Club | May | Annual | Newport to Block Island | 31 | 24-44 (7.3-13) |
| Vineyard Race | Stamford Yacht Club | Aug./Sept. | Annual | Stamford, CT, to entrance of Vineyard Sound and back to Stamford | 77 | 30-90 (9.1-27.4) |
| Whaler's Race | New Bedford Yacht Club | Sept. | Annual | New Bedford, MA, around Block Island, to Noman's Island, and back to New Bedford | 22 | 25+ (7.6+) |

Source: ICF, 2012

Note: Races start and/or end in Newport unless otherwise noted.

[a] Event may also include one around-the-island race.

[b] The Newport sailing community hosts at least one "world championship" regatta each September. In Meter World Cup and the Twelve Meter World Championships.

[c] Course varies widely; event is held within the OSAMP area waters approximately 3 out of every 5 years.

In addition to the recreational boating discussed, the offshore portion of the SFWF and SFEC region is used for offshore diving and wildlife viewing. The OSAMP identified 12 offshore recreational dive sites. None of these areas are near the SFWF and two, the U.S.S. Bass and a sulfur barge site, are near the SFEC route (RICRMC, 2010). Offshore wildlife viewing near the region includes whale watching (peak season in June and August) and bird watching (year-round but particularly after storm events).

Relative to the waters around Block Island, DWSF is in the process of conducting a multi-year study of recreational boating near the BIWF before, during, and after construction (INSPIRE,

2017). A preconstruction recreational boating survey was conducted in the summer of 2015, while a 2016 survey represented conditions during construction. The 2016 survey was conducted over the 2016 Fourth of July weekend (July 1 to 6) during which the Annual Block Island Race week was cancelled. A total of 1,030 vessel observations were recorded and the following data were obtained:

- Motorized recreational fishing vessels represented 72 percent of the total vessels observed.
- Sailboats were observed 26 times over all survey days, representing 3 percent of the total observed.
- Scuba diving and freediving activities were observed 8 times, less than 1 percent of the total observed.
- Five jet ski-style personal watercrafts (PWCs) were observed.
- Swimming, kayaking, and stand-up paddle boarding (SUP) were not observed (INSPIRE, 2017).

### 4.6.4.2 Potential Impacts

IPFs that could result in impacts to recreation and tourism values are indicated on Figure 4.6-4. Potential impacts of the SFWF and SFEC on recreation and tourism are evaluated in this section.

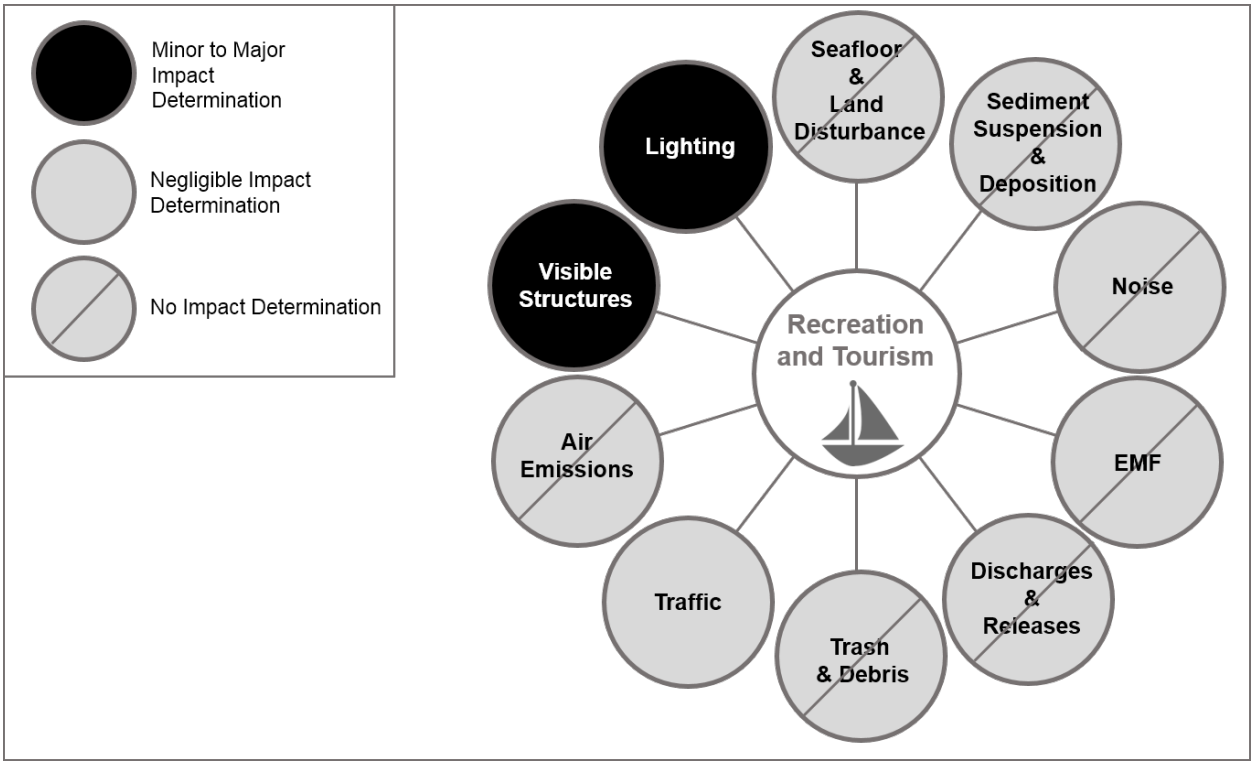



**Figure 4.6-4. Impact-producing Factors on Recreation and Tourism**

The potential for impacts from these IPFs result from changes to the natural resources (e.g., altered fishing, scuba diving, or sight-seeing conditions) or from the public perception of offshore wind facilities (e.g., interest in facility tours and preference for undeveloped landscapes) (ICF, 2012). As discussed in Section 4.6.3, Housing and Property Values, the scale of these impacts varies widely and can be positive or negative. Potential negative impacts could cause tourists to avoid a destination, such as a State Park, or could provide a new source of coastal

tourism and draw new visitors, as demonstrated by Block Island. The Block Island Ferry now offers hour-long high-speed cruises with a narrated tour of the BIWF for $20 per adult and $10 per child (Block Island Ferry, 2017). The literature about potential and existing offshore wind projects also suggested that the anticipated impacts do not necessarily correspond with actual impacts (ICF, 2012).

### South Fork Wind Farm

The potential impacts on recreation and tourism resources from the construction and decommissioning of the SFWF will be limited to the vessel/vehicle traffic, visible structures, and lighting of these activities both onshore and offshore.

#### *Construction, Operation and Maintenance, and Decommissioning*

**Traffic**

Onshore impacts could be experienced adjacent to the ports selected for the SFWF construction, O&M, and decommissioning activities and near the O&M facility. Offshore impacts could be experienced by those recreating near the SFWF and by boaters traversing Rhode Island Sound. However, because of the relatively small area being impacted relative to the expansive surrounding waters of the Rhode Island Sound and the OCS, the construction schedule, and DWSF's commitment to implement a communication plan, which will coordinate its construction activities with potentially impacted recreational events (e.g., organized sailboat races), impacts to recreation and tourism resources in the region could be ***short-term and negligible to minor***.

**Visible Structures / Lighting**

USCG-approved navigation lighting is required for all vessels, for the OSS platform, and for WTGs during construction and O&M so that the vessels and structures are visible to other vessels. Impacts of navigational lighting on commercial shipping during O&M are considered ***long-term*** and ***negligible***. In fact, the lighting serves as a required safety feature for navigating vessels.

***Long-term, negligible impacts*** during operation of the SFWF are anticipated offshore because no navigation exclusion areas are planned for vessels and because of the relatively small area being impacted relative to the expansive surrounding waters of the Rhode Island Sound and the OCS. However, for safety, fishing activity in the SFWF will be temporarily restricted in a 1,500-foot (457.2-m) safety zone established around locations where the SFWF components will be installed (Appendix X).

Long-term potential impacts from the SFWF O&M facility onshore in either Montauk, New York or North Kingston, Rhode Island are expected to be ***negligible*** because it could be located and designed to be consistent with adjacent land uses.

### South Fork Export Cable

Potential impacts on recreation and tourism resources from the SFEC will generally be limited to construction and decommissioning and could be minimized because of the scheduling of most of the activity to avoid the peak tourist season.

***Construction, Operation and Maintenance, and Decommissioning***

**SFEC – OCS and SFEC – NYS**

**Lighting**
Impacts to recreation and tourism during construction and decommissioning of the SFEC – OCS and SFEC – NYS will relate to the lighting of these activities, which could represent a ***short-term impac***t to the offshore natural resources (e.g., altered fishing, scuba diving or sight-seeing conditions) in a localized area. Therefore, impacts could be ***short-term and negligible to minor***, with ***long-term, negligible impacts*** anticipated during O&M of the SFEC – OCS and SFEC – NYS because it will be buried unless repairs are needed.

**SFEC – Onshore**

**Traffic**
There will be a short-term increase in truck and construction equipment traffic on area routes used for the SFEC – Onshore.

**Lighting**
The lighting of these activities as well as construction of the SFEC – Interconnection Facility (Cove Hollow Road, adjacent to existing 69 kV LIPA substation) and the SFEC – NYS sea-to-shore transition vault (near the landing sites) would represent a short-term change to onshore natural resources (e.g., altered coastal beachfront as well as sight-seeing conditions) in a localized area. Therefore, there may be ***short-term, negligible*** to ***minor impacts*** on the recreation and tourism during construction and decommissioning, depending on the duration and timing of these activities with the local tourism season and location of the landing site.

The majority of the SFEC – Onshore consists of the onshore export cable which is not expected to have maintenance needs unless in need of repair because of damage from outside influences, such as unexpected digs from other parties. The SFEC – Interconnection Facility will be located adjacent to the existing LIPA substation and screened to minimize the long-term impacts from visible structures and lighting. Therefore, ***long-term impacts*** to recreation and tourism could be ***negligible***.

### 4.6.4.3 Proposed Environmental Protection Measures

Several environmental protection measures will reduce potential impacts to recreation and tourism.

- The location of the SFWF WTGs restricts available views from visually sensitive public resources and population centers.
- A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Project website, public notices to mariners and vessel float plans, and a fisheries liaison. DWSF will submit information to the USCG to issue Local Notice to Mariners during offshore installation activities.
- The communication plan will also include outreach to stakeholders in the offshore recreational and tourism industry to minimize impacts to recreational events (e.g., sailboat races).
- The SFEC - Onshore construction schedule has been designed to minimize impacts to the local community during the summer tourist season.

- New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.
- DWSF will also coordinate with local authorities during SFEC - Onshore construction to minimize local traffic and noise impacts.

## 4.6.5 Commercial and Recreational Fishing

Commercial and recreational fisheries are an integral part of the cultural history of the Southern New England region and provide a vital contribution to the economy. Several recent reports provide some key characteristics of this industry:

- In 2015, New England landings revenue totaled approximately $1.2 billion where commercial fisheries landed approximately 599 million pounds of finfish and shellfish (NOAA, 2017a). Recreational fishing, be it from shore, a private vessel, or a for-hire vessel, is also important to coastal economies and key to coastal communities' cultural heritage.
- According to a NOAA report on marine recreational bait and tackle retail stores, independent bait and tackle retail shops in coastal communities generated an estimated $854 million in total sales of marine bait, tackle, and related equipment (Hutt et al., 2015). These sales also support other top industry sectors such as service, retail and wholesale trade, and manufacturing.
- Recreational fisheries were a key economic driver in 2015 and supported 439,000 full-time or part-time jobs nationwide, supported directly or indirectly by purchases made by anglers (NOAA, 2017b). The NOAA report on the Economic Contribution of Marine Angler Expenditures (Lovell et al., 2013) states that saltwater anglers spent an estimated $4.4 billion on trip-based expenditures such as ice and fuel, and another $19 billion on durable goods and fishing equipment such as boats and fishing rods.

Species that are targeted for commercial and recreational fishing in Southern New England are managed through Fishery Management Plans (FMPs) by the New England Fishery Management Council, the Mid-Atlantic Fishery Management Council (50 CFR 600.105), the Atlantic States Marine Fisheries Commission, or some combination of these (NOAA, 2017c). Some FMPs include multiple species because they share habitat and are often fished using the same gear type. Commercial fisheries that target certain species can be grouped into broad categories by the gear used – mobile-gear, which is used while the vessel is in motion, such as trawls or dredges; and fixed-gear, which is set and retrieved later, such as lobster pots. Recreational fishing activity can be categorized by fishing mode (charter boat, party boat, private boat, or shore) and by fishing location (inland, state territorial sea [shore to 3 nm {5.5 km}], and federal Exclusive Economic Zone [more than 3 nm {5.5 km}]) (NOAA, 2017b).

Vessels hailing from New England and Mid-Atlantic states catch a diverse range of pelagic, demersal, and benthic species using various types of gear. Commercially and recreationally valuable saltwater species populations are highly dynamic, both spatially and temporally. Species shift in terms of their range and population level because fish migrate with the seasons and interannually and because of climate change, fishing, and other ecological pressures.

The information presented in this section summarizes data that is provided in detail in a technical report (Appendix Y). This assessment makes use of public data sources available at the time of publication. Multiple state and federal fisheries data resources for commercial and recreational fishing in the region were reviewed and are referenced in this section (Table 4.6-19). This regional approach to characterize fishing activity is based on data sources that were designed to

be used at a regional scale, rather than at the small spatial and physical scale of the SFWF. In addition, a regional approach recognizes that fish populations shift in physical location throughout the year and over time, and cannot be effectively summarized using a spatially and temporally narrow window.

By analyzing data from multiple sources, the fisheries most likely to be impacted by the SFWF and SFEC are specified based on the gear used, the species that are targeted, and the landing ports. Although no single dataset can illustrate the complete picture of how fisheries operate in the region, this section incorporates the best available data that is reported to state and federal resource management agencies.

DWSF is also implementing an ongoing fisheries outreach effort (Appendix B) to maintain dialogue with the regional fishing community and utilize their intimate knowledge of the resource. These efforts include one-on-one outreach with fishermen who may fish in or near the SFWF site; interviews with stakeholders who had direct experience with the BIWF, conducted by an independent, third-party; and other outreach events and activities.

**Table 4.6-19. Data Sources Used to Characterize Fisheries in the SFWF and SFEC**

| Affected Environment | Commercial Fishing Activity | Recreational Fishing Activity | Aquaculture |
|---|---|---|---|
| SFWF | Federal Vessel Trip Report (VTR) Data<br>Federal VMS Data<br>OSAMP Data<br>Stakeholder Engagement | Marine Recreational Information Program (MRIP) Data<br>OSAMP Data<br>Stakeholder Engagement | Marine Cadastre |
| SFEC - OCS and SFEC - NYS | Federal VTR Data<br>State VTR Data<br>Federal VMS Data<br>OSAMP Data<br>Stakeholder Engagement | MRIP Data<br>OSAMP Data<br>Stakeholder Engagement | Marine Cadastre<br>Suffolk County GIS Portal (Suffolk County, New York) |

Notes:
Appendix Y provides additional information about these data sources.
Marine Cadastre = MarineCadastre.gov, a BOEM/NOAA data portal

Two primary sources of information for commercial and for-hire recreational fishing activity were incorporated into this analysis. Federal VTR and Federal VMS data are the best available sources to understand which fisheries may be impacted by the SFWF and SFEC.

- The federal VTR data set has the advantage of providing a "census" of almost all fisheries that are active on the Atlantic coast, from Maine to North Carolina; however, VTRs require a single point location to represent activity that may occur over a large area at sea. On average, VTR data can provide a reasonable estimation of fishing activity, and can be examined through the landing port, the landed species, and the gear type used. The VTR data summarized in Appendix Y were first processed by NOAA, following methods described in Kirkpatrick et al. (2017), which includes the application of the statistical model as described in DePiper (2014). The data was requested for a longer and more recent period (2006 to 2015) to update information provided in Kirkpatrick et al. (2017) for fishing activity in the RI-MA WEA. In addition, data was requested for a 6.2-mile (10-km) wide SFEC fisheries study corridor inclusive of the SFEC route, which DWSF provided to NOAA for use in the analysis. This method represents a novel approach to capture additional information on activity in both the SFWF and SFEC using the most up-to-date available data.

- VMS data are also valuable because it provides precise vessel locations; however, it is processed using an imperfect method to filter data by vessel-speed to isolate fishing locations from the vessel's path of transit (DePiper, 2017, pers. comm.). As with VTR data, VMS can provide a reasonable estimation of important fishing locations, and can be examined for specific fisheries that are subject to reporting to the VMS program.

It is important to note known concerns about both VTR and VMS data. Certain fisheries are not required to report activity through the VMS and VTR programs, including lobster, shrimp, menhaden, and the harvest of non-federally-permitted species; VMS data points are also associated with only one species or group of species managed under a specific FMP, while the fishing vessel may be harvesting multiple species (Battista et al., 2013).

The fishing vessels that are required to use VMS include (50 CFR 648.10):

- Full-time or part-time limited access scallop, or limited access general category scallop permit
- Occasional limited access scallop permit when fishing under the scallop area access program
- Limited access monkfish, occasional scallop, or combination permit electing to provide VMS notifications
- Limited access multispecies permit when fishing on a category A or B day at sea
- Surfclam or ocean quahog open access permit
- Maine mahogany quahog limited access permit
- Limited access monkfish vessel electing to fish in the Offshore Fishery Program
- Limited access herring permit
- Open access herring Areas 2 and 3 permit
- Limited access mackerel permit
- Longfin squid/butterfish moratorium permit

According to the NOAA guidance on vessel reporting, all vessel operators that are permitted to fish in federal waters must submit a VTR "for every fishing trip, regardless of where the fishing occurs, or what species are targeted, with the exception of those vessels that possess only a lobster permit," (GARFO, 2018a, 2018b). In summary, most fishermen targeting scallops, monkfish, surfclam/ocean quahog, northeast multispecies; herring; mackerel; and longfin squid/butterfish are required to use VMS. other data sources (e.g., VTR, OSAMP, or stakeholder input) characterize fishing activity for those fisheries that are not required to use VMS.

In addition to VMS and VTR data, this analysis recognizes the value of other research and data products that are available, including the results of stakeholder engagement provided in the OSAMP (RICRMC, 2010) and the detailed assessment of regional VMS data completed by RI DEM (RI DEM, 2017).

Further detail about each of the data sources and their limitations can be found in the Fisheries Technical Report (Appendix Y).

#### 4.6.5.1 Affected Environment

The affected environment for commercial and recreational fishing includes a region defined by the ports with vessels that fish at or near the SFWF and SFEC because the SFWF and SFEC will

physically occupy a relatively small space in state and federal waters. This regional approach uses a representative sample of the fisheries activity in the region that may be impacted.

The affected environment is characterized based on several types of data to determine which fisheries, as defined by landing port, landed species or FMP, and gear, will be potentially impacted by the SFWF and SFWF. There is no aquaculture activity in or near the SFWF or SFEC. The process completed to determine the absence of aquaculture activity is described in further detail in the following Regional Overview section.

**Regional Overview**

Commercial and recreational fisheries are spatially and temporally dynamic because of seasonal and annual changes in the distribution of fish populations. For this reason, the regional overview (as it relates to commercial and recreational fisheries) refers broadly to the area encompassing the RI-MA WEA and the SFEC (including both the SFEC – OCS and the SFEC – NYS). The commercial and recreational fishing described here includes activity in state and federal waters, as reported to the Federal VTR program. Activity in the SFEC – NYS includes fisheries active in New York State waters spanning the Atlantic Ocean west of Montauk to East Hampton. Activity in federal waters, which may occur in or near the SFEC – OCS and the SFWF, are described for fisheries that span west to east from offshore East Hampton, New York to Martha's Vineyard, Massachusetts; and spanning from the state waters of Rhode Island to approximately 30 miles (48 km) offshore, which is approximately the southern boundary of the OSAMP study area. The regional overview is meant to reflect the interconnectivity of commercial and recreational fisheries in the area.

***Commercial Fisheries***

Commercial fisheries that are active in the SFWF and SFEC encompass a wide range of gears, species, and landing ports. Table 4.6-20 summarizes those elements that define the fisheries that may be impacted by the SFWF, based on federal fisheries data (VTR and VMS data; Appendix Y) and OSAMP data. Based on these data sources, the biggest commercial fisheries near the SFWF in terms of revenue and pounds landed include both mobile gear types (bottom trawl, mid-water trawl, scallop dredge, and clam dredge) and fixed gear types (sink gillnet, lobster and fish pots, and hand gear). As described in the OSAMP chapter on commercial fishing, the data collected in 2010 show Rhode Island commercial fishermen bottom trawl in areas south and southeast of Block Island; while scallop dredges are most active in the areas furthest offshore in the OSAMP, to the south and southwest of Block Island, and in the Cox Ledge area (Appendix Y, Figure Y-10). The mobile gear dataset collected for the OSAMP is consistent with the VTR data, indicating that bottom trawl and scallop dredge vessels fish in areas surrounding the SFEC.

**Table 4.6-20. Commercial Fisheries Most Active in the SFWF and SFEC**

| Gears | Species | Landing Port |
|---|---|---|
| Mobile Gears:<br>• Bottom trawl<br>• Mid-water trawl<br>• Scallop dredge<br>• Clam dredge | Species:<br>• Monkfish<br>• Lobster<br>• Skates<br>• Sea scallops<br>• Atlantic herring | Massachusetts<br>• New Bedford<br>• Chilmark<br>• Westport<br>Rhode Island<br>• Point Judith |

**Table 4.6-20. Commercial Fisheries Most Active in the SFWF and SFEC**

| Gears | Species | Landing Port |
|---|---|---|
| Fixed Gears:<br>• Sink gillnet<br>• Lobster pot<br>• Fish pot<br>• Hand gear | • Silver hake<br>• Little skate<br>• Flounder<br>• Longfin squid<br>• Scup<br>• Atlantic mackerel<br><br>FMP:<br>• Monkfish<br>• Sea scallops<br>• Surf clam/Ocean quahog<br>• Skates<br>• Atlantic herring<br>• Summer flounder/Scup/Black sea bass<br>• Mackerel/Squid/Butterfish<br>• Northeast Multispecies FMP | • Newport<br>• Little Compton<br>• Tiverton<br>New York<br>• Montauk<br>• Moriches<br>• Shinnecock<br>Connecticut<br>• Stonington<br>• New London |

Sources for this summary table are Federal VTR and VMS data, and the OSAMP report.

Among fixed gear, the biggest commercial fisheries (in terms of revenue and pounds landed) in the SFWF and SFEC include sink gillnet, lobster pot, and hand gear (Appendix Y, Table Y-1). The fixed gear fishing location data collected for the OSAMP are also in agreement with the VTR data, and indicate areas considered important by Rhode Island commercial fishermen who use lobster pots, fish pots, and gill nets. The OSAMP only included input from Rhode Island commercial fishermen; however, fishermen from New York, Connecticut, and Massachusetts who use the same gear may also consider these same areas to be important. A large portion of Rhode Island Sound, including Cox Ledge and Southwest Shoal, is fished with fixed gear (Appendix Y, Figure Y-11); in addition, there is fixed gear fishing activity indicated in Block Channel, which is crossed by the SFEC – OCS. These fixed gear fishing areas were highlighted by the Rhode Island fishermen who contributed to the OSAMP; fishermen from New York, Connecticut, and Massachusetts using fixed gear may also consider those areas important. VTR data indicate that sink gillnet and lobster pot gears are among the top five gears used (in terms of average annual revenue) for fishing reported within the broad SFEC fisheries study corridor surrounding the SFEC – NYS and SFEC – OCS used for this analysis (Appendix Y, Table Y-6). In addition, of those vessels with only New York State permits, fishermen using gill nets landed the greatest proportion of pounds caught in New York State waters that are crossed by the SFEC – NYS (Appendix Y-Table Y-11).

The fisheries that may be impacted by the SFWF and SFEC are those targeting monkfish; sea scallops; surf clam/ocean quahog; skates; Atlantic herring; summer flounder/scup/black sea bass; northeast multispecies; and mackerel/squid/butterfish FMPs. In addition, fisheries for other species that may be impacted by the SFWF and SFEC include lobster, skates, silver hake, and Atlantic mackerel. A complete list of species and additional detail on estimated revenue and

landings of species and FMPs that are caught within the SFWF and SFEC is provided in Appendix Y, Tables Y-2, Y-3, Y-7 and Y-8. The ports where catch from the SFWF and SFEC are frequently landed include the Massachusetts ports of New Bedford, Chilmark, and Westport; the Rhode Island ports of Point Judith, Newport, Little Compton, and Tiverton; the New York ports of Montauk, Moriches, and Shinnecock; and the Connecticut ports of Stonington and New London. Most fishing activity is conducted by vessels hailing from ports in Massachusetts, Rhode Island, Connecticut, and New York; there are also some vessels that fish in the RI-MA WEA from New Jersey, Virginia, and North Carolina (Appendix Y, Tables Y-4, Y-5, Y-9, and Y-10). Commercial fisheries in New York State waters also include hook-and-line gear. Additional detail on species caught in New York State waters is provided in Appendix Y, Table Y-12.

Fishing occurs throughout the SFEC and SFWF area, and variation in intensity of fishing activity by location is challenging to accurately and precisely categorize with available data sources. VMS data for several commercial fisheries indicate respective levels of intensity of vessel traffic and fishing activity in the SFWF and SFEC. The available data suggest that most fisheries do not have high relative fishing intensity within the RI-MA WEA compared with nearby waters (Appendix Y, Figures Y-3 through Y-9). The fisheries with the greatest intensity of activity within the RI-MA WEA is from vessels targeting monkfish and groundfish. Vessels targeting monkfish have very high and high relative fishing intensity just south of the RI-MA WEA and medium-high to high relative fishing intensity within the SFWF MWA. Vessels targeting groundfish had some activity within the RI-MA WEA, including medium-low and low relative fishing intensity within the SFWF MWA. Generally, groundfish vessels were much more active to the south and west of the RI-MA WEA. The VMS data suggest multiple fisheries are active near the SFEC – OCS and SFEC – NYS. The SFEC - OCS crosses an area of relatively high-intensity of groundfish fishing, very high intensity of monkfish fishing, and high intensity of scallop fishing. In the nearshore New York State waters, the VMS data indicate there was relatively high intensity of fishing for squid in the area crossed by the SFEC – NYS.

### *Recreational Fisheries*

Recreational fisheries in the SFWF and SFEC target a wide range of pelagic, highly migratory, and demersal species (Table 4.6-21). A comprehensive list of species that are targeted within the OSAMP area was developed through an iterative process, using catch data, and correspondence with recreational charter boat captains (RICRMC, 2010). MRIP data on the relative seasonal intensity of recreational angler trips are presented in Appendix Y, Figure Y-13. These data indicate the peak activity for angler trips out of New England and Mid-Atlantic states for all fishing locations, particularly in federal waters, occur from May through October (NOAA, 2017d).

**Table 4.6-21. Common Species Targeted in Recreational Fisheries in the SFWF and SFEC**

| Common Name | Scientific Name |
|---|---|
| Atlantic bonito | *Sarda sarda* |
| Atlantic cod | *Gadus morhua* |
| Black sea bass | *Centropristis striata* |
| Bluefish | *Pomatomus saltatrix* |
| False albacore | *Euthynnus alletteratus* |

**Table 4.6-21. Common Species Targeted in Recreational Fisheries in the SFWF and SFEC**

| Common Name | Scientific Name |
|---|---|
| Pollock | *Pollachus virens* |
| Scup | *Stenotomus chrysops* |
| Shortfin mako | *Isurus oxyrinchus* |
| Blue shark | *Prionace glauca* |
| Thresher shark | *Alopias vulpinus* |
| Striped bass | *Morone saxatilis* |
| Summer flounder | *Paralichthys dentatus* |
| Tautog | *Tautoga onitis* |
| Bluefin tuna | *Thunnus thynnus* |
| Yellowfin tuna | *Thunnus albacares* |
| Winter flounder | *Pseudopleuronectes americanus* |

Note:

This list was developed based on the OSAMP documentation of recreational fisheries, which used information collected from representatives of the Rhode Island-based recreational fishing industry. While these species are commonly targeted for recreational fishing, this is not an exhaustive list of recreational species in the region.

There are few data sources available that describe recreational fishing activity. MRIP data are used to summarize recreational angler-trips from surrounding states; however, this dataset does not include fishing locations, so it may be used only to characterize the relative intensity of fishing activity among states and over time. Information on fishing location data from the OSAMP is also used for additional context; this information was provided by for-hire recreational fishermen for inclusion in the OSAMP (Appendix Y). To characterize recreational fishing activity in the SFWF and SFEC, the number of angler trips leaving from the four surrounding states: New York, Connecticut, Rhode Island, and Massachusetts (Appendix Y, Table Y-14), is summarized using the last 5 years of available recreational angler-trip data (2012 to 2016). Intercept-surveys with fishing-area data missing were recorded as fishing in "unknown" locations, but provide information as to whether the trip is on a charter or private vessel. Over this 5-year period, the greatest number of angler-trips to federal waters left from New York, with an average of more than 197,000 estimated trips per year (Appendix Y, Table Y-14). In terms of the percent of total angler trips at the state level, most trips leaving from each of the four states were in private vessels (Appendix Y, Table Y-15). New York has the greatest proportion of charter-boat angler trips among the four states (11 percent of all angler-trips out of New York State), and Rhode Island has the greatest proportion of shore-based angler trips among the four states (50 percent of all Rhode Island angler-trips). Data collected by the RICRMC for the OSAMP included spatial data provided by for-hire recreational fishermen from Rhode Island, who noted on a map the locations of particular value to their industry. In Appendix Y, Figure Y-12, the SFWF and SFEC is mapped with the recreational fishing locations data. The map indicates that recreational fishing occurs in the SFWF, and that some recreational fishing occurs near the eastern portion of the SFEC - OCS.

### *Aquaculture*

There are no active aquaculture lease areas or operations in federal waters in the SFWF turbine array area, or in the SFEC - OCS, as of spring 2018. There are also no active aquaculture lease areas or operations in the SFEC - NYS or SFEC – Onshore. This was determined through a careful examination of the available aquaculture data on the Marine Cadastre spatial data portal (BOEM and NOAA, 2017) and the Suffolk County, New York GIS Portal's Shellfish Aquaculture Lease Program (Suffolk County GIS Portal, 2017). Furthermore, staff at the NYSDEC confirmed the absence of aquaculture activities on the south shore of the South Fork of Long Island, New York (Carden, 2017, pers. comm.).

Although there are no current aquaculture activities within the SFWF or SFEC, the company Manna Fish Farms is in a permitting process to install finfish grow-out pods to be located 16.2 nm (30 km) south off the coast of Hampton Bays, New York, on the South Fork of Long Island, per a May 2016 article (Fish Farmer, 2016). The farm planned to "install a pod array off the coast of Eastern Long Island to moor up to two dozen mesh-enclosed galvanized steel geodesic 'Aquapods' in the Atlantic Ocean," which would host striped bass, raised from fingerling-size juveniles (Ryan, 2015). The SFEC – OCS is approximately 15 miles (24 km) to the east-northeast of where this activity is proposed.

## South Fork Wind Farm

### *Commercial Fisheries*

The following section utilizes two sources of information on commercial fisheries that are active in the RI-MA WEA: VTR data as provided by NOAA for the years 2006 through 2015; and the results of an analysis of commercial fisheries data for the years 2011 through 2016, as reported by the RI DEM (RI DEM, 2017). The analysis reported in RI DEM (2017) is based on federal landings revenue data linked to VMS fishing locations and directly connects revenue to fishing location as reported by VMS. In contrast, the NOAA VTR data summarized in Appendix Y are modelled revenue-estimates for fishing activity. The revenue and landings estimates provided by these reports cannot be accurately divided proportionally over the footprint of a smaller area due to the way the data were analyzed. For context, it is important to consider that the area of the SFWF Project envelope (approximately 36.3 $km^2$) compared to the entire RI-MA WEA (approximately 97,498 acres or 394.6 $km^2$). The SFWF has a footprint of approximately 9 percent of the total area of the RI-MA WEA, but fishing revenues within the SFWF Project envelope may not represent 9 percent of the total fishing revenue of the RI-MA WEA. This section does not provide the exact dollar amounts estimated by this analysis, because those values are valuable as estimates of relative intensity of fishing activities, but cannot be used to assess the exact amount of revenue and pounds that should be expected from fishing in the SFWF. The complete results of the VTR data analysis provided by NOAA (with confidential information redacted) are provided in Appendix Y.

The fisheries likely to be impacted by the SFWF, as characterized by gear type, species/FMP, and fishing ports, are described in the following sections and summarized in Table 4.6-22. The potential impacts of the SFWF on the impacted fisheries, including both negative and potential beneficial impacts, are discussed in detail in Section 4.6.5.2. The greatest landings revenue from fishing in the RI-MA WEA were generated by otter bottom trawl, sink gillnet, and scallop dredge gear (RI DEM, 2017). For the results of the VTR analysis in the RI-MA WEA by gear type, see Appendix Y, Table Y-1. Commercial fishermen have also reported to DWSF that while gillnetting does occur in the SFWF area, there is limited use of mobile gear because of the presence of boulders and hazards that can destroy gear.

According to VMS data, the FMPs that earned the most landings revenue from fishing in the RI-MA WEA during 2011 through 2016 include sea scallops, monkfish, and Northeast multispecies (RI DEM, 2017). In addition, NOAA VTR data indicate that the top species by landings revenue were monkfish, lobster, skates, sea scallops, and surf clam/ocean quahog for the years 2006 through 2015. For the results of the VTR analysis in the RI-MA WEA by species and FMP, see Appendix Y, Table Y-2 and Table Y-3, respectively.

As characterized by the NOAA VTR data, the Massachusetts ports that earned the greatest revenue on average each year from fishing in the RI-MA WEA include Westport, Harwich Port, and New Bedford. The ports Westport and Chilmark caught a larger proportion of their total average annual landings revenue from within the RI-MA WEA. The Rhode Island ports that earned the greatest revenue on average each year for that period from fishing in the RI-MA WEA include Little Compton, Newport, and Point Judith. A larger proportion of the total average annual revenue for landings in Little Compton, Rhode Island came from fishing in the RI-MA WEA. Among New York ports, the VTR data indicates that Montauk had the greatest landings revenue on average for fish caught within the RI-MA WEA from 2006 to 2015. It is likely that fishermen from several other New York ports also fished in the RI-MA WEA during that period; however, because of confidentiality concerns, their activity could not be provided by NOAA. Fishermen that were active during this period near the SFEC may also fish in the RI-MA WEA; those ports are listed in Appendix Y, Table Y-9. For the full results of the VTR analysis in the RI-MA WEA by port, see Appendix Y, Table Y-4 and Table Y-5.

According to the VMS data as analyzed in RI DEM (2017), over the years 2011 to 2016, New Bedford, Massachusetts earned a total of $2.9 million in revenue, with the greatest landings in the year 2014 (more than $969,000). For the same set of years, Point Judith, Rhode Island earned more than $2 million total in revenue, with the greatest earnings in 2013 (more than $594,000).

**Table 4.6-22. Commercial Fisheries Most Active in the SFWF Area**

| Gears | Species | Landing Port |
|---|---|---|
| • Bottom trawl<br>• Gillnet<br>• Lobster pot<br>• Scallop dredge | Species:<br>• Monkfish<br>• Lobster<br>• Skates<br>• Sea scallop<br>• Surfclam/ocean quahog<br>FMP:<br>• Monkfish<br>• Sea scallop<br>• Surfclam/ocean quahog<br>• Skates<br>• Northeast Multispecies FMP | Massachusetts<br>• New Bedford<br>• Chilmark<br>• Harwich Port<br>• Westport<br>Rhode Island<br>• Point Judith<br>• Newport<br>• Little Compton<br>New York<br>• Montauk |

Sources for this summary table are Federal VTR and VMS data, and the OSAMP report.

VMS data overlaid with the SFWF provide additional information for specific fisheries that are active in that facility area (Appendix Y, Figures Y-3 through Y-9). A qualitative summary of the fishing effort and intensity near the SFWF is provided in Table 4.6-23. Additional detail on

fishing activity as characterized by VTR data provided by NOAA is included in Appendix Y (Gears: Table Y-1; Species/FMP: Table Y-2; Ports: Table Y-3). For further detail on fishing activity as characterized by VMS data and reported by RI DEM, see RI DEM (2017).

**Table 4.6-23. Characteristics of Fishing Intensity and Occurrence in the SFWF for Fishery Management Plans based on VMS Data**

| Fishery | Year(s) of Data | Relative Intensity | Occurrence |
|---|---|---|---|
| Groundfish | 2011-2014 | Medium-High to Low | Widespread |
| Monkfish | 2011-2014 | High to Medium-Low | Widespread |
| Pelagics (Herring/Mackerel/Squid) | 2015-2016 | Medium-Low to Low | Scattered |
| Herring | 2011-2014 | None | Absent |
| Scallop | 2011-2014 | Medium-High to Low | Scattered |
| Surfclam/Ocean Quahog | 2012-2014 | None | Absent |
| Squid | 2014 | None | Absent |

Source: *Qualitative assessment of Federal VMS data* (GARFO, 2018), acquired from the Northeast Ocean Data Portal (2018).

### *Recreational Fisheries*

Recreational fishing trips (private, charter, or shoreside trips) peak during the months of May through October (Appendix Y, Figure Y-13). The recreational trips departing from Massachusetts, Rhode Island, or New York to federal waters on private or charter vessels are within a reasonable travel distance for a fishing trip, to the SFWF[6]; MRIP data indicate that the greatest number of trips to federal waters by either charter or private vessels departed from Massachusetts or New York during 2012 to 2016. Information provided by fishermen contributing to the OSAMP also indicates that the SFWF is located within a large area that is known to be used by some recreational charter boat fishermen.

## SFEC – OCS

### *Commercial Fisheries*

Commercial fisheries near the SFEC – OCS area are broadly characterized in the introductory Regional Overview section. This section focuses on fisheries in the specific footprint of the SFEC – OCS (Appendix Y, Figure Y-1; Table 4.6-24).

The fisheries that are identified as active in the SFEC – OCS by VTR data are summarized by gear, species/FMP, and landing port in Table 4.6-24. The potential impacts of these components on the most impacted fisheries noted here, both negative and beneficial, are discussed in detail in Section 4.6.5.2. The VTR data summary for fishing activity in the SFEC fisheries study corridor was used to assess which fisheries are active near the SFEC; and; revenue values are used to highlight the fisheries that are likely to be the most active near the SFEC.

VTR data for the SFEC fisheries study corridor indicate that the most active gears include bottom trawl, scallop dredge, sink gillnet, clam dredge, and lobster pot (Appendix Y, Table Y-6).

[6] To characterize ports that may be exposed to the development of offshore WEAs, Kirkpatrick et al. (2017) used the distance of 30 nm (48 km) as a cut-off for those ports that could be exposed to WEAs because 30 nm (48 km) is a about as far as a charter boat might travel to do offshore fishing.

These results are further supported by the OSAMP spatial data (Appendix Y, Y-10, and Y-11). Commercial fishermen have reported to DWSF that there is both gillnetting and scalloping activity west of the SFWF near the SFEC - OCS; in addition, scalloping activity along the SFEC - OCS area intensifies further west of the SFWF, as there is a decrease in boulders that can snag the gear.

Within the SFEC fisheries study corridor, the fisheries with the estimated greatest landings revenue on average each year for 2006 through 2015 were from FMPs of sea scallop, monkfish, surf clam/ocean quahog, summer flounder/scup/black sea bass, Atlantic herring, skate, and squid/mackerel/butterfish. For the full results of the VTR analysis in the SFEC fisheries study corridor by port, see Appendix Y, Table Y-8. When considered in terms of individual species, the greatest revenue on average from fish caught in the SFEC fisheries study corridor during that period include the species grouped in FMPs, as well as skates and inshore longfin squid. In terms of pounds-landed, on average for 2006 to 2015, the FMPs with the greatest landings from the SFEC fisheries study corridor included herring, skates, and monkfish. In terms of pounds-landed for individual species, the largest fisheries on average each year included the abovementioned species, as well as scup and Atlantic mackerel. For the full results of the VTR analysis of fishing in the SFEC fisheries study corridor by species, see Appendix Y, Table Y-7.

According to the NOAA VTR data, the ports with the greatest revenue for landings sourced from within the SFEC fisheries study corridor include Point Judith, Rhode Island; Montauk, New York; and New Bedford, Massachusetts. In addition, the ports of Stonington and New London, Connecticut; Shinnecock, New York; and Newport, Tiverton, Little Compton, and Davisville, Rhode Island were also active near the during that period in the SFEC fisheries study corridor. For the full results of the VTR analysis of fishing in the SFEC fisheries study corridor by port, see Appendix Y, Table Y-9.

**Table 4.6-24. Commercial Fisheries Most Active in the SFEC - OCS**

| Gears | Species/FMP | Landing Port |
|---|---|---|
| • Bottom trawl<br>• Scallop dredge<br>• Clam dredge<br>• Sink gillnet<br>• Lobsterpot | Species:<br>• Monkfish<br>• Sea scallop<br>• Flounder<br>• Squid<br>• Skates<br>FMP:<br>• Monkfish<br>• Sea scallop<br>• Surfclam/ocean quahog<br>• Summer flounder/scup/black sea bass<br>• Atlantic Herring<br>• Squid Mackerel Butterfish | Massachusetts<br>• New Bedford<br>Rhode Island<br>• Point Judith<br>New York<br>• Montauk |

Sources for this summary table are Federal VTR and VMS data, and the OSAMP report.

VMS data, overlaid with the SFEC – OCS, provide additional information for specific fisheries that are active in this area (Appendix Y, Figures Y-3 through Y-9). A qualitative summary of fishing effort and intensity near the SFEC – OCS is summarized in Table 4.6-25.

**Table 4.6-25. Characteristics of Fishing Intensity and Occurrence near the SFEC - OCS for Fishery Management Plans based on VMS Data**

| Fishery | Years of Data | Relative Intensity | Occurrence |
|---|---|---|---|
| Groundfish | 2011-2014 | High to Medium-Low | Widespread |
| Monkfish | 2011-2014 | Very High to Medium-High | Widespread |
| Pelagics (Herring/Mackerel/Squid) | 2015-2016 | Very High to Medium-High | Widespread |
| Herring | 2011-2014 | Medium-High to Low | Widespread |
| Scallop | 2011-2014 | High to Medium-Low | Widespread |
| Surfclam/ocean quahog | 2012-2014 | High to Low | Widespread |
| Squid | 2014 | High to Medium-Low | Scattered |

Source: *Qualitative assessment of Federal VMS data* (GARFO, 2018b), acquired from the *Northeast Ocean Data Portal* (2018).

### *Recreational Fisheries*

The recreational fishing activity that may be impacted by the SFEC – OCS will be the same as that described for the SFWF. Additional information provided by fishermen to the OSAMP also suggests that the SFEC – OCS overlaps with some areas used by recreational charter boat fishermen.

## SFEC – NYS

### *Commercial Fisheries*

The fisheries that are identified as active in state waters near the SFEC – NYS by NYSDEC VTR data are summarized by gear, species/FMP, and landing port in Table 4.6-26. Fishing locations for commercial vessels that fish *only* in New York State waters are reported to the New York State statistical areas on VTRs; given the fact that confidential information has been redacted for information on fishing by fewer than three individuals, smaller fisheries by revenue and landings value may not be clearly indicated by the values presented in Appendix Y. Fishing activity by vessels that fish in both state and federal waters near the SFEC are described by the Federal VTR data in Appendix Y, Tables Y-6 through Y-10. The SFEC – NYS and potential landing sites transit through two statistical areas. If activity is reported in both statistical areas, the pounds landed from fishing in those areas are separated out (Appendix Y, Figure Y-2). NYSDEC VTR data indicate that the largest fisheries in terms of pounds landed during 2007 through 2016 used gillnets, hook-and-line, dredge, otter trawl, and pots/traps gear. For the full results of the VTR analysis of fishing in New York State waters, see Appendix Y, Table Y-11. Commercial fishermen have reported to DWSF that there is a substantial trawling activity in state waters between East Hampton and Montauk, New York. This fishery has a brief (2-month), intense, and very important squid fishing season; fishermen in this area also target mackerel and groundfish.

The top commercial species in terms of pounds landed in these two statistical areas include striped bass, longfin squid, skates, bluefish, American lobster, and monkfish (Appendix Y, Table Y-12). The ports of Moriches, Shinnecock, and Montauk were the largest landing ports for fishing activity in New York State waters in terms of pounds landed on average each year during 2007 through 2016 (Appendix Y, Table Y-13).

**Table 4.6-26. Commercial Fisheries Active in the SFEC – NYS as Identified by NYSDEC VTR Data**

| Gears | Species | Landing Port |
|---|---|---|
| • Gillnet<br>• Hook-and-line<br>• Dredge<br>• Otter trawls<br>• Pots/traps | Species:<br>• Striped bass<br>• Longfin squid<br>• Skates<br>• Bluefish<br>• American lobster<br>• Monkfish | New York<br>• Moriches<br>• Shinnecock<br>• Montauk |

Note: This information represents fishing activity as reported by fishermen to NYSDEC from 2007 to 2016, as indicated by data provided by the Atlantic Coastal Cooperative Statistics Program (ACCSP; 2017), which is for fishermen who only hold New York state fishing permits; it does not include fishing activity by fishermen who hold both state and federal fishing permits. Gears include those that landed over 10,000 pounds on average each year from 2007 to 2016.

VMS data, overlaid with the SFEC - NYS, provide additional information for specific fisheries that are active in this area (Appendix Y, Figures Y-3 through Y-9). A qualitative summary of fishing effort and intensity near the SFEC - NYS is summarized in Table 4.6-27.

**Table 4.6-27. Characteristics of Fishing Intensity and Occurrence near the SFEC – NYS for Fishery Management Plans based on VMS Data**

| Fishery | Years of Data | Relative Intensity | Occurrence |
|---|---|---|---|
| Groundfish | 2011-2014 | High to Low | Widespread |
| Monkfish | 2011-2014 | Medium-Low to Absent | Scattered |
| Pelagics (Herring/Mackerel/Squid) | 2015-2016 | Very High | Widespread |
| Herring | 2011-2014 | Medium-Low to Absent | Scattered |
| Scallop | 2011-2014 | Medium-Low to Low | Widespread |
| Surfclam/ocean quahog | 2012-2014 | Low | Scattered |
| Squid | 2014 | High to Medium-Low | Widespread |

Source: *Qualitative assessment of Federal VMS data* (GARFO, 2018b), acquired from the *Northeast Ocean Data Portal (2018).*

### *Recreational Fisheries*

Most of New York's recreational fishing effort is estimated to occur from shore (Appendix Y, Figure Y-1) during summer months (May through September). Shore fishing also occurs during the shoulder months of March/April and November/December when there is limited fishing effort by private or for-hire vessels in either state or federal waters. The MRIP data estimate that approximately 3.6 million trips in New York State waters occurred on average each year from 2012 through 2016. These trips include angler-trips on private boats in state waters (49 percent),

and shore-based trips (41 percent) (Appendix Y, Tables Y-14 and Y-15). Estimates for angler-effort disaggregated to the county level indicate that approximately 132,000 angler-trips are taken to federal waters each year out of Suffolk County, compared to approximately 2.5 million trips to state waters (Appendix Y, Table Y-16). Approximately 65 percent of all recreational fishing trips that left from New York State are estimated to have departed from Suffolk County each year on average for the years 2012 through 2016.

### 4.6.5.2 Potential Impacts

Construction, O&M, and decommissioning activities associated with the SFWF have the potential to cause both direct and indirect impacts on commercial and recreational fisheries. An overview of IPFs of these activities that may impact fisheries is illustrated on Figure 4.6-5. IPFs associated with the construction, O&M, and decommissioning phases for the SFWF and SFEC are described in Section 4.1.

Direct impacts are characterized as those caused specifically by the IPFs associated with the Project phases, as described in Section 4.1. Indirect impacts on fishing activity will be those impacts caused by IPFs on benthic resources, shellfish, and finfish species that are targeted by commercial and recreational fisheries. The SFWF and SFEC are not expected to have major long-term impacts on commercial and recreational fisheries (Section 4.3.2 and Section 4.3.3). The following sections are separated into the SFWF and the SFEC, including the SFWF turbine array, the SFEC – OCS, and the SFEC – NYS.

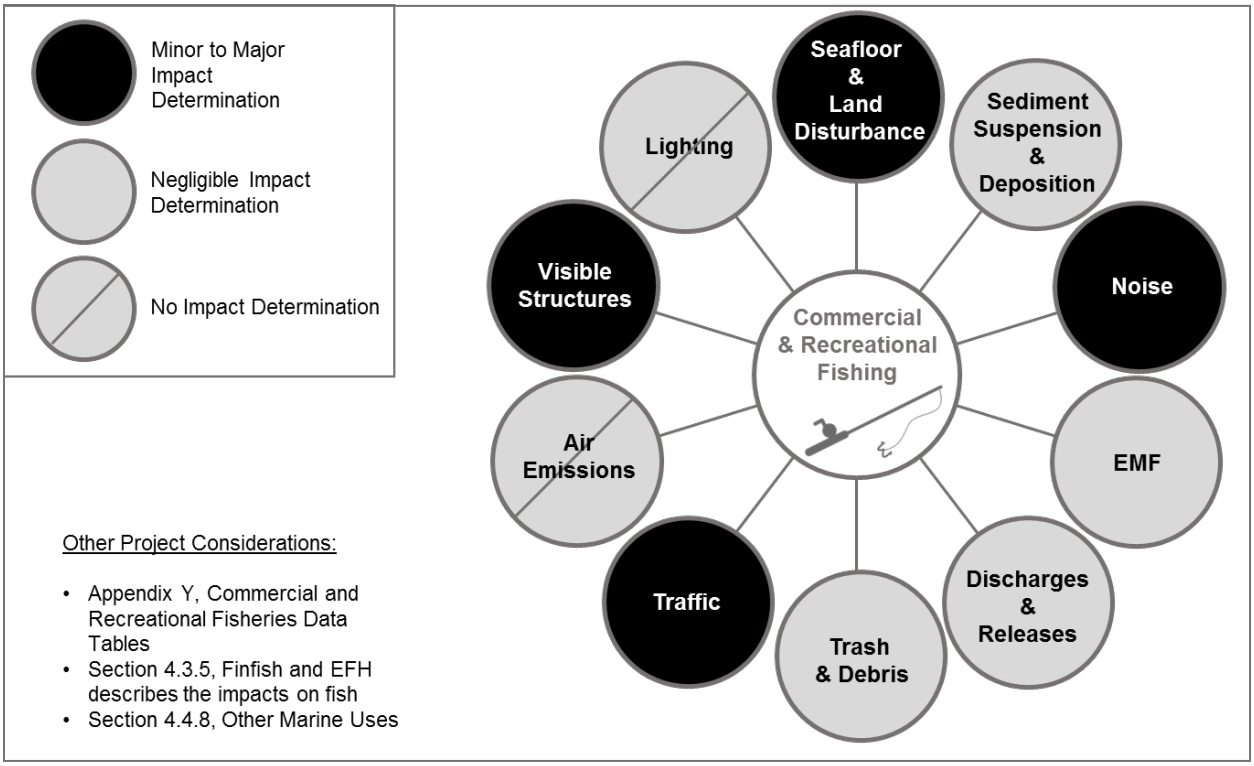



**Figure 4.6-5. Impact-producing Factors on Commercial and Recreational Fisheries**

#### South Fork Wind Farm

Table 4.6-28 summarizes the level of impacts expected to occur to commercial and recreational fisheries during the construction and decommissioning phases of the SFWF. Table 4.6-29 summarizes the level of impacts expected to occur during the O&M phase of the SFWF.

Construction and decommissioning activities are generally expected to have ***short-term, minor impacts*** on access to fishing activity because of an expected 500-yard safety zone established around locations where the SFWF components will be installed (Appendix X), and because of habitat modification that would impact some commercially and recreationally targeted species. O&M activities are expected to have ***long-term, minor*** to ***moderate impacts*** on certain commercial fisheries due to displacement of fishing activity and may have ***minor, beneficial impacts*** on recreational fisheries. As noted in Section 4.1.9, the Visible Structures IPF addresses components that will occupy space underwater, above water, and on land. Additional details on potential impacts to commercial and recreational fisheries from the various IPFs at the SFWF are described in the following sections.

**Table 4.6-28. IPFs and Potential Levels of Impact on Commercial and Recreational Fisheries at the SFWF during Construction and Decommissioning**

| IPF | Potential Impact | Maximum Level of Impacts |
|---|---|---|
| Seafloor & Land Disturbance | Seafloor Preparation | Minor, short-term, direct<br>Moderate, short-term, indirect |
| | Pile Driving/Foundation Installation | Minor, short-term, direct<br>Minor, short-term, indirect |
| | OSS Platform Installation | Minor, short-term, direct<br>Minor, short-term, indirect |
| | SFWF Inter-Array Cable Installation | Minor, short-term, direct<br>Minor, short-term, indirect |
| | Vessel Anchoring (including spuds) | Minor, short-term, direct<br>Minor, short-term, indirect |
| Noise | Pile Driving | Minor, short-term, indirect |
| | Ship, Trenching, Aircraft Noise | Minor, short-term, indirect |
| Traffic | | Minor, short-term, direct |
| Visible Structures | | Minor, short-term, direct |
| Sediment Suspension & Deposition | | Minor, short-term, indirect |
| Discharges [a] | | Negligible |
| Trash &Debris [a] | | Negligible |

* Supporting information on the negligible level of impact from the discharges and trash and debris IPFs is provided in Section 4.1.

**Table 4.6-29. IPFs and Potential Levels of Impact on Commercial and Recreational Fisheries at the SFWF during Operations and Maintenance**

| IPF | Potential Impact | Maximum Level of Impact |
|---|---|---|
| Seafloor and Land Disturbance | WTG Foundations | Moderate, long-term, direct<br>Minor, long-term, indirect |
| | OSS Platform | Moderate, long-term, direct<br>Minor, long-term, indirect |
| | SFWF Inter-Array Cable | Moderate, long-term, direct (negative)<br>Minor, long-term, indirect (beneficial) |
| | Vessel Anchoring (including spuds) | Minor, short-term, direct<br>Minor, short-term, indirect |
| Noise | Ship and Aircraft Noise | Minor, short-term, indirect |
| | WTG Operational Noise | Minor, short-term, indirect |
| Traffic | | Negligible, long-term, direct |
| Visible Structures | | Minor, long-term, direct |
| Electromagnetic Fields (EMF) | | Negligible |
| Sediment Suspension and Deposition | | Negligible |
| Discharges * | | Negligible |
| Trash and Debris * | | Negligible |

* Supporting information on the negligible level of impact from the discharges and trash/debris IPFs is provided in Section 4.1.

### *Construction*

**Seafloor Disturbance**

IPFs associated with seafloor disturbance include seafloor preparation, pile driving and foundation installation, OSS platform installation, SFWF inter-array cable installation, and vessel anchoring (including spuds). Section 4.1 describes the expected impact areas associated with each foundation type that may be used to support the WTGs and OSS, and the impact area associated with the inter-array cable.

In general, seafloor disturbance is expected to produce negligible to minor levels of direct and indirect impacts to species, depending on the mobility of the species present. This will result in ***short-term*** and ***long-term, negligible*** to ***minor levels of indirect impacts*** to commercial and recreational fisheries that target the directly impacted species. Seafloor disturbance during construction is expected to result in ***minor, short-term, direct impacts*** on all commercial and recreational fisheries due to the short-term disruption of access to fishing areas for safety. Additional indirect impacts to commercial and recreational fisheries from seafloor disturbance are described in the following paragraphs.

**Seafloor Preparation**
Impacts due to seafloor preparation on benthic species with limited mobility are expected because they may not be able to move out of the way during impact-producing activities and will be subject to injury or mortality. Thus ***minor, short-term, indirect impacts*** are expected for fisheries that target more mobile species (such as American lobster, monkfish, skates, and squid), which are likely to temporarily vacate the area but may be subject to limited injury or mortality. These species are likely to return to the area after the construction phase. ***Minor, short-term, indirect impacts*** are expected for commercial fisheries that target less-mobile species (such as sea scallops and surf clams). For more information about shellfish resources in the SFWF, see Section 4.3.2.

**Pile Driving and Foundation Installation**
Placement of the foundations, piles, and/or associated scour protection (if necessary) will result in minor, short-term, direct impacts for those species that have preferred habitat in the SFWF (Tables 4.3-3 and 4.3-10) following the disturbance. Fisheries that target species present in the SFWF as listed in Table 4.3-4 and Table 4.3-9, and are commercially or recreationally important, may experience ***minor, short-term, indirect impacts.***

**SFWF Inter-Array Cable Installation**
SFWF inter-array cable installation may cause short-term, minor, impacts on benthic and demersal species because of habitat modification, as described for Seafloor Preparation. This may have ***minor, short-term, indirect impacts*** on commercial and recreational fisheries that target these species.

**Vessel Anchoring and Spuds**
Vessel anchoring and spuds will have minor, short-term, direct impacts to benthic habitat due to modification and disturbance of the seabed. However, it is expected to rapidly recover (Guarinello et al., 2017). For this reason, vessel anchoring may result in ***minor, indirect, short-term impacts*** on commercial and recreational fisheries that target benthic and demersal species in the area because of short-term displacement of some species and habitat disturbance.

**Sediment Suspension and Deposition**
Sediment suspension and deposition impacts in the SFWF during construction are likely to result in minor, short-term, direct impacts for those species that have preferred habitat in the SFWF (Tables 4.3-3 and 4.3-10), which could result in ***short-term, negligible, indirect impacts*** to commercial fisheries that target the directly impacted species.

**Noise**
Commercial and recreational fisheries are unlikely to experience direct impacts of noise during construction because fishing activity will be temporarily restricted in the immediate area of the installation operations due to a short-term 500-yard (457 m) safety zone established around locations where the SFWF components will be installed (Appendix X). Therefore, noise impacts are considered in-terms of the potential impacts on benthic and demersal species that are targeted by commercial and recreational fisheries. There may be ***minor, short-term, indirect impacts*** to fisheries targeting the more mobile species in the vicinity of the SFWF because species exposure to underwater noise exhibit short-term behavioral changes – including area avoidance. The commercial and recreational fisheries that may be impacted are those targeting more mobile species, such as Atlantic cod, black sea bass, scup, tautog, monkfish, lobster, and skate. Further information about underwater noise impacts on benthic and demersal species may be found in Sections 4.3.2 and 4.3.3.

**Traffic**
Commercial and recreational fisheries may experience ***minor, short-term, direct impacts*** due to increased vessel traffic during the construction phases of the SFWF. For safety, fishing activity in the SFWF will be temporarily restricted in the established 500-yard (457 m) safety zone (Appendix X).

**Visible Structures**
The physical presence of installation vessels will have a ***minor, short-term, direct impact*** on fishing activity, because there will be a minimum safety perimeter around installation vessels that is established during construction activity.

***Operations and Maintenance***

**Seafloor Disturbance**
IPFs associated with seafloor disturbance during O&M of the SFWF has been split into foundation, OSS platform, SFWF inter-array cable, and vessel anchoring (including spuds). See Section 4.1 for the expected impact areas associated with each foundation type that may be used to support the WTGs and OSS, and the impact area associated with the inter-array cable. In general, seafloor disturbance is expected to produce negligible to moderate levels of direct and indirect impacts to species, depending on the mobility of the species. Additional indirect impacts to commercial and recreational fisheries from seafloor disturbance are described in the following paragraphs.

**Foundations**
The presence of the foundations and associated scour protection (if necessary) will result in ***moderate, long-term, indirect*** impacts to benthic and demersal organisms because of the conversion of existing sand or sand with mobile gravel habitat to hard bottom. This conversion to hard bottom habitat may trigger an impact known as a "reef effect" which could result in adverse and beneficial impacts depending on the species. For further information on common habitat types by species, see Tables 4.3-3 and 4.3-10, and for further information on expected impacts to benthic and demersal finfish species, see Section 4.3.3.2. Commercial fisheries that target species with limited mobility may have ***minor, long-term, indirect impacts*** from the presence of the WTG foundations (due to the impact on benthic and demersal species such as ocean quahog clam, Atlantic surfclam, Atlantic sea scallop, and American lobster). ***Minor*** to ***moderate, long-term, direct impacts*** may occur for commercial fishermen using mobile, bottom-tending gear (such as bottom trawl or scallop dredge), that choose not to fish near the WTG foundations. While fishing will not be possible in the exact locations of the WTG foundations, fishermen using either fixed or mobile gear types will be able to fish in surrounding areas.

Recreational fisheries generally do not target benthic invertebrate species in offshore areas. Finfish species are more mobile and are likely to recolonize areas after the conclusion of the installation phase. For these reasons, there are no direct negative impacts expected for recreational fishing in the short- or long-term. Because of the modification of bottom habitat, there may be ***long-term, indirect benefits*** on recreational and commercial fisheries from the reef effect described in Section 4.3.2.1 and may eventually attract recreationally and commercially targeted finfish and invertebrates such as the American lobster.

A ***long-term, minor, indirect, benefit*** of the WTGs' physical presence is that hardened structure will likely attract recreationally important species. The physical presence would likely cause the direct, minor impacts on recreational fisheries due to the WTG marking the location with a hardened structure and attracting fishermen. While this is a potentially positive impact of the physical presence of the WTGs, it would also be considered an adverse impact for recreational

fishermen who previously utilized the location as a secluded fishing location because, during operation, the SFWF WTGs could potentially become a recreational fishing destination. In addition, increased fishing pressure on fish aggregations at the WTGs may result in increased recreational fishing mortality rates. If these circumstances arise, then ***long-term, minor*** to ***moderate, direct impacts*** are expected.

**SFWF Inter-Array Cable Maintenance**

Maintenance of the inter-array cables is considered a nonroutine event and is not expected to occur with regularity. Impacts associated with exposing the inter-array cables will be similar but less frequent to those described for the construction phase.

Commercial and recreational fisheries are expected to experience negligible impacts from the presence of the inter-array cable because it would be installed with a target burial depth of 6 feet (1.8 m) beneath the seabed. However, some areas of the inter-array cable may require armoring, which may cause short-term, minor, negative impacts on benthic or demersal species because of habitat modification. After recolonization, the armoring locations may provide ***long-term, minor, indirect, benefits*** to recreational fisheries that target certain recreational species that favor habitat in hardened structure. See Section 4.3.2 for more information about Benthic and Shellfish Resources and Section 4.3.3, for more information about Finfish and Essential Fish Habitat. The cable and possibly the presence of cable armoring may have a ***long-term, minor*** to ***moderate, direct, impacts*** on commercial fishermen using mobile, bottom-tending gear (such as bottom trawl or scallop dredge) for the same reasons described for likely impacts of the WTG foundations. The accidental snagging of mobile gear may result in ***minor-to-moderate, direct, impacts*** for those commercial fishing vessels.

**Vessel Anchoring and Spuds**

Vessels are not expected to anchor during O&M activities unless the inter-array cables or WTGs require maintenance. Impacts associated with potential vessel anchoring during operation are expected to be similar to but less frequent than those discussed in the Seafloor Preparation and Pile Driving/Foundation Installation section for the construction phase. Surveys for 1 year after the installation of the BIWF found no evidence of short- or long-term impacts to physical or biological habitats at the sites of anchor scarring — aside from the discrete disturbance of habitat. The survey data indicate recolonization of the disturbed seafloor by epifauna in less than 1 year (INSPIRE, 2017).

**Sediment Suspension and Deposition**

Increases in sediment suspension and deposition during O&M would primarily result from vessel anchoring and maintenance activities that require exposing the inter-array cables. Both activities are expected to be nonroutine events and are not expected to occur with regularity. Sediment suspension and deposition impacts to species targeted by commercial and recreational fisheries, because of vessel activity during SFWF O&M, are expected to be similar to vessel-related sediment suspension and deposition impacts described for the construction phase. Therefore, these impacts are expected to have similar ***negligible, short-term, indirect impacts*** on those commercial or recreational fisheries.

**Noise**

Impacts from vessel and aircraft noise during SFWF O&M are expected to be similar ***minor, short-term, indirect*** impacts described in the construction phase. Commercial and recreational fisheries are unlikely to experience direct impacts from WTG operational noise. Noise may have ***negligible*** to ***minor, indirect impacts*** on fisheries targeting the benthic and demersal species that

experience direct impacts due to noise. Discussion of the information available for underwater noise impacts on benthic and demersal species may be found in Section 4.3.2 and Section 4.3.3.

**Electromagnetic Fields**
EMFs from the SFWF inter-array cable may adversely impact certain finfish species and may result in ***indirect, negligible impacts*** on commercial and recreational fisheries that target those species. As described in Section 4.3.3 and Appendix K, the modeled EMF levels are below the level at which critical impacts on behavior are reported and are likely to have ***negligible impacts*** on marine organisms themselves.

**Traffic**
Impacts associated with traffic during O&M are expected to be similar to, but less frequent than, those discussed in the construction phase and may result in ***minor, short-term, direct impacts***.

***Decommissioning***

Decommissioning of the SFWF will have similar impacts as construction. After the SFWF is decommissioned, the area is expected to recover to pre-Project conditions.

### South Fork Export Cable

Table 4.6-30 summarizes the level of impacts expected to occur to commercial and recreational fisheries during the construction and decommissioning phases of the SFEC and Table 4.6-31 summarizes the level of impacts expected to occur during the O&M phases of the SFEC. Cable installation and decommissioning activities are generally expected to have ***minor, short-term impacts*** on access to fishing grounds because of safety restrictions on entering the area (Section 4.4.8 and Appendix E); and because of habitat modification that will impact some commercially and recreationally targeted species. O&M activities are expected to have some ***long-term, minor*** to ***moderate, direct impacts*** on certain commercial fisheries due to displacement of fishing activity and may have ***minor, beneficial impacts*** on recreational fisheries. Additional details on potential impacts to commercial and recreational fisheries from the various IPFs are described in the following sections.

**Table 4.6-30. IPFs and Potential Levels of Impact on Commercial and Recreational Fisheries at the SFEC - OCS and SFEC - NYS during Construction and Decommissioning**

| IPF | Potential Impact | Maximum Level of Impacts |
|---|---|---|
| Seafloor Disturbance | Seafloor Preparation (PLGR) | Minor, short-term, direct<br>Minor, short-term, indirect |
| | Pile Driving/Cofferdam Installation | Minor, short-term, direct<br>Minor, short-term, indirect |
| | SFEC Installation | Minor, short-term, direct<br>Minor, short-term, indirect |
| | Vessel anchoring (including spuds) | Minor, short-term, direct<br>Minor, short-term, indirect |
| Noise | Ship, Trenching, and Aircraft Noise | Negligible, short-term, indirect |
| | Pile Driving (Cofferdam) | Minor, short-term, indirect |
| Traffic | | Minor, short-term, direct |

**Table 4.6-30. IPFs and Potential Levels of Impact on Commercial and Recreational Fisheries at the SFEC - OCS and SFEC - NYS during Construction and Decommissioning**

| IPF | Potential Impact | Maximum Level of Impacts |
|---|---|---|
| Visible Structures | | Minor, short-term, direct |
| Sediment Suspension and Deposition | | Negligible |
| Discharges * | | Negligible |
| Trash and Debris * | | Negligible |

* Supporting information on the negligible level of impact from the Discharges and Trash and Debris IPFs is provided in Section 4.1.

**Table 4.6-31. IPFs and Potential Levels of Impact on Commercial and Recreational Fisheries at the SFEC - OCS and SFEC - NYS during Operations and Maintenance**

| IPF | Potential Impact | Maximum Level of Impacts |
|---|---|---|
| Seafloor Disturbance | Cofferdam | No impact |
| | SFEC | Minor, short-term, direct, and indirect<br>Moderate, long-term, direct |
| | Vessel Anchoring (including spuds) | Minor, short-term, direct<br>Minor, short-term, indirect |
| Ship and Aircraft Noise | | Negligible, short-term, indirect |
| Traffic | | Negligible, long-term, direct |
| Visible Structures | | Minor, long-term, indirect |
| EMF | | Negligible |
| Sediment Suspension and Deposition | | Negligible |
| Discharges * | | Negligible |
| Trash and Debris * | | Negligible |

* Supporting information on the negligible level of impact from the Discharges and Trash and Debris IPFs is provided in Section 4.1.

**SFEC – OCS**

***Construction***

**Seafloor Disturbance**

IPFs associated with seafloor disturbance during construction of the SFEC – OCS components have been split into seafloor preparation, SFEC – OCS installation, and vessel anchoring (including spuds).

In general, seafloor disturbance is expected to produce negligible to minor levels of direct and indirect impacts to species, depending on the mobility of the species present, which would in turn, result in ***short-***and ***long-term, negligible*** to ***moderate levels of indirect impacts*** to

commercial and recreational fisheries that target the directly impacted species. For all construction activities, seafloor disturbance is expected to result in ***minor, short-term, direct impacts*** on commercial and recreational fisheries due to the short-term disruption of access to fishing areas for safety. Additional indirect impacts to commercial and recreational fisheries from the various components of seafloor disturbance are described in the following paragraphs.

**Seafloor Preparation**
Seafloor preparation activities for the construction of the SFEC are expected to have similar impacts on commercial and recreational species as described for the SFWF. The impacts are expected to be ***minor, short-term, and indirect*** for fisheries targeting more mobile species, which are likely to temporarily vacate the area but may be subject to limited injury or mortality. These species are likely to return to the area after the construction phase. ***Minor*** to ***moderate, short-term, indirect impacts*** are expected for fisheries targeting less mobile species. For more information, see Section 4.3.2.

**SFEC – OCS Installation**
The installation of the SFEC – OCS is expected to have similar impacts as described for the installation of the SFWF inter-array cable. It is expected to have ***minor-to-moderate, short-term, direct impacts*** on benthic species due to habitat modification, depending on the mobility of the species. Therefore, the installation is expected to have ***minor, short-term, indirect impacts*** on commercial and recreational fisheries that target these species. The installation method is designed to reduce impact to benthic habitats to the actual width of the SFEC itself.

**Vessel Anchoring and Spuds**
Vessel anchoring and spuds will have ***minor, indirect impacts*** in the short-term to fisheries due to the impact on benthic habitat. The habitat is expected to experience rapid recovery after disturbance to benthic habitat (Guarinello et al., 2017). Vessel anchoring may result in ***direct minor*** and ***short-term impacts*** due to the displacement of habitat.

**Sediment Suspension and Deposition**
Sediment suspension and deposition impacts from construction of the SFEC – OCS are expected to have similar ***negligible impacts*** on commercial and recreational fisheries as those described for the SFWF inter-array cable.

**Noise**
Commercial and recreational fisheries are unlikely to experience direct impacts due to noise, because fishing activity would be temporarily restricted in the immediate area of the installation activities. The impacts from SFEC vessel and trenching noise during construction are expected to be similar to those described for the SFWF; ***negligible, short-term indirect***. Discussion of the information available for underwater noise impacts on benthic and demersal species is described in Section 4.3.2 and Section 4.3.3.

**Traffic**
Traffic during the construction of the SFEC is expected to have similar impacts (***negligible, long-term, direct***) on commercial and recreational fisheries as those described for the SFWF.

***Operations and Maintenance***

**Seafloor Disturbance**
IPFs associated with seafloor disturbance during O&M of the SFEC – OCS have been split into SFEC maintenance (repairs) and vessel anchoring (including spuds). In general, seafloor disturbance is expected to produce ***negligible to moderate, direct and indirect impacts to fisheries***, depending on the mobility of the species present that are targeted by commercial and

recreational fishermen. Additional indirect impacts to commercial and recreational fisheries from the various components of seafloor disturbance are described in the following paragraphs.

**SFEC Cable**

Maintenance of the SFEC is considered a nonroutine event and is not expected to occur with regularity. Impacts associated with exposing the SFEC would be similar but less frequent than those described for the construction phase.

Commercial and recreational fisheries are expected to experience ***negligible impacts*** from the presence of the SFEC because it will be buried beneath the seabed. However, some areas of the SFEC may require armoring, which may cause ***short-term, minor impacts*** on benthic or demersal species because of habitat modification. After recolonization, the armoring locations may provide ***long-term, minor-to-moderate, indirect, benefits*** to recreational fisheries that target certain recreational species that favor habitat in hardened structure. For additional information, see Section 4.3.2 and Section 4.3.3. There is no planned restriction on fishing for any gear type in the vicinity of the SFEC. However, some fishermen may choose not to fish using bottom-tending (mobile) gears. In these instances, this shift in fishing activity would be a ***long-term, minor to moderate impact*** on bottom trawl and scallop dredge gears.

The potential use of armoring on the SFEC - OCS may cause ***long-term, minor, negative impacts*** on benthic species because of habitat modification, which may lead to ***long-term, minor, indirect impacts*** on commercial and recreational fisheries targeting these benthic species. Although there is no planned restriction on fishing for any gear type in the SFEC - OCS, some commercial fishermen may choose not to fish using bottom-tending (mobile) gears. This is interpreted as a ***long-term, minor*** to ***moderate impact*** on bottom trawl and scallop dredge gears that are used in the SFEC. However, fishing activity is expected to continue in areas near the SFEC - OCS after construction activities are completed. Commercial fishing activity using fixed gear (such as lobster pots) is expected to continue in nearby areas after installation is completed.

**Vessel Anchoring and Spuds**

Vessels are not expected to anchor during O&M activities unless the SFEC requires maintenance. Impacts associated with potential vessel anchoring during O&M of the SFEC are expected to be similar to but less frequent than those described for the construction phase, and may include both ***minor, short-term, direct and indirect impacts***.

**Sediment Suspension and Deposition**

Impacts from increased sediment suspension and deposition to commercial and recreational fisheries in the SFEC – OCS during O&M are expected to be similar to the ***negligible impacts*** described for O&M of the SFWF inter-array cable.

**Noise**

Commercial and recreational fisheries are expected to experience ***negligible impacts*** from vessel or aircraft noise during the SFEC – OCS O&M phase. Impacts from vessel and aircraft noise during O&M of the SFEC are expected to be similar to, but less frequent than those described for the construction phase. Discussion of the information available for underwater noise impacts on benthic and demersal species may be found in Section 4.3.2 and Section 4.3.3.

**Electromagnetic Fields**

EMF impacts to commercial and recreational fisheries from the SFEC during O&M are expected to be similar to the ***negligible impacts*** described for O&M of the SFWF inter-array cable.

**Traffic**
Traffic during the O&M of the SFEC is expected to have similar ***negligible, long-term, direct impacts*** on commercial and recreational fisheries as those described for the SFWF.

### *Decommissioning*

Decommissioning of the SFEC – OCS would have similar impacts as construction. After the SFEC - OCS is decommissioned the area is expected to recover to pre-Project conditions.

## SFEC - NYS

### *Construction*

**Seafloor Disturbance**
IPFs associated with seafloor disturbance during construction of the SFEC – NYS have been split into seafloor preparation, pile driving for installation of the short-term cofferdam, SFEC – NYS installation, and vessel anchoring (including spuds).

In general, seafloor disturbance is expected to produce the same impacts as described for construction of the SFEC – OCS. Seafloor disturbance is expected to produce ***negligible to moderate direct and indirect impacts*** to species, depending on the mobility of the benthic species, shellfish, and finfish species present — which will in turn result in ***short-term and long-term, negligible to moderate indirect impacts*** to commercial and recreational fisheries that target the directly impacted species. For all construction activities, seafloor disturbance is expected to result in ***minor, short-term direct impacts*** on commercial and recreational fisheries due to the short-term disruption of access to fishing areas for safety. Additional indirect impacts to commercial and recreational fisheries from the various components of seafloor disturbance are described in the following paragraphs.

**Seafloor Preparation**
Seafloor preparation is expected to produce the same impacts (***minor, short-term, and indirect*** for fisheries targeting more mobile species and ***minor-to-moderate, short-term, indirect*** impacts for fisheries targeting less mobile species) as described for construction of the SFEC – OCS.

**Pile Driving and Cofferdam Installation**
Installation of a cofferdam will result in a ***minor, short-term, direct impact*** from short-term disruption of access to fishing areas. Construction of the cofferdam would result in ***moderate, short-term, direct impacts*** to species with limited mobility, and ***minor, short-term, direct*** impacts to mobile species, for those species that have preferred habitat in the SFEC - NYS area (Table 4.3-3). Commercial fisheries that target these species may have ***minor, short-term, negative impacts*** (for species including ocean quahog clam, Atlantic surfclam, Atlantic sea scallop, and American lobster). There are ***no direct impacts*** expected for recreational fishing in the short or long-term.

**SFEC - NYS Installation**
The installation of the SFEC - NYS is expected to have the same impacts (***minor, short-term, indirect impacts***) as described for construction of the SFEC - OCS.

**Vessel Anchoring and Spuds**
Vessel anchoring and spuds are expected to produce the same impacts (***minor, indirect impacts***) as described for construction of the SFEC - OCS.

**Sediment Suspension and Deposition**
Sediment suspension and deposition are expected to produce the same ***negligible*** impacts as described for construction of the SFEC – OCS.

**Noise**
Commercial fisheries are unlikely to experience direct impacts of noise from pile driving for the cofferdam or from trenching or vessel activity because fishing activity will be temporarily restricted in the immediate area of the installation activities. The impacts from SFEC construction noise are expected to be similar to those described for the SFWF (***negligible, short-term*** and ***indirect***). Discussion of the information available for underwater noise impacts on benthic and demersal species may be found in Sections 4.3.2 and 4.3.3.

Shoreside recreational fishermen may be deterred from fishing in the vicinity of the cofferdam pile driving activity due to vibratory hammer sounds. This activity is expected to have a ***short-term, minor, direct impact*** on recreational fishing activity in the area.

**Traffic**
Traffic during the construction of the SFEC – NYS is expected to have similar impacts (***negligible, long-term,*** and ***direct***) on commercial and recreational fisheries as those described for the SFEC – OCS and the SFWF.

**Visible Structures**
The physical presence of visible structures is expected to produce the same impacts (***minor, short-term,*** and ***direct***) as described for construction of the SFEC – OCS.

### *Operations and Maintenance*

**Seafloor Disturbance**
IPFs associated with seafloor disturbance during O&M of the SFEC – NYS have been split into cofferdam, SFEC maintenance, and vessel anchoring (including spuds). In general, seafloor disturbance is expected to produce ***negligible*** to ***moderate levels of direct*** and ***indirect impacts*** to fisheries, depending on the mobility of the benthic species, shellfish, and finfish species present that are targeted by commercial and recreational fishermen.

**Cofferdam**
The cofferdam will be a short-term structure used during the construction phase only. As described in Sections 4.3.2.2 and 4.3.3.2, no conversion of habitat is expected and no long-term impacts are expected related to the displacement of fishing activity or species that are targeted by commercial and recreational fisheries. Therefore, the cofferdam is expected to have ***negligible, short-term, minor impacts*** to fisheries.

**SFEC Cable**
Impacts from maintenance and the presence of the SFEC – NYS are expected to be similar to those described for O&M of the SFEC – OCS (***long-term, minor*** to ***moderate impact*** on bottom trawl and scallop dredge gears and ***long-term, minor*** or ***moderate, indirect, beneficial impacts*** to recreational fisheries).

**Vessel Anchoring and Spuds**
Vessel anchoring and spuds are expected to produce the same impacts as described for O&M of the SFEC – OCS (***minor, short-term, direct*** and ***indirect impacts***).

**Sediment Suspension and Deposition**
Sediment suspension and deposition is expected to produce the same ***negligible impacts*** as described for O&M of the SFEC – OCS.

**Noise**
Ships and aircraft noise are expected to produce the same ***negligible impacts*** as described for O&M of the SFEC – OCS.

**Electromagnetic Fields**

***Negligible impacts*** to finfish in the SFEC - NYS during O&M are expected to be similar to those described for the O&M phase of the SFEC – OCS and the SFWF inter-array cable.

**Traffic**

Traffic during the O&M of the SFEC – NYS is expected to have similar, ***negligible, long-term, direct impacts*** on commercial and recreational fisheries as those described for the SFEC – OCS and the SFWF.

***Decommissioning***

Decommissioning of the SFEC – NYS would have similar impacts as construction. After the SFEC – NYS is decommissioned, the area is expected to recover to pre-Project conditions.

### 4.6.5.3 Proposed Environmental Protection Measures

Several environmental protection measures will reduce potential impacts to commercial and recreational fishing.

- The SFWF WTGs will be spaced at least 0.8 miles (1.3 km, 0.7 nm) statute miles apart, and in an approximate east-west/north-south grid layout, to maintain navigability for fishing vessels and fishing activity.
- The inter-array cable and SFEC - Offshore will be buried to a target depth of 4 to 6 feet (1.2 to 1.8 m).
- The SFEC sea-to-shore transition will be installed via HDD to avoid impacts to the dunes, beach, and near-shore zone, including sensitive shoreline habitats and shoreline fishing areas.
- As appropriate and feasible, BMPs will be implemented to minimize impacts on fisheries, as described in the *Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development* (BOEM, 2015).
- Siting of the SFWF and SFEC - Offshore were informed by site-specific benthic habitat assessments and Atlantic cod spawning surveys.
- DWSF is committed to collaborative science with the commercial and recreational fishing industries pre-, during, and post-construction.
- Each WTG will be marked and lit with both USCG and approved aviation lighting.
- DWSF will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.
- Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D).
- Communications and outreach with the commercial and recreational fishing industries will be guided by the Project-specific Fisheries Communications Plan (Appendix B to this COP). This outreach will be led by the DWSF Fisheries Liaisons. Fisheries Representatives from the ports of Montauk, Point Judith, and New Bedford represent the fishing community.
- A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Fisheries Liaison, a Project website, and public notices to mariners and vessel float plans (in coordination with USCG).

For information related to minimizing impacts to finfish and essential fish habitat resources, see Section 4.3.3, and for impacts to benthic resources, see Section 4.3.2.

## 4.6.6 Commercial Shipping

This section discusses the commercial shipping activities that may be impacted by the construction, O&M, or decommissioning of the proposed SFWF and SFEC. The section is support by a detailed navigational safety risk assessment (NSA) prepared for the SFWF and is included in Appendix X. The NSA includes a detailed analysis of marine traffic, possible interference with navigation, and assessment of risk of collision with other vessels, or allision with fixed structures, such as WTGs. Although the NSA addresses all types of vessel traffic, this section focuses on the findings specific to commercial shipping. The NSA was prepared in accordance with USCG guidance for Offshore Renewable Energy Installations (OREIs), as noted in the Navigation and Vessel Inspection Circular (NVIC) 02-07, as presented in Appendix X. Consultations were also held with the USCG and marine transportation stakeholders.

An overview of commercial shipping in the SFWF and SFEC is presented in Section 4.6.6.1. A summary of potential impacts from SFWF and SFEC activities on commercial shipping, including results of the NSA, is provided in Section 4.6.6.2 for each of the relevant IPFs described in Section 4.1.

### 4.6.6.1 Affected Environment

#### Regional Overview

Commercial shipping within the region includes cargo vessels transiting to or from ports in the Narragansett Bay, Buzzard Bay, and Long Island Sound area. It also includes vessels transiting between a variety of other ports including the Port of New York and New Jersey, the Port of Boston, and other ports located on the east coast or abroad (RICRMC, 2010).

#### South Fork Wind Farm and South Fork Export Cable

Because similar data and maps will be used to describe the impacted environment for the SFWF and SFEC, they are described together in this section.

Marine transportation in the Block Island and Rhode Island Sounds region is characterized by a range of vessel types and activities. Commercial shipping involves the transport of goods such as petroleum products, coal, and cars through this area, while passenger ferries and cruise ships transport people between nearby coastal communities. Pilot boats, government enforcement vessels, and search and rescue vessels provide critical support to commercial vessel operations and facilitate safe navigation (RICRMC, 2010).

For the purposes of this section, commercial shipping refers to the activity of tankers, cargo vessels, tugs, and barges. Vessels in the SFWF and SFEC that fall under other categories are discussed in the NSA report (Appendix X) and in the following sections of the COP:

- Recreation and Tourism – Section 4.6.4
- Commercial and Recreational Fishing – Section 4.6.5
- Other Marine Uses – Section 4.6.8

#### *Designated Commercial Shipping Lanes*

The SFWF is located south-southeast of entrance to Narragansett Bay and almost due south of the entrance to Buzzards Bay. There are two main shipping lanes and a marine traffic roundabout located west of the SFWF, as shown on Figure 2-1 in Appendix X. The North Lease area,

including the SFWF, was defined by BOEM to avoid these shipping lanes and other marine space-use conflicts (*see* Section 2 for a discussion about the evolution of siting the SFWF).

The Narragansett Bay Traffic Separation Scheme roundabout (Figure 2-1, Appendix X) is a routing measure aimed at the separation of opposing streams of traffic by the establishment of shipping lanes, shipping zones, recommended routes, and precautionary areas (U.S. Department of Homeland Security, 2010). Vessel traffic and navigation in the area may at times be impacted by restrictions. The SFWF and SFEC are within the Narragansett Bay Special Operating Area (OPAREA) Complex boundary, within which national defense training exercises are routinely conducted (NOAA, 2018). The OPAREA includes Block Island Sound and Rhode Island Sound, and extends seaward to the south. The SFWF also lies within a seasonal North Atlantic right whale speed-restriction area, which requires seasonal vessel speed reductions (NOAA, 2017e).

No designated commercial shipping lanes are located along the SFEC route, as shown on Figures 2-1 and 3-4 in Appendix X.

### *Vessel Traffic*

Marine traffic patterns in the area were assessed using Automatic Identification System (AIS) data. AIS data on vessel traffic are collected by the USCG through a navigation safety device that transfers large vessel information in real time. All self-propelled vessels of more than 1,600 gross tons are required to carry AIS, with certain exceptions made for foreign vessels. These data provide a quantifiable and reliable method to determine the primary traffic patterns and analyze the size, speed, and movements of vessels in the region. As described in Appendix X, AIS data were obtained for the most recent available full-year period. The data include all AIS entries with a timestamp from “2016-07-18 00:00” through “2017-07-18 13:00” Coordinated Universal Time (UTC). AIS data allow the traffic to be converted into vessel tracks that are conducive to a quantitative analysis. For instances when the AIS data did not appear to provide sufficient information to fully depict the traffic patterns, the AIS maps were supplemented with data obtained from the Northeast Ocean Data portal.

The AIS data show that traffic is most dense through Rhode Island Sound and along the traffic separation zones. The Narragansett Bay traffic separation zone, with commercial traffic transiting north-south, is more than 7 nm (13 km) to the northwest of the SFWF. Traffic continues transiting from the Narragansett Bay traffic separation zone in a north-south direction past the SFWF through the precautionary zone. To the north of the SFWF, the Buzzards Bay traffic separation zone is more than 4 nm (7.4 km) from the SFWF and more than 1.5 nm (2.8 km) from the northwesternmost portion of the lease area (Figure 3-4 of Appendix X). Vessel traffic is also indicated along the general route of the SFEC, but additional analysis in Appendix X indicates that closer to the Long Island and Block Island shorelines, to the northwest of the SFWF, this traffic is primarily tugs and tow boats, with the larger cargo vessels transiting further offshore than in the location of the SFEC route.

Appendix X indicates that the traffic density shows relatively low AIS point density in the SFWF. In line with the calculated vessel tracks, there are areas of higher density north of the lease area. East Passage has areas of high density that continue through the pilot boarding area and the north-south Narragansett Bay Traffic Separation Zone (Figure 3-5 of Appendix X).

Deep draft commercial vessels (cargo/carriers and tankers) transit the main shipping routes following the designated traffic separation zones as is expected. Deep draft vessels predominantly transit three main courses, primarily outside of the SFWF as depicted on Figure 3-6 of Appendix X. In the vicinity of the SFWF, cargo vessels show greatest traffic

density following the Traffic Separation Scheme into Narragansett Bay, with some traffic traversing the SFWF WTG area (indicated as "low" frequency on the density map).

Passenger vessels (including ferries and cruise ships) tend to strictly follow Narragansett Bay inbound and outbound lanes to and from East Passage (Figure 3-10 of Appendix X). This route transits to the west of the SFWF and diverges south after the defined precautionary area, which consists of vessels operating between Narragansett Bay or Buzzards Bay and an established traffic lane. A smaller percentage of the passenger traffic transits southwest-northeast along the recommended vessel route through Buzzards Bay. According the NSA report (Appendix X), passenger vessels in the SFWF and SFEC are typically large vessels; therefore, it is expected that most passenger vessels will transit the same routes taken by deep draft vessels. Passenger vessels are typically well represented in AIS data sets.

The AIS tracks for tugs are concentrated primarily to the northwest of the lease area, as shown on Figure 3-13 of Appendix X. Tugs transit to and from various port locations, with the southernmost location being New Harbor in Great Salt Pond on Block Island, and other locations north of Point Judith, Rhode Island. Tug and tow vessel traffic is reported to track closer to the coasts of the nearby coastal states and rarely transits the SFWF WTG area.

AIS tracks for "other" vessel types, which include AIS vessel subcategories that do not successfully fit into other defined categories, such as research vessels, "special vessels," and drill ships. From the data set, these vessels appear to rely less on defined shipping channels but still occasionally transit Narragansett Bay inbound and outbound lanes to the west of the SFWF project area. Areas of tracks are present that indicate systematic vessel movements, which typically indicate movements of a research vessel (Figure 3-14 of Appendix X).

Additionally, the SFEC – OCS will cross the southern seaward edge of the Narragansett Bay Traffic Separation Scheme and the vessel traffic paths leading to Narragansett Bay. As the SFEC – OCS and SFEC – NYS approach the southern coast of eastern Long Island, only tugs, towing vessels, fishing vessels, and recreational boats are expected to occur. Additionally, much of the vessel traffic that transits the SFEC – OCS through the north-south Narragansett Bay Traffic Separation Zone will largely be deep draft vessels (cargo/carrier and tankers); the normal traffic patterns of these transits are not expected to be significantly disrupted by the SFEC.

### *Vessel Statistics*

The analysis in Appendix X shows the distribution of vessel types that transit near the lease area using cross sections of major marine routes. Most of the traffic data collected from around the lease area show low annual traffic counts, with less than 30 transits per year. One cross section has a slightly higher annual traffic count with 60 transits per year. The cross section with the higher count represents an area where vessel tracks are merging into and out of the Buzzards Bay inbound traffic lane, but this area does not cross through the SFWF lease area.

Half of the traffic captured by cross sections to the north of the lease area are from pleasure or recreation vessels, with "other" vessels being the next largest contributor. The cross section that captures vessels merging in and out of the traffic separation zones shows that 55 percent of the tracks captured are from deep draft vessels (cargo/carrier and tankers). Most transits (76 percent) captured in the cross section to the southwest of the SFWF are from other passenger or pleasure vessels (Figure 3-15 from Appendix X). A 5-mile (8-km) buffer around the AIS data set was used to determine the vessel types transiting the SFWF project area. Of the vessel types identified, the AIS data suggest that only fishing vessels, "other" vessels, and pleasure or recreational vessels currently transit within the SFWF.

### *Vessel Size*

This section describes the average vessel sizes by vessel type and the number of vessels within 5 miles (8 km) of the SFWF. For deep draft vessels, the AIS-recorded size is likely close to reality. For smaller vessels, AIS may overestimate their average sizes because, typically, only the largest vessels are equipped with AIS transponders. Table 3-2 in Appendix X presents the average dead-weight tonnage (DWT), length overall (LOA), and beam for the vessel types near and within 5 miles (8 km) of the SFWF. As expected, tankers (both with hydrocarbon cargo and non-hydrocarbon cargo) are the largest in terms of DWT, as well as being one of the largest vessel types in terms of LOA. Cargo/carriers, tankers, and passenger vessels are the largest in terms of LOA and beam.

A 5-mile (8-km) buffer around the AIS data set was used to determine the average size of vessels near the SFWF. The average DWT, LOA, and beam for vessels within 5 miles (8 km) of SFWF is presented in Table 3-3 of Appendix X. Tankers (regardless of cargo type) are the largest in terms of DWT, while passenger vessels are the largest in terms of LOA and beam. For this data set, it was determined that all passenger vessels within 5 miles (8 km) of the SFWF are cruise ships. Smaller passenger vessels and ferries travel closer to shore while only large cruise vessels travel in open water near the SFWF project area.

### *Traffic Speed*

The NSA also evaluated vessel speeds in the study area by vessel type. Figure 3-18 of Appendix X presents the total AIS data set speed profile; most vessel transits are between 8 and 12 knots.

#### 4.6.6.2 Potential Impacts

Construction, O&M, and decommissioning activities associated with the Project have the potential to cause direct and indirect impacts on commercial shipping activity as discussed in the following sections. IPFs associated with the Project phases are described in Section 4.1.

An overview of the potential impacts on commercial vessel activity due to Project activities is presented on Figure 4.6-6.

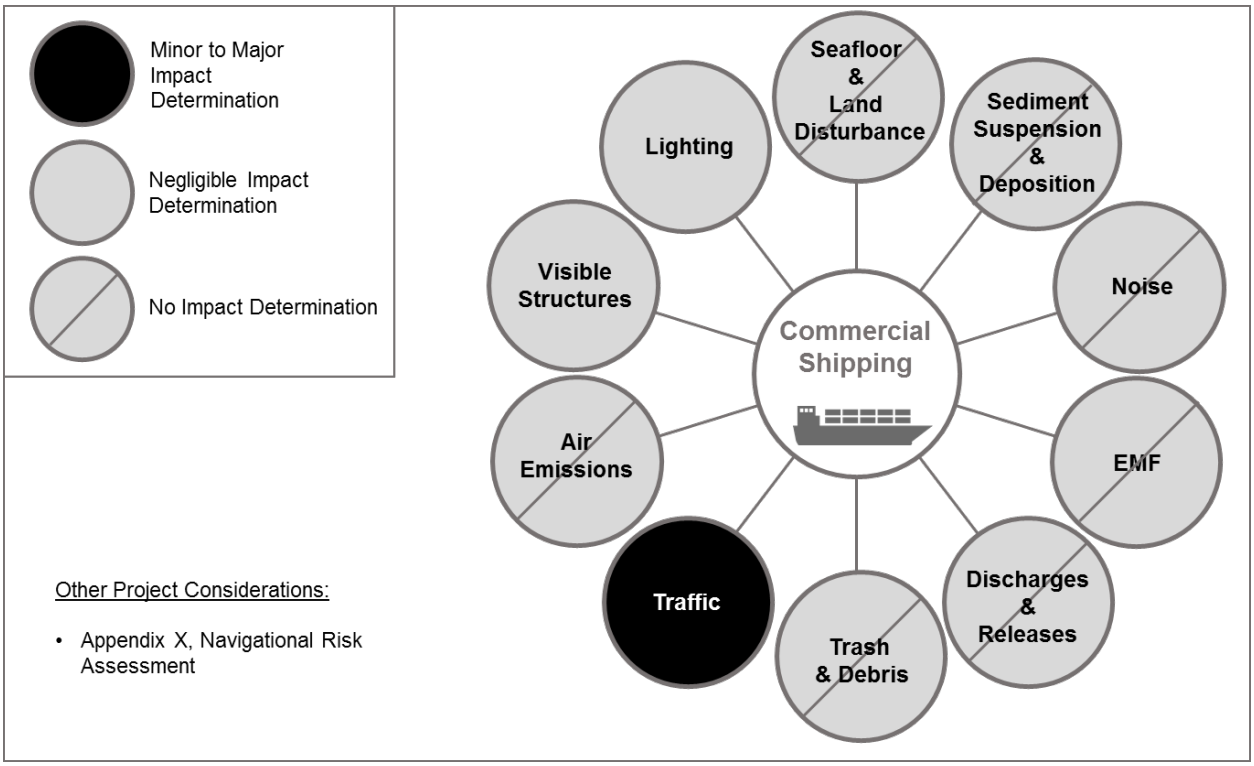



**Figure 4.6-6. Impact-producing Factors on Commercial Shipping**

**South Fork Wind Farm**

The NSA did not identify major areas of concern regarding the SFWF impact on marine navigation. The SFWF is located in open water over 4 nm (7.4 km) from high-vessel density deep draft commercial shipping lanes, approximately 15 nm (28 km) from the closest land mass (Block Island), and approximately 19 nm (35 km) from the mainland.

***Construction***

**Traffic**

Given the Project location relative to major commercial shipping lanes (not including commercial fishing), there is not expected to be a significant disruption of the normal traffic patterns during the construction or installation of the SFWF. The number of vessels that will operate during the SFWF construction phase is expected to result in a ***negligible impact*** and risk addition to normal traffic patterns.

SFWF construction is anticipated to take place in work windows for specific construction activities that will limit the number of vessels introduced to local traffic at one time. Potential tasks to be completed individually in a work window include WTG jacket foundation installation, offshore cable line installation, and final WTG installation. The vessels that are anticipated to be present during construction of the SFWF include construction barges, support tugs, jack-up rigs, supply/crew vessels, and cable laying vessels. These vessels will also be present in the region during decommissioning of the SFWF. The highest navigation risk during construction would be smaller vessels operating close to construction and work vessels during construction operations. This risk is mitigated by a safety zone that is anticipated to be implemented by USCG during construction operations (Section 4.6.6.3).

Informal consultation with the Northeast Marine Pilots Association indicates that the SFWF may have a ***negligible*** to ***minor impact*** on commercial traffic in the region during construction.

During construction of the SFWF, the pilotage association would assess the requests on a case-by-case basis to determine whether the vessel can safely transit southeast around or through the SFWF.

### *Operations and Maintenance*

**Visible Structures**

Based on discussions with USCG Sector Southeastern New England, it is confirmed that there is not expected to be safety or exclusion zones during operation of the SFWF. Therefore, vessels are free to navigate within, or close to, the SFWF. It is expected that mariners, including SFWF service vessels, would strictly adhere to all the International Regulations for Preventing Collisions at Sea 1972 (COLREGs) and be aware of the prevailing environment and situation to avoid unsafe situations. The WTG layout at the SFWF provides sufficient sea room for most vessels to transit between WTGs if the risks have been considered and a vessel is transiting at a safe speed per COLREGs. In addition, it is expected that deep draft and commercial vessels (excluding commercial fishing vessels) will not choose to transit through or near the wind farm because the SFWF is more than 4 nm (7.4 km) from major commercial shipping lanes (excluding commercial fishing frequented areas) and directly east of the precautionary area after the traffic separation zones end.

Assessment of collision, allision, and grounding annual frequency was conducted for current traffic conditions ("Base Case") and for traffic conditions after operation of the SFWF ("Future Case"). There is an overall small increase of predicted incident frequencies from the Base Case to the Future Case. An overall percent increase of 0.4 percent of annual marine incidents in the study area is estimated due to the presence of the SFWF (Appendix X).

The slight predicted increase in incidents is attributable to the following:

- Some traffic may be re-routed after the WTGs are installed, which could increase the distance traveled and could result in additional time and costs to shipping.
- The incident frequency of commercial shipping traffic re-routing may send some vessels closer to the shoreline, which could increase the likelihood of a grounding event.
- A projected increase in passenger transits from passenger vessels conducting tours of the SFWF.
- An extremely small increase in allisions with WTGs present (only 1 allision in 126 years was projected).

This small increase in traffic incident frequency represents a ***negligible*** to ***minor impact*** on commercial shipping.

The NSA (Appendix X) also analyzed the impact of the SFWF on visual navigation and potential impacts on collision avoidance. The USCG reported that the largest concern would be the ability of mariners to see through the SFWF to the traffic on the other side. Analyses presented in Appendix X concluded that the SFWF would pose a minimal visual obstruction to mariners transiting through or past the SFWF. In addition, the SFWF would not have an adverse impact on a mariner's ability to use marked Aids to Navigation (ATON) as described in Appendix X.

DWSF's informal consultation with the Northeast Marine Pilots Association indicates that the Association feels that the SFWF is not expected to have a significant impact on commercial traffic in the region during O&M. The SFWF is located far enough from commercial traffic lanes that with proper navigational marking, it is not expected to pose adverse impacts on commercial

traffic. A ***minor impact*** identified is that occasionally vessels, primarily passenger vessels, would request to deviate from the north-south traffic separation zone and request to transit to the southeast to reach Boston. During O&M of the SFWF, the pilotage association would assess requests for determining vessel transit around or through the SFWF.

**Visible Structures**
Because of the spacing between WTGs and the linear WTG placement, the structures are not anticipated to significantly increase risk to vessels operating within the boundaries of the SFWF. Any risk increase is considered a ***negligible impact***.

As described in the Traffic IPF section (Section 4.1), a small 0.4 percent increase is estimated in annual marine incidents (from collision, allision, and grounding) in the NSA study area from the presence of the SFWF (Appendix X). Potential consequences of a powered allision are detailed further in Section 6 of Appendix X, which describes the impact analysis of vessels with a WTG. Although potential consequences have the possibility of being severe, it is important to consider the frequency of powered allisions when considering the consequence. Not all vessel types could cause severe consequences. The vessel types that have the potential to cause severe consequences are cargo/carrier and tankers (regardless of product). When combining the frequency of these vessel types in the SFWF, the resulting frequency of any powered allision is extremely low (5.4E-06). This event has a return period of 1 in every 184,200 years, making this an unlikely event.

The NSA also evaluated the impact the SFWF could have on normal operations, including anchorage areas. As described in Appendix X, the SFWF is expected to have ***no impact*** on vessel anchorage operations.

**Lighting**
Project lighting will meet BOEM and USCG requirements. USCG-approved navigation lighting is required for all vessels, for the OSS platform, and for WTGs during operation so that the vessels and structures are visible to other vessels and aircraft.

Impacts of navigational lighting on commercial shipping during O&M are considered ***long-term*** and ***negligible***. In fact, the lighting serves as a required safety feature for navigating vessels.

### *Decommissioning*

Decommissioning of the SFWF is expected to have similar impacts on commercial shipping as those described for the construction phase. Ultimately, commercial shipping activity in the SFWF area is expected to return to pre-Project conditions when the facility is decommissioned.

## SFEC – OCS and SFEC – NYS Waters

### *Construction*

**Traffic**
Given the Project location relative to major commercial shipping lanes (not including commercial fishing), there is not expected to be a significant disruption of the normal traffic patterns during the construction of the SFEC. The number of vessels that will operate during the SFEC construction phase is expected to have a ***negligible impact*** to normal traffic patterns. Other traffic-related impacts on commercial shipping during construction of the SFEC are expected to be similar to those described for the SFWF construction phase.

In addition, based on informal consultation with the Northeast Marine Pilots Association, ***no impacts*** or issues on navigation are anticipated as a result of the SFEC or SFEC route (Section 3.3 of Appendix X).

### *Operations and Maintenance*

**Traffic**
Impacts associated with traffic during O&M are expected to be similar to, but less frequent than, those discussed in the construction phase.

**Visible Structures**
Although not visible, the impact of the presence of the SFEC on anchorage areas was evaluated in the NSA (Appendix X). There are no designated anchorage areas within the vicinity of the SFEC route. Therefore, the SFEC would not interfere with normal vessel anchorage activities. However, deviations from "normal" anchorage activities have the potential to introduce additional risk of damage to the SFEC. Ships rarely drop anchors, especially outside of normal operations, but a vessel could damage the SFEC if it dropped an anchor directly on top of the SFEC or dragged it across the SFEC. However, as described in Section 4.6.6.3, proper marking of the SFEC on navigation charts would reduce this risk.

### *Decommissioning*

Decommissioning of the SFEC is expected to have similar impacts on commercial shipping as described for the construction phase. Ultimately, the SFEC is expected to return to pre-Project conditions.

#### 4.6.6.3 Proposed Environmental Protection Measures

Several environmental protection measures will reduce potential impacts to commercial shipping.

- The SFWF WTGs will be spaced at least 0.8 miles (1.3 km, 0.7 nm) apart, and in an approximate east-west/north-south grid layout, to maintain navigability.
- Each WTG will be marked and lit with both USCG and approved aviation lighting. AIS will be installed at the SFWF marking the corners of the wind farm to assist in safe navigation.
- All appropriate lighting and marking schemes, based on current regulations, will be implemented.
- DWSF will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.
- Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D).
- Project construction, O&M, and decommissioning activities will be coordinated with appropriate contacts at USCG and DOD command headquarters.
- A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Fisheries Liaison, Project website, and public notices to mariners and vessel float plans (in coordination with USCG).

## 4.6.7 Coastal Land Use and Infrastructure

This section describes the affected environment and provides an assessment and discussion of potential impacts for existing coastal land use and infrastructure during construction, O&M, and decommissioning of the SFWF and SFEC. To characterize existing coastal land uses and

infrastructure within the vicinity of the various Project components, current public data sources related to land use and zoning in East Hampton, Suffolk County, and on eastern Long Island, including local and state-agency published reports and the Visual Impact Assessment for the SFWF (Appendix V) were reviewed.

#### 4.6.7.1 Affected Environment

The affected environment for coastal land use and infrastructure includes the staging ports as well as the location for the SFWF O&M facility. The affected environment for the SFEC includes the lands along the potential onshore routes for the SFEC – Onshore from the sea-to-shore transition vault at the potential landing sites on the south coast of Long Island to the SFEC – Interconnection Facility. The previous sub-sections within Section 4.6, Socioeconomics, provided a detailed presentation of the demographic and economic setting for the SFWF and SFEC. The following sections focus on the limited coastal areas that may be impacted by anticipated Project activities.

**Regional Overview**

The SFWF and much of the SFEC will be located on the southern New England OCS, on the northern end of the Mid-Atlantic Bight. Existing coastal land uses in the region consist of the developed and undeveloped coastlines of Connecticut, New York, Rhode Island, and Massachusetts. The coastal areas closest to the SFWF and SFEC are Block Island, Rhode Island; Montauk, Long Island; and Martha's Vineyard and Nantucket, Massachusetts.

**South Fork Wind Farm**

There are no existing coastal uses or infrastructure within the lease area where the SFWF will be located. Existing marine uses of this area are addressed in Section 4.6.4, Recreation and Tourism; Section 4.6.5, Commercial and Recreational Fishing; Section 4.6.6, Commercial Shipping; and, Section 4.6.8, Other Marine Uses.

However, the SFWF includes a land-based O&M facility that will be built to support SFWF O&M activities (Section 3.1.2.5). The O&M facility will be in an existing port either in Montauk, East Hampton, New York or in Quonset Point, North Kingstown, Rhode Island.

Coastal land use and infrastructure within Montauk and Quonset Point are characterized as established maritime commercial and industrial areas with nearby population centers. Montauk is the easternmost area of the South Fork of Long Island, supports the largest commercial fishing port in New York State, and consists of high density commercial and residential development with large seasonal population influxes from recreation and tourism (Liquori and Nagle, 2005). Quonset Point is a multimodal business park consisting of marine terminal facilities, airport and mixed commercial and industrial uses located on Narragansett Bay. The *Quonset Business Park Master Land Use* categorizes the districts within the park that support waterfront and water-dependent uses and the planning and regulatory processes for future uses (Maguire Group Inc., 2008).

**SFEC – Offshore and SFEC – NYS**

The coastal land use and infrastructure associated with the SFEC – OCS and SFEC - NYS are similar to the broader regional and SFWF settings. Both segments occupy areas of open water with no existing coastal infrastructure.

### SFEC – Onshore

The SFEC – Onshore is the onshore component of the export cable that extends from the landing site to the SFEC – Interconnection Facility. Generally, as shown on Figures 4.6-7 and 4.6-8, the existing land uses along the SFEC – Onshore are predominantly low-medium residential (all single-family residences) and vacant land (undeveloped land not reserved as a community preservation area or a nature preservation area). The surrounding land uses and adjacent to the SFEC – Onshore also include commercial, transportation (i.e., land associated with the LIRR and East Hampton Airport), industrial, agricultural, institutional/community facilities (including schools, libraries, fire departments, police stations, religious centers, and recreational facilities utilized by children and the community), recreational uses (parks and recreational clubs), and open space.

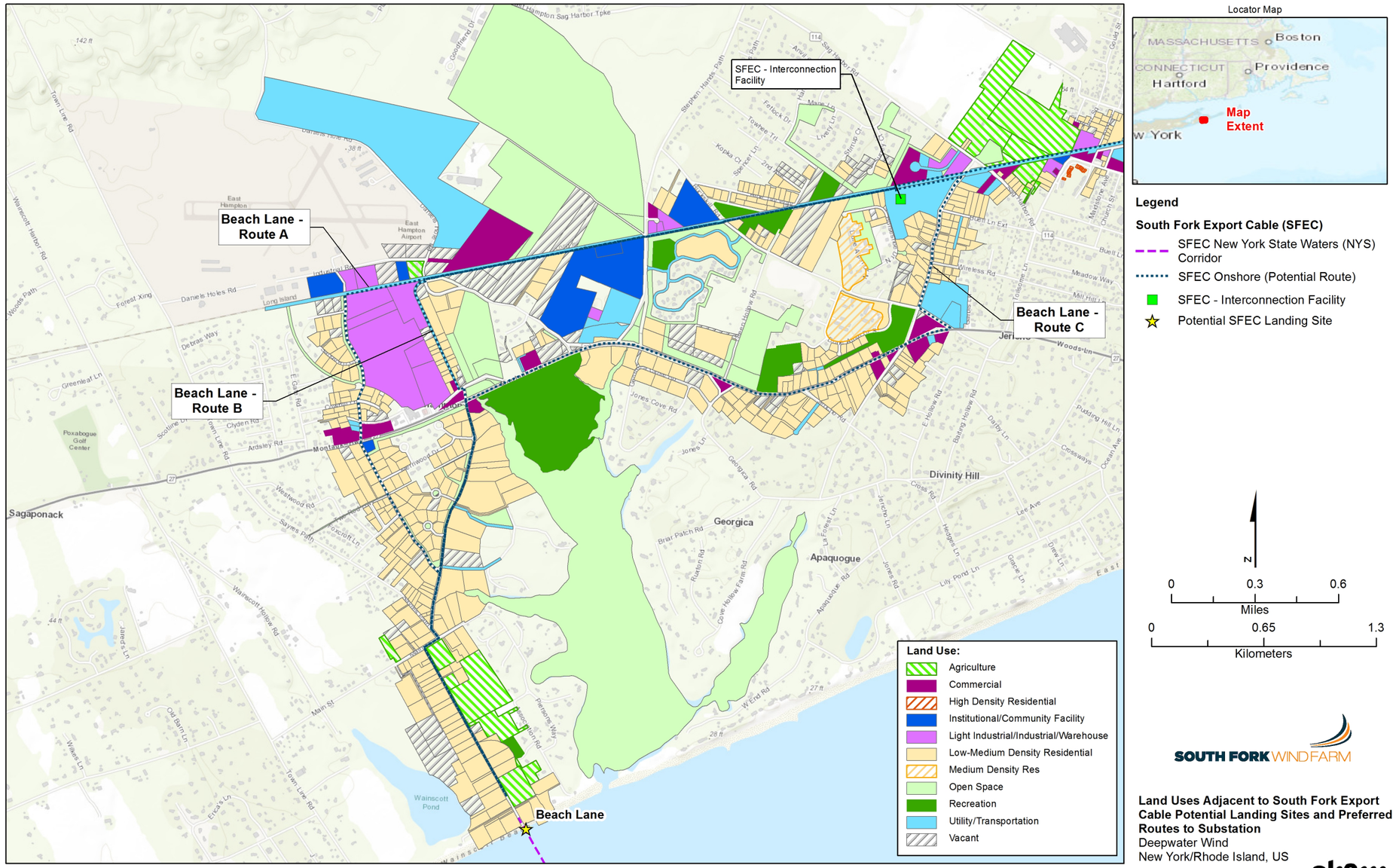
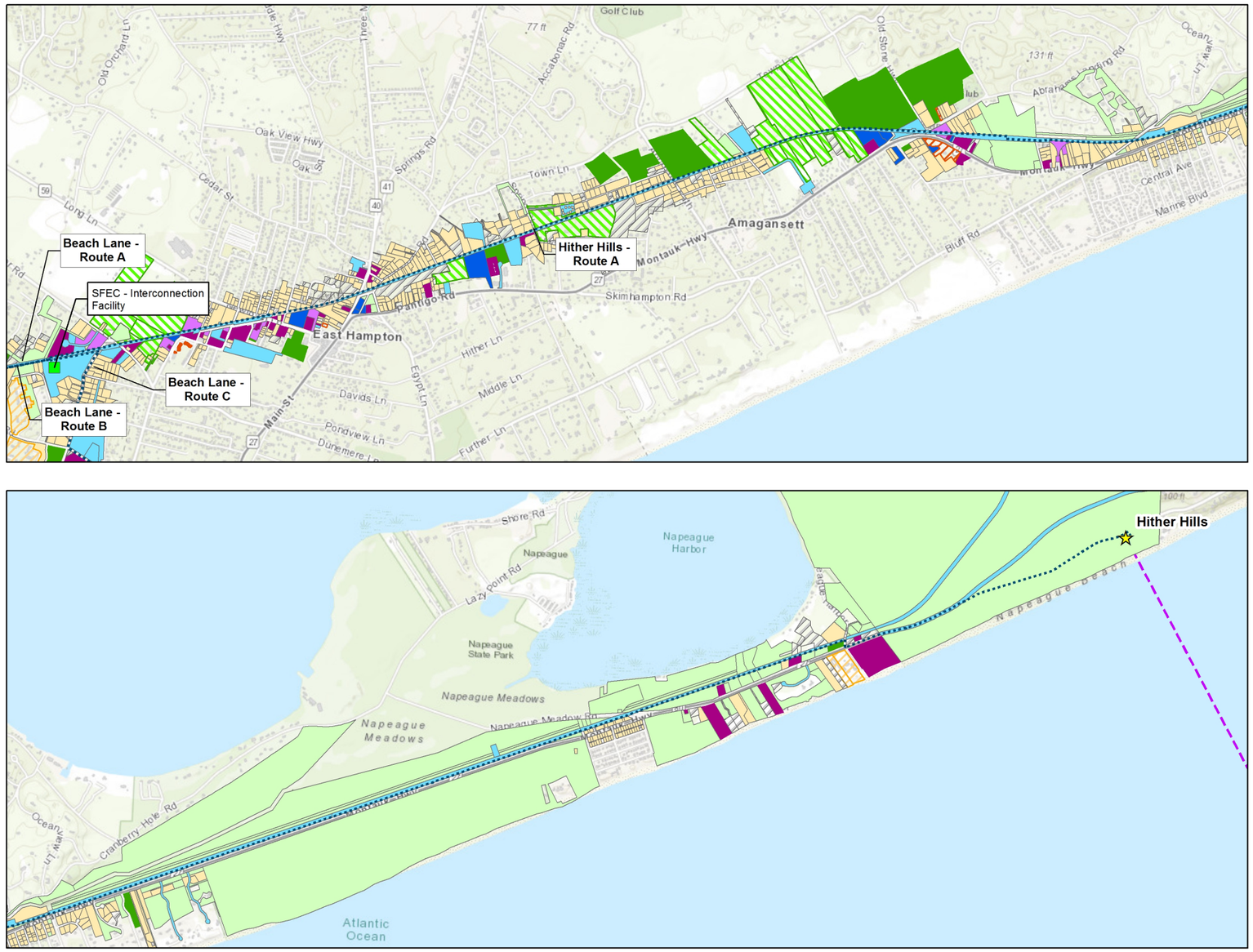



**Figure 4.6-7. Existing Land Uses at Beach Lane Landing Site and along the SFEC – Onshore Route**




Locator Map


**Legend**

**South Fork Export Cable (SFEC)**

- SFEC New York State Waters (NYS) Corridor
- SFEC Onshore (Potential Route)
- SFEC - Interconnection Facility
- Potential SFEC Landing Site

**Land Use:**

- Commercial
- Low-Medium Density Residential
- Medium Density Res
- Open Space
- Recreation
- Utility/Transportation
- Vacant

N

0 0.5 1
Miles

0 1 2
Kilometers

SOUTH FORK WIND FARM

**Land Uses Adjacent to South Fork Export Cable Potential Landing Sites and Preferred Routes to Substation**
Deepwater Wind
New York/Rhode Island, US

ch2m.

DVR \\brooksidefiles\GIS_SHARE\ENBG\00_Proj\D\DeepwaterWind\Maps\SFWF\COP\General\20180611_SFWF_COP_OnshoreLanduseHH.mxd mcotterb 6/27/2018 10:07:00 AM

**Figure 4.6-8. Existing Land Uses at Hither Hills Landing Site and along the SFEC – Onshore Route**

### 4.6.7.2 Potential Impacts

The IPFs associated with the construction, O&M, and decommissioning phases for the SFWF and SFEC are defined in Section 4.1 and illustrated in Figure 4.6-9.

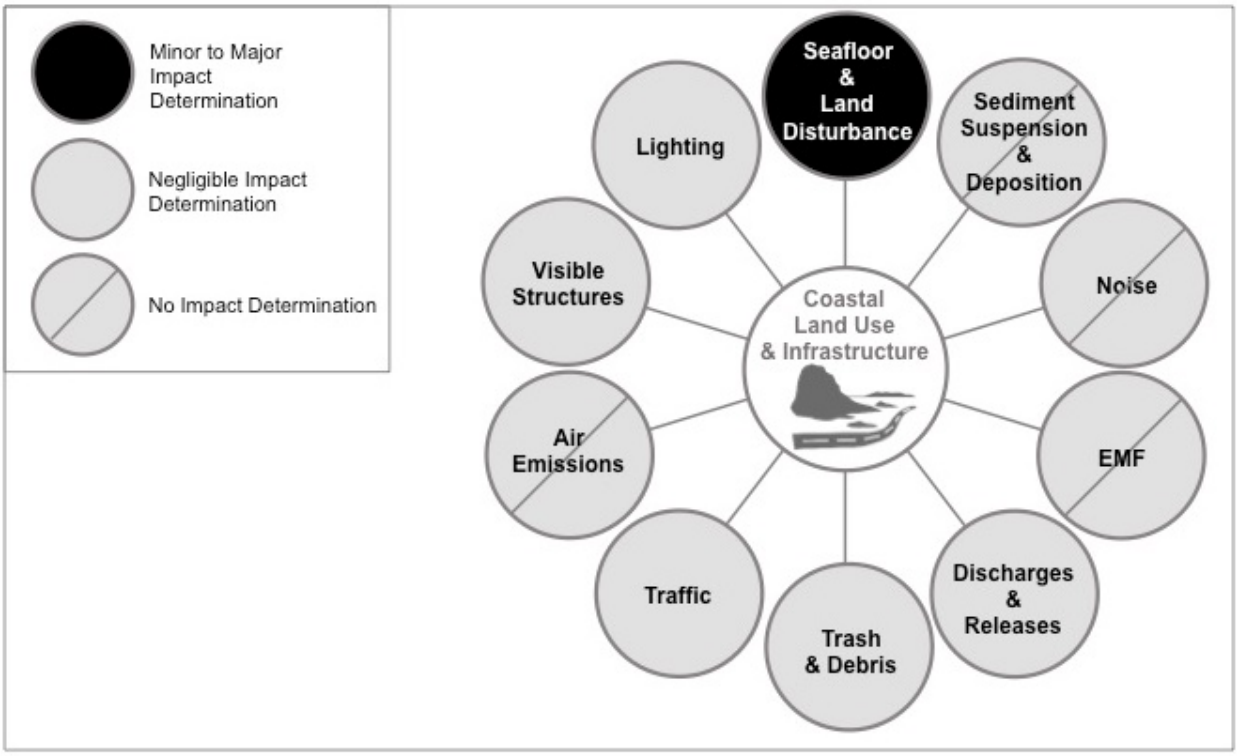



**Figure 4.6-9. Coastal Land Use and Infrastructure Impact-producing Factors**

#### South Fork Wind Farm

The SFWF is not expected to have major long-term impacts on coastal land use and infrastructure. Impacts are expected to be ***negligible to minor, localized,*** and ***short-term,*** with the exception of permanent infrastructure placement.

**Construction**

Some SFWF construction, staging, and fabrication activities, particularly for WTG and OSS foundations, may occur at regional ports (Section 3.1.3.1). Port upgrades may include building construction (i.e., O&M facility), reinforcement of quayside load-bearing capacity, changes to surface materials, and reinforcement and upgrade of docks and landing ramps with the installation of supporting infrastructure, such as lighting, electricity, water, fencing, and/or a security booth. Ports that may support crew transfer, cargo logistics, and storage are not generally anticipated to need upgrades.

**Land Disturbance**

The construction of the SFWF will require the use of onshore ancillary facilities for component assembly or support facilities. Existing port facilities were identified as potential construction support and O&M areas to minimize land use impacts and capitalize on existing infrastructure. Project usage of ports as described in Section 3.1.3.1 will be located at one or more existing industrial or commercial sites limiting the need for new facilities. Because SFWF activities at these sites are consistent with the existing uses in those areas, ***negligible, direct impacts*** to

coastal land use and infrastructure from construction of onshore facilities are anticipated. At ports where upgrades are deemed necessary, there could be ***minor, long-term impacts*** to the land use and infrastructure repairs and upgrades but uses of the facilities would be consistent with current use. If improvements are made to existing port facilities then minor but long-term benefits to local infrastructure may occur.

**Traffic**
Section 4.1.7 discusses marine vessel and land traffic that could be generated by the SFWF construction. Increased marine vessel and vehicular traffic at port facilities during SFWF construction will result in ***negligible*** to ***minor impacts*** relative to existing traffic conditions at those ports but would be relatively ***short-term*** in duration. Therefore, traffic impacts on existing infrastructure during construction are expected to be ***short-term*** and ***negligible***.

**Visible Structures**
There could be **short-term, *negligible impacts*** to other coastal land uses from Project-related visible structures during construction. These impacts would be localized and limited to the ports used to fabricate the optional GBS foundations and for the establishment of the SFWF O&M facility in Montauk or Quonset Point. Despite incremental changes to visible coastal infrastructure during the SFWF, construction will be consistent with existing land uses and lighting in these ports.

### *Operations and Maintenance*

***No impacts*** to coastal land use and infrastructure are anticipated during O&M of the SFWF. The SFWF O&M facility will be in an existing developed area and will be consistent with existing land uses.

### *Decommissioning*

Potential impacts to coastal land use and infrastructure during decommissioning of the SFWF would be similar to those described for construction activities, if removal of Project components occurs with the use of similar equipment and methods.

## SFEC – OCS and SFEC – NYS

### *Construction*

***No impacts*** to coastal land use and infrastructure are anticipated during construction of the SFEC – OCS and SFEC – NYS. However, the same potential impacts related to port activities described for the SFWF apply to SFEC construction.

### *Operations and Maintenance*

***No impacts*** to coastal land use and infrastructure are anticipated during O&M of the SFEC – OCS and SFEC – NYS.

### *Decommissioning*

***No impacts*** to coastal land use and infrastructure are expected during decommissioning of the SFEC – OCS and SFEC – NYS.

## SFEC Onshore

### *Construction*

**Land Disturbance**

The SFEC – Onshore will be constructed entirely underground within existing county, town, and LIRR road and railroad ROW, respectively. Therefore, construction-related land disturbance of the SFEC – Onshore is expected to have ***negligible*** and ***short-term impacts*** to current land uses within, adjacent, or proximate to the SFEC – Onshore cable routes.

The SFEC – Interconnection Facility will be constructed on leased private land, on the same parcel as the existing LIPA substation in the town of East Hampton's Commercial Industrial zoning district. The construction of the SFEC – Interconnection Facility will enlarge an approximately 18-acre (7.28-ha) parcel comprised of woodland and the existing 69 kV LIPA substation currently zoned for a utility land use. ***Minor*** and ***short-term impacts*** would result from the construction of the SFEC – Interconnection Facility.

**Traffic**

Impacts to local roadways and railroads are anticipated to be ***short-term*** and ***localized*** during construction of the sea-to-shore transition vault at either landing site and along the SFEC – Onshore routes to the SFEC – Interconnection Facility. It is expected that there would be short-term and localized increases in truck and construction equipment traffic on area roadways and along the LIRR ROW during construction and decommissioning phases. Periodic traffic restrictions will be in place for public and Project worker safety reasons but impacts on transportation are not expected to be permanent and result in changes to roadways and the railroad. ***Short-term, negligible impacts*** to existing transportation land uses and infrastructure are expected as the result of the SFEC – Onshore construction and decommissioning.

**Visible Structures**

As indicated by the viewshed analysis for the SFEC – Interconnection Facility (Appendix U), the physical presence of the SFEC – Interconnection Facility would result in ***long-term, negligible impacts*** from the new infrastructure introduced to the area. The new interconnection facility replaces a wooded area. However, the addition of the SFEC – Interconnection Facility is consistent with surrounding land uses and would not constitute an incongruous alteration in local land use patterns. As a result, construction of the SFEC – Interconnection Facility is not anticipated to result in significant changes to the existing visual character or scenic quality of the area.

### *Operations and Maintenance*

**Land Disturbance**

Operation and maintenance of the SFEC – Onshore would not alter established land uses. Because the SFEC – Onshore cable will be located entirely underground, no ongoing land disturbance is expected. The SFEC – Onshore would not impact present or future planned uses.

Operation of the SFEC – Interconnection Facility will be consistent with the existing land use at the East Hampton Substation and is not anticipated to adversely impact land uses in the area because operation will be within the existing property already zoned for utility land use. In addition, land uses surrounding the SFEC – Onshore route, north of the East Hampton Substation, consist of light industrial uses and the SFEC – Interconnection Facility will be consistent with these uses. Therefore, O&M-related land disturbance for the SFEC – Onshore is expected to have ***no impacts*** to current land uses within, adjacent, or proximate to the SFEC – Onshore.

**Traffic**
During SFEC O&M, ***negligible, short-term impacts*** to the local transportation system would result if maintenance is required and the underground cable must be exposed. But, once inspection or maintenance is completed, no impacts to infrastructure would be expected.

**Visible Structures**
The only visible structure is the SFEC – Interconnection Facility. The presence of the SFEC – Interconnection Facility will not alter surrounding land uses but will add to the existing 69 kV LIPA substation and utility uses of the immediate area (Appendix U). Therefore, the visible presence of the SFEC – Interconnection Facility is expected to have ***negligible impacts*** to current land uses within, adjacent, or proximate to the existing LIPA onshore substation.

***Decommissioning***

Potential impacts to coastal land use and infrastructure during decommissioning of the SFEC would be similar to those described for construction activities.

#### 4.6.7.3 Proposed Environmental Protection Measures

Several environmental protection measures will reduce potential impacts to coastal land use and infrastructure.

- SFEC - Onshore will be located underground in previously disturbed areas, such as roadways and railroad ROW.
- The SFEC sea-to-shore transition will be installed via HDD to avoid impacts to the dunes, beach, and near-shore zone. New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.
- DWSF will also coordinate with local authorities during SFEC - onshore construction to minimize local traffic and noise impacts.
- An SWPPP, including erosion and sedimentation control measures, and a Spill Prevention, Control, and Countermeasures Plan, will minimize potential impacts to adjacent lands uses during construction of the SFEC - Onshore.

## 4.6.8 Other Marine Uses

The potential for the SFWF and SFEC to impact other marine uses was evaluated based on identification of potential sources of Project-related routine and nonroutine activities and uses in the marine environment, and activities that could impact those uses (see Section 4.1, Summary of Impact-producing Factors). Other marine uses within the potentially affected environment are described in the following subsections, followed by an evaluation of potential Project-related impacts.

#### 4.6.8.1 Affected Environment

This section describes the military (U.S. Navy), public, commercial, and recreational marine uses within the general vicinity of the lease area, the SFWF, and SFEC not previously described in Section 4.6.4, Recreation and Tourism; Section 4.6.5, Commercial and Recreational Fishing; and Section 4.6.6, Commercial Shipping. It characterizes these resources to provide a baseline to compare against proposed construction, O&M and decommissioning activities associated with the SFWF and SFEC.

### Regional Overview

The location of the RI-MA WEA was selected based on extensive pre-screening conducted by BOEM (*see* Section 2 for a discussion regarding the evolution of the current lease area). One of the primary objectives of the pre-screening was to minimize conflicts with other marine uses. The screening utilized the wide array of data sources and marine spatial planning completed by both state governments and BOEM, including the OSAMP and the Massachusetts Ocean Management Plan. In addition, BOEM conducted extensive stakeholder outreach and public meetings to further define potential conflicts with other marine uses.

In addition, BOEM's NEPA review for the lease issuance included analysis of several geographic alternatives for the location of each WEA, and evaluated these alternatives through an Environmental Assessment (BOEM, 2013). This NEPA review included further opportunity for public comment on the RI-MA WEA locations.

In general, the WEA area (Rhode Island Sound and surrounding waters, including Block Island Sound, and portions of Buzzards Bay, Long Island Sound, Nantucket Sound, and Narragansett Bay), are used for a wide range of commercial, military, and recreational activities. Commercial and recreational marine uses in the region include sailing, power boating, parasailing, sportfishing, marine wreck diving, and wildlife viewing (bird, dolphins, sharks, and whales) (INSPIRE and SeaPlan, 2016; RICRMC, 2010; BOEM, 2013; INSPIRE, 2017). Recreational use generally peaks in the summer.

Military uses (U.S. Navy and other services, including Homeland Security [USCG]) in the region are largely because of the proximity to Naval Station Newport, Newport Naval Undersea Warfare Center (Rhode Island), Naval Submarine Base New London, and USCG Academy (New London) (BOEM, 2013; RICRMC, 2010). The U.S. Atlantic Fleet conducts training and testing exercises in the Narraganset Bay OPAREA, as the Newport Naval Undersea Warfare Center routinely performs testing in the area (BOEM, 2013).

Several databases were researched to identify marine uses located within the SFWF and SFEC. The databases included NOAA nautical charts for the region and GIS websites published by the Northeast Ocean Data Portal Collaborative, the Mid-Atlantic Regional Council on the Ocean, and an interagency partnership between NOAA and BOEM. Marine uses investigated included ATONs, alternative energy facilities, anchorage areas, artificial reefs, passenger ferry routes, high-frequency (HF) radar locations, ocean disposal sites, pilot boarding areas, existing submarine cables and other cable areas, and unexploded ordnance (UXO). The proximity of these marine uses to the SFWF and SFEC are shown on Figure 4.6-10 and listed in Tables 4.6-33 and 4.6-34.

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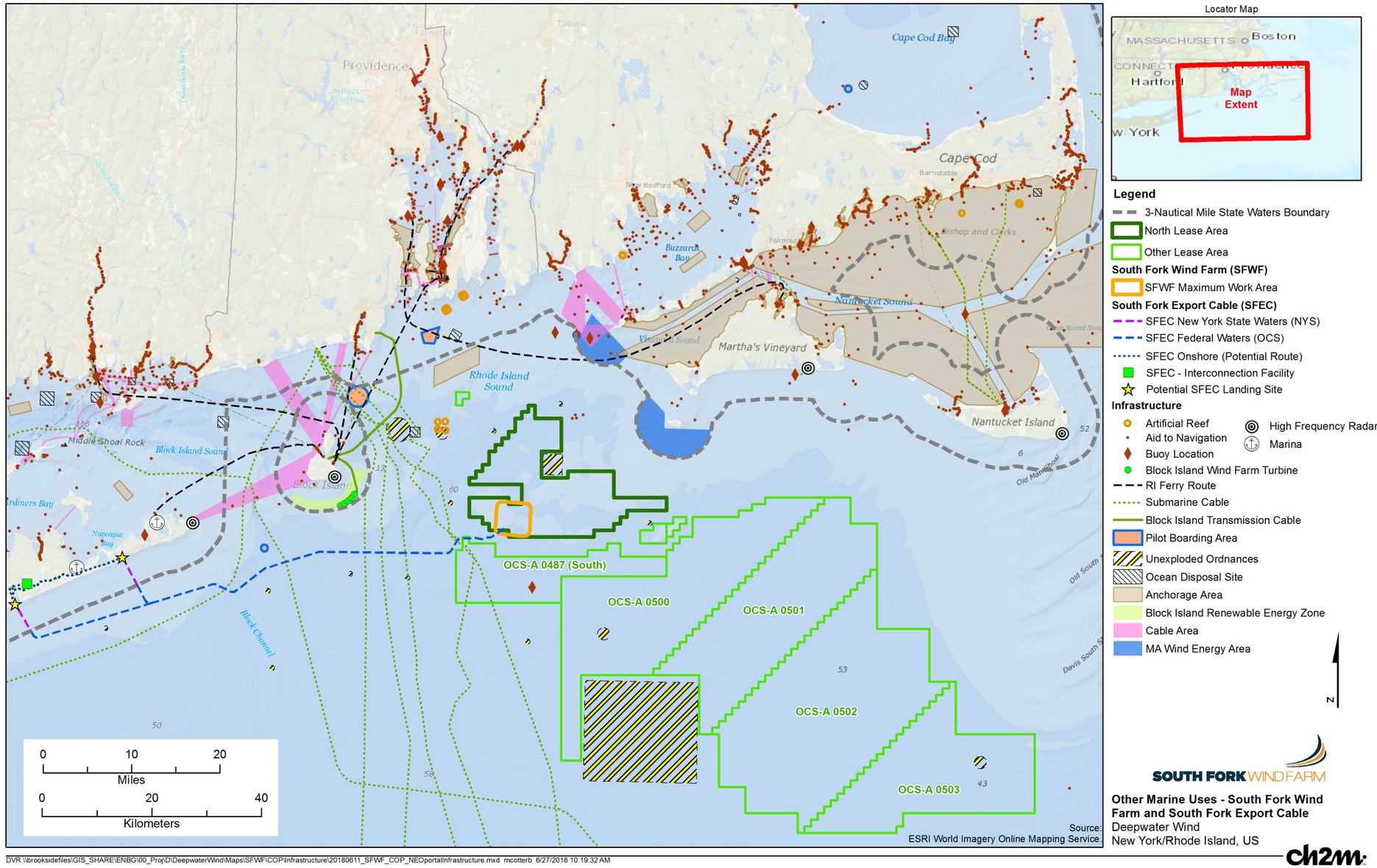


**Figure 4.6-10. Other Marine Uses - South Fork Wind Farm and South Fork Export Cable**

### *Aids to Navigation*

The ATONs are structures intended to assist a navigator in determining position or safe course, or to warn of dangers or obstructions to navigation. This data set includes lights, signals, buoys, day beacons, and other ATONs. The ATONs in the region and near the SFWF and SFEC are shown on Figure 4.6-10 and listed in Table 4.6-32.

### *Alternative Energy Facilities*

The BIWF, a 30-MW offshore wind farm located approximately 3 miles (5 km) southeast of Block Island, is the only active alternative energy facility in the region. There are several other lease areas in the region that are expected to support production and transmission of alternative energy within the next decade. The locations of the alternative energy facility and the lease areas are shown in Figure 4.6-10 and listed in Tables 4.6-33 and 4.6-34.

### *Anchorage Areas*

An anchorage area is a location at sea where vessels can lower their anchors and moor the vessel. The locations usually have conditions for safe anchorage, providing protection from poor weather conditions and other hazards. They can also be used as a mooring area for vessels waiting to enter a port or for the short-term staging area for barges containing construction materials. The two anchorage areas near the SFWF and SFEC are illustrated on Figure 4.6-10. The Brenton Point Anchorage is the closest anchorage site to the SFWF and SFEC. Gardiners Island Anchorage is the only anchorage area within New York State waters. This anchorage area is located approximately 5 miles (8 km) northwest of Montauk Point, east of Gardiners Island.

### *Artificial Reefs*

The artificial reefs near the SFWF and SFEC are generally created from obsolete materials, such as small steel boats and other marine vessels, surplus armored vehicles, tires, and concrete pipes, and are used to provide critical habitat for numerous species of fish in areas devoid of hard-bottom (BOEM, 2013). The artificial reefs located in the region and near the SFWF and SFEC are shown on Figure 4.6-10 and listed in Table 4.6-32.

### *Passenger Ferry Routes*

There are several passenger ferry services in the SFWF and SFEC that provide regular and seasonal transportation to Long Island, Block Island, Martha's Vineyard, and Nantucket. As shown on Figure 4.6-10 and listed in Table 4.6-32, the passenger ferry service routes are initiated in either New York, Connecticut, Rhode Island, or Massachusetts. None of the ferry routes intersect with the SFWF or the SFEC. However, they do cross potential routes of materials and support vessels traveling from ports to the SFWF or SFEC. Passenger ferry in the SFWF and SFEC are also discussed in Section 4.6.4, Recreation and Tourism.

### *High-Frequency Radar Locations*

Preliminary modeling results and studies from Europe incorporating typical offshore wind farm configurations have indicated that wind turbines may have a negative impact on HF radar systems. Presently, however, there are no proposed metrics to develop specific mitigation measures to address HF radar interference. Further research and coordination between HF radar operators and offshore wind energy developers are needed before and after wind turbine installation to accurately investigate and mitigate potential radar interference by wind turbines

and to establish standard mitigation measures that may be employed for wind turbine siting within the range of HF radar network (Ling et al., 2013).

Although not in the direct vicinity of the SFWF and SFEC, there are three civilian-operated HF radar stations in the region. The HF radar stations are shown on Figure 4.6-10 and listed in Table 4.6-32.

***Ocean Disposal Sites***

As shown in Figure 4.6-10, there are several ocean disposal sites in the region. The Rhode Island Sound Disposal Site listed in Tables 4.6-33 and 4.6-34 is the nearest ocean disposal site to the SFWF and SFEC.

***Pilot Boarding Areas***

Pilot boarding areas are locations at sea where pilots who are familiar with local waters board incoming vessels to navigate their passage to a destination port. Pilotage is required by law for foreign vessels and U.S. vessels under register in foreign trade with specific draft characteristics. Pilot boarding areas are represented by a 0.5-nautical-mile (0.9-km) radius around a coordinate point unless the coast pilot specifically designates a different radius or boarding area boundary. Pilot boarding areas in the region and near the SFWF and SFEC are illustrated on Figure 4.6-10.

***Submarine Cables and Cable Areas***

There are seven existing submarine cables that run through OCS waters between the SFWF and Long Island, as illustrated in Figure 4.6-10 and listed in Table 4.6-33. Three of these submarine cables are active, while the other four are considered to be inactive. It is anticipated that the SFEC will intersect with the seven submarine cables in OCS waters and not within New York State waters. In addition, there are NOAA nautical chart cable areas shown on Figure 4.6.8-1; however, these areas do not necessarily mean that actual cables are present there (BOEM, 2013; Appendix H).

***Unexploded Ordnance***

As noted, the U.S. Atlantic Fleet conducts training and testing exercises in the Narraganset Bay OPAREA, which includes Rhode Island and Block Island Sounds. In the past, the Navy established testing ranges for torpedo, depth charge, and mine testing in these waters. Today, UXO is a historically significant component of the seafloor landscape of these sounds. UXO is explosive weapons (e.g., bombs, bullets, shells, grenades, mines, torpedoes) that did not explode when they were deployed and still pose a risk of detonation. As shown on Figure 4.6-10 and listed in Tables 4.6-33 and 4.6-34, there are approximately 15 locations within the OCS waters and Rhode Island Sound waters where UXO disposal locations have been identified, with approximately seven of the UXO sites within 6 nm (11 km) of the RI-MA WEA (BOEM, 2013; Appendix H). These UXOs may include depth charges, bombs, general ordnances, and a submerged torpedo. Construction and decommissioning of the WTGs, inter-array cables, and submarine export cable will likely avoid UXO sites shown on Figure 4.6-10 because they are not directly located within the SFWF or SFEC alignment. However, real time magnetometer surveys during construction, O&M, and decommissioning phases could further reduce risk from UXOs.

**South Fork Wind Farm**

As shown in Figure 4.6-10 and discussed, no other marine uses are identified within the SFWF. However, there is a wide array of other commercial, military, and recreational marine uses

identified near the SFWF. The other marine uses that are near the SFWF are presented in Table 4.6-32.

**Table 4.6-32. Other Marine Uses Near the SFWF**

| Marine Use Type | Specific Details | Approximate Distance and Direction from the SFWF |
|---|---|---|
| ATON | USACE Block Island Lighted Research Buoy 154 | 6 miles (10 km) southeast |
| Alternative Energy Facilities | BIWF | 12 miles (19 km) northwest |
| | Commercial Lease OCS-A 0487 | 2 miles (3 km) south |
| | Commercial Lease OCS-A 0500 | 7 miles (11 km) southeast |
| | Commercial Lease OCS-A 0501 | 21 miles (33 km) southeast |
| | Commercial Lease OCS-A 0502 | 30 miles (48 km) southeast |
| | Commercial Lease OCS-A 0503 | 45 miles (72 km) southeast |
| Anchorage Areas | Brenton Point Anchorage Area is located within Rhode Island Sound | 18 miles (29 km) north |
| Artificial Reefs | Located within Rhode Island Sound | 9 miles (15 km) northwest |
| Passenger Ferry Routes | Connects Montauk, New York, to New Harbor, Block Island in approximately 1 hour by high-speed ferry and offers six trips a day during the peak season. | 10 miles (16 km) northwest |
| | Connects Montauk, New York, to Martha's Vineyard, Massachusetts by a high-speed ferry. The ferry only offers a few trips a week. | 7 miles (11 km) north |
| | Connects Montauk, New York, to Martha's Vineyard, Massachusetts by a high-speed ferry. The ferry only offers a few trips a week. | 37 miles (59 km) northwest |
| HF Radar | HF radar on Block Island, Rhode Island (two radars operated by University of Rhode Island and Rutgers University) | 25 miles (40 km) east/northeast |
| | HF radar on Martha's Vineyard, Massachusetts (operated by Rutgers University) | 40 miles (64 km) east |
| | HF radar on Nantucket Island, Massachusetts (operated by Rutgers University) | 12 miles (19 km) northwest |
| Ocean Disposal Sites | Rhode Island Sound Disposal Site | 6 miles (9 km) northwest |
| UXO Sites | Six sites in OCS waters within Rhode Island Sound east of Block Island and nine sites in OCS waters south | Nearest two sites are 3 miles (5 km) west and 6 miles (10 km) northeast |

### South Fork Export Cable

The SFEC – OCS extends from the SFWF to the 3-mile (4.8 km) territorial waters limit and from there the SFEC – NYS extends to the landing site in East Hampton along the south coast of Long

Island, New York on the Atlantic Ocean. As shown in Figure 4.6-10 and as discussed, there is a wide array of other commercial, military, and recreational marine uses identified near the SFEC – OCS. There are no other marine uses near the SFEC – NYS. The other marine uses that are near the SFEC – OCS are presented in Table 4.6-33.

**Table 4.6-33. Other Marine Uses Near the SFEC – OCS**

| Marine Use Type | Specific Details | Approximate Distance and Direction from the SFEC – OCS |
|---|---|---|
| Alternative Energy Facilities | BIWF | 12 miles (19 km) northwest |
| | Commercial Lease OCS-A 0487 | 2 miles (3 km) south |
| | Commercial Lease OCS-A 0500 | 7 miles (11 km) southeast |
| | Commercial Lease OCS-A 0501 | 21 miles (33 km) southeast |
| | Commercial Lease OCS-A 0502 | 30 miles (48 km) southeast |
| | Commercial Lease OCS-A 0503 | 45 miles (72 km) southeast |
| Passenger Ferry Routes | Connects Montauk, New York, to New Harbor, Block Island in approximately 1 hour by high-speed ferry and offers six trips a day during the peak season. | 5 miles (8 km) north |
| | Connects Montauk, New York, to Martha's Vineyard, Massachusetts by a high-speed ferry. The ferry only offers a few trips a week. | 9 miles (15 km) north |
| | Connects Montauk, New York, to Martha's Vineyard, Massachusetts by a high-speed ferry. The ferry only offers a few trips a week. | 9 miles (15 km) north |
| Ocean Disposal Sites | Rhode Island Sound Disposal Site | 20 miles (32 km) north |
| Pilot Boarding Areas | Point Judith Pilot Station | 27 miles (43 km) north |
| | Montauk Point Pilot Station | 3 miles (4.8 km) north |
| Submarine Cables and Cable Areas | Intersection with seven cables (three active and four inactive) along export cable route in OCS waters. | Intersections occur at seven different locations along the SFEC - OCS. |
| Unexploded Ordnance Sites | Six sites in OCS waters within Rhode Island Sound, east of Block Island and nine sites in OCS waters south. | Four nearest sites are within 5 miles (5 km) south and 6 miles (10 km) north of the SFEC. |

### 4.6.8.2 Potential Impacts

Project-related IPFs that could potentially result in impacts to other marine uses during the construction, O&M, and decommissioning phases of the SFWF and SFEC are described in this section. Impacts to other marine industries and activities are addressed in Section 4.6.4 (Recreation and Tourism), Section 4.6.5 (Commercial and Recreational Fishing), and Section

4.6.6 (Commercial Shipping). The IPFs that are discussed in this section that may impact other marine uses are traffic and visible structures. IPFs like, seafloor disturbances, discharges and releases, trash and debris could have indirect impacts on some of the other marine uses included in this chapter but given the lack of direct impact with Project activities, these IPFs are dismissed as no impact for the remainder of this discussion. A summary of IPFs and the potential impacts to other marine uses associated with the SFWF and SFEC is presented in Figure 4.6-11.

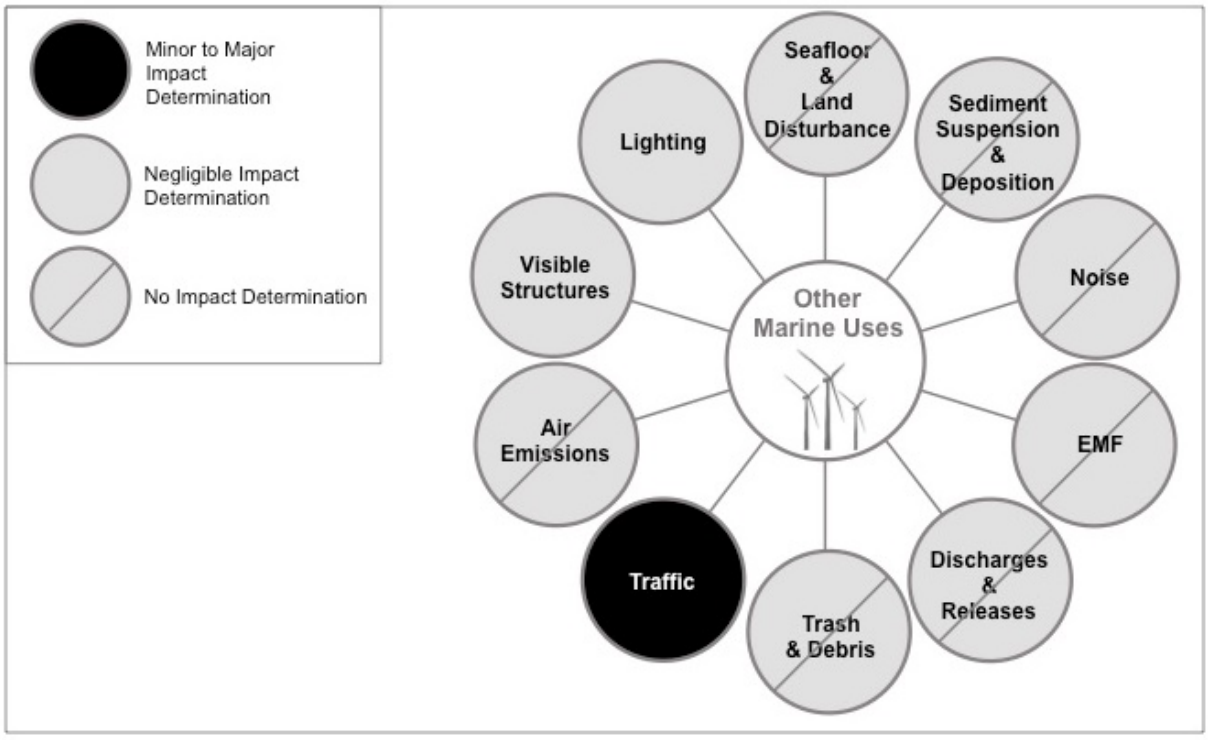


**Figure 4.6-11. Impact-producing factors from Other Marine Uses**

## South Fork Wind Farm

### *Construction*

#### Traffic

Project-related vessel traffic impacts on commercial shipping was discussed in the previous section. Anticipated impacts to other marine uses, such as passenger ferry service or military operations, from SFWF construction vessel traffic are anticipated to be ***minor, short-term and localized***. For instance, depending on the ports of origin and destination, time of year, and time of day, SFWF vessel traffic may cross and impact passenger ferry service routes between Rhode Island and Massachusetts, and possibly routes between New York and Connecticut. Although SFWF marine vessels and passenger ferry routes may overlap during all Project phases, vessel traffic will be the greatest during the construction phase. Therefore, potential impacts to passenger ferry during the construction phase are anticipated to be the highest. There may be localized areas where re-routing the ferry routes is necessary, but there are no long-term or major impacts on ferry routes expected from construction, especially if conducted offseason when there

are less ferry crossings. Timely communication and notices will be issued to mariners informing them of construction activities and areas designated as off-limits.

### *Operations and Maintenance*

**Traffic**
During the SFWF O&M phase, minimal vessel traffic is anticipated; therefore, impacts to other marine uses from vessel traffic and visible structures are expected to be ***negligible***.

**Visible Structures**
The WTGs and OSS visible structures are expected to have an impact because there would be some displacement to other marine uses in the specific location of the SFWF. However, given that no other marine uses are identified within the SFWF, impacts are expected to be ***negligible*** but ***long-term*** because they exist so long as the SFWF WTGs are present.

Also, the presence of the WTGs for the duration of the O&M phase may interfere with the operation of the three HF radar stations in the region. However, there is no conclusive information to determine the extent of those impacts or potential mitigation measures for optimizing operations. Given there is now operational offshore wind turbines at the BIWF, BOEM has initiated an ongoing study through the Office of Renewable Energy Programs Environmental Studies Program that will assess the impact of offshore wind farms to the U.S. HF Radar Network (BOEM, 2016). The objectives of the BOEM study are to understand the impacts offshore wind turbines have on the operation of HF radars, develop algorithmic mitigation methods, and determine the effectiveness of mitigation methods.

### *Decommissioning*

Potential impacts to other marine uses during decommissioning of the SFWF would be similar to those described above for construction activities assuming that SFWF Project components are removed using similar vessels, equipment, and methods.

## SFEC – OCS

### *Construction*

**Traffic**
Construction vessel traffic could result in similar impacts to passenger ferry service and military operations as described under the SFWF. Installation of the SFEC by mechanical/hydro-jet plow will cross seven existing submarine cables.

**Visible Structures**
Crossing of existing and operational telecommunication cables poses the risk of damage to these existing facilities during SFEC installation. However, the DWSF has coordinated with the cable owners to identify methods to cross and these cables in agreement by the cable owners that will mitigate risk of damage (Appendix F). Once installed, the SFEC will not be visible or interfere with the operation of the existing, functioning cables because of the shielded construction of the SFEC cable itself. Therefore, ***short-term, localized and negligible impacts*** to existing submarine cables are anticipated.

***Operations and Maintenance***

***No impacts*** are expected during O&M unless there is a failure or malfunction of the SFEC – OCS requiring exposure and repair of the cable. In this nonroutine, infrequent situation, the impacts to other marine uses would be expected to ***negligible, short-term,*** and ***localized***.

**Traffic**
Impacts associated with traffic during O&M are expected to be similar to, but less frequent than, those discussed in the construction phase.

**Visible Structures**
***Negligible impacts*** are expected during the O&M of the SFEC - OCS to the existing submarine cables at the points of crossing. Any SFEC repairs near the crossings will need to be conducted in agreement with existing submarine cable owners.

***Decommissioning***

Potential impacts to other marine uses during decommissioning of the SFWF would be similar to those described above for construction activities in the event the SFEC – OCS is removed by similar vessels, equipment, and methods

***SFEC – NYS Waters***

There are no other marine use conflicts because there were no other marine uses identified in the SFEC – NYS that have not already been addressed in other sections (i.e., Section 4.6.4, Recreation and Tourism; Section 4.6.5, Commercial and Recreational Fishing; and Section 4.6.6, Commercial Shipping).

***SFEC – Onshore***

There are no other marine use conflicts because there were no other marine uses identified in the SFEC – Onshore that have not already been addressed in other sections (i.e., Section 4.6.4, Recreation and Tourism and Section 4.6.7, Coastal Land Use and Infrastructure).

#### 4.6.8.3 Proposed Environmental Protection Measures

Similar to the environmental protection measures discussed in Section 4.6.4, Recreation and Tourism; Section 4.6.5, Commercial and Recreational Fishing; and Section 4.6.6, Commercial Shipping, DWSF will minimize conflicts with the other marine uses described in this section.

## 4.6.9 Environmental Justice

### 4.6.9.1 Affected Environment

EO 12898 requires that federal agencies take steps to identify and address disproportionately high and adverse health or environmental impacts of federal actions on minority and low-income populations as well as populations who principally rely on fish or wildlife for subsistence. According to Council on Environmental Quality (CEQ) environmental justice guidance under NEPA (EPA, 2016), minorities are those groups that include American Indian or Alaskan Native; Asian or Pacific Island; Black, not of Hispanic origin; or Hispanic. Minority or low-income populations are defined where either (a) the population of the impacted area exceeds 50 percent or (b) the population of the impacted area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

### Regional Overview

This section presents the demographic analysis used to determine the presence or absence in minority and low-income populations in the communities noted in the socioeconomic ROI (Table 4.6-1). To do so, the communities, either CDPs or incorporated areas such as cities, are compared to their corresponding county for the purposes of the geographic analysis.

### South Fork Wind Farm and South Fork Export Cable

Poverty status was determined for all people except institutionalized people, people in military group quarters, people in college dormitories, and unrelated individuals under 15 years old. These groups were excluded from the numerator and denominator when calculating poverty rates. Table 4.6-34 summarizes the percentage of state, county, and town populations that will be considered minority or low-income for analysis. Only a limited number of the communities in the socioeconomic ROI have the potential for low income or minority status because of either exceeding 50 percent or being significantly higher than their corresponding county of comparison for this analysis. The following communities, also described in Table 4.6-34, have the potential for environmental justice populations:

- Between 13 and 23 percent of the populations of Montauk and Wainscott CDPs have income below the poverty level as compared 7 percent in Suffolk County. However, these percentages are comparable to the state of New York.
- Twenty-nine percent of the population of the city of Providence has income below the poverty level as compared to 18 percent for Providence County and 14 percent for Rhode Island. The city of Providence's population is 69 percent minority, comparable to that of the county, 67 percent, but significantly higher than Rhode Island's minority percentage of 33 percent.
- The percentage of the city of New Bedford's population with income below the poverty level, 23 percent, is modestly higher than the county and state percentages of 12 to 13 percent. New Bedford's population is 47 percent minority, compared to 20 percent of Bristol County and 31 percent for the Commonwealth of Massachusetts (USCB, 2015f, 2015g, and 2015h).

**Table 4.6-34 2015 Income and Minority Population Levels**

| Entity | Population for whom Poverty is Determined | % of Population | | | |
|---|---|---|---|---|---|
| | | With Income Below Poverty Level | Hispanic or Latino | Minority not Hispanic or Latino | Total Minority |
| ***NEW YORK*** | ***19,164,034*** | ***16%*** | ***18%*** | ***35%*** | ***54%*** |
| *Suffolk County* | 1,471,614 | 7% | 18% | 19% | 37% |
| Town of East Hampton | 21,801 | 9% | 16% | 10% | 25% |
| East Hampton North CDP | 3,979 | 9% | 26% | 7% | 34% |

**Table 4.6-34 2015 Income and Minority Population Levels**

| Entity | Population for whom Poverty is Determined | % of Population | | | |
|---|---|---|---|---|---|
| | | With Income Below Poverty Level | Hispanic or Latino | Minority not Hispanic or Latino | Total Minority |
| Montauk CDP | 3,474 | 13% | 10% | 7% | 17% |
| Wainscott CDP | 731 | 23% | 17% | 5% | 22% |
| ***RHODE ISLAND*** | ***1,013,455*** | ***14%*** | ***14%*** | ***19%*** | ***33%*** |
| *Washington County* | 120,415 | 10% | 3% | 7% | 9% |
| Town of North Kingstown | 26,098 | 9% | 3% | 8% | 11% |
| *Providence County* | 604,585 | 18% | 40% | 27% | 67% |
| City of Providence | 165,268 | 29% | 20% | 49% | 69% |
| ***MASSACHUSETTS*** | ***6,471,313*** | ***12%*** | ***11%*** | ***20%*** | ***31%*** |
| *Bristol County* | 536,309 | 13% | 7% | 13% | 20% |
| City of New Bedford | 93,118 | 23% | 18% | 28% | 47% |

Source: USCB, 2015f, 2015g, and 2015h

### 4.6.9.2 Potential Impacts

As noted in the revised Environmental Assessment for Commercial Wind Lease Issuance and Site Assessment Activities for the RI-MA WEA, the WEA is 10.4 nm (19.3 km) or more from the nearest coastline; thus, offshore Project activities would not have disproportionally high or adverse environmental or health impacts on minority or low-income populations (BOEM, 2013). Only onshore activities associated with the port options, the SFWF O&M facility, and the SFEC – Interconnection Facility would have the potential to impact minority or low-income populations (ESS Group, 2016). However, the potential for impacts is generally low and limited to the ports because of the location of the other onshore Project components and the short duration of the construction activities.

IPFs that could result in short-term or long-term impacts to environmental justice communities are indicated in Figure 4.6-12. The noise, traffic, and visible structures IPFs have potential negligible and greater impacts; thus, are briefly evaluated in this section.

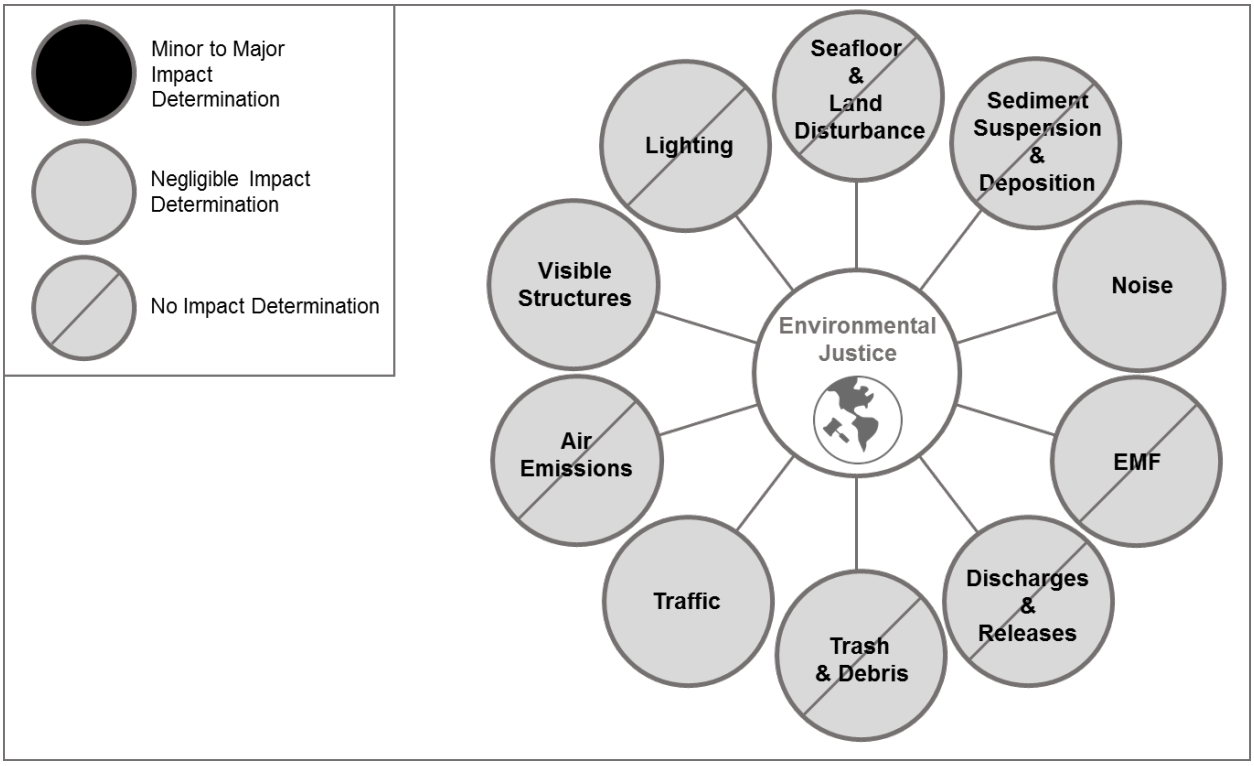


**Figure 4.6-12. Impact-producing Factors on Environmental Justice**

## South Fork Wind Farm

### Noise and Traffic

Most of the construction and decommissioning activities for the SFWF will occur at one of the ports listed in Table 4.6-1. Because of the existing industrial nature and uses of these ports, the relatively short duration of these activities, and Project-specific environmental protection measures, the potential is low for disproportionally high or adverse environmental or health impacts for minority or low-income populations. Therefore, impacts from SFWF are considered ***negligible***.

Operation of the SFWF will require a small full-time, onshore staff at an O&M facility in Suffolk County, New York or North Kingstown, Rhode Island over the anticipated 25+ year operation life of the SFWF. Table 4.6-34 illustrates that there are no environmental justice communities associated with North Kingstown, Rhode Island and only a limited number of low-income residents in Suffolk County, New York. Thus, ***negligible, long-term impacts*** on environmental justice populations are expected because of the SFWF.

## SFEC – OCS and SFEC NYS

Because it will be unpopulated open water, there will be ***no impacts*** to environmental justice from construction, O&M, or decommissioning of the SFEC – OCS and SFEC – NYS.

## SFEC – Onshore

Onshore activities associated with construction, O&M, or decommissioning of the SFEC – OCS and SFEC – NYS would have no impact to environmental justice communities because of the

lack of proximate minority or low-income populations and the short duration of the construction activities.

#### 4.6.9.3 Proposed Environmental Protection Measures

Several environmental protection measures will reduce potential impacts to environmental justice populations that may be identified.

- The use of wind to generate electricity will have a beneficial impact on air emissions in East Hampton, as it reduces the need for electricity generation from traditional fossil fuel powered plants on the South Fork of Long Island that produce greenhouse gas emissions.
- Where possible, local workers will be hired to meet labor needs for Project construction, O&M, and decommissioning.
- New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.
- DWSF will also coordinate with local authorities during SFEC - Onshore construction to minimize local traffic and noise impacts.

## 4.7 Summary of Potential Impacts and Environmental Protection Measures

This section provides a summary of the potential impacts anticipated from the implementation of activities described in this COP and also provides a summary of the proposed environmental protection measures that will be implemented to avoid and minimize these potential impacts. The information presented in Section 4.0 was developed and presented to support review under NEPA and, as appropriate, the ESA, MMPA, Migratory Bird Treaty Act, CZMA, NHPA, and the MSFCMA.

The scopes of the resource characterizations and impact assessments presented in Section 4.0 were based upon the requirements set forth in 30 CFR 585.627 but also guided by input from federal and state agencies and other public and private stakeholders in the region. Physical, biological, cultural, visual, and socioeconomic resources were characterized based upon extensive desktop studies, targeted field studies, predictive modeling, and data analysis. These assessments provided a detailed background on the condition of these resources in the affected environment. Desktop studies included literature reviews; examination of publicly available datasets; direct communication with academic and government science researchers; and consultation with state and federal government entities. The OSAMP, the New York Ocean Plan, and the Massachusetts Ocean Plan provided important insight on environmental conditions and existing human activities in and near the SFWF and SFEC. The resource characterizations also relied on the material published in recent BOEM NEPA documents, such as the Final *Programmatic Environmental Impact Statement (PEIS) for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf* (BOEM, 2007).

As demonstrated by the impact evaluations presented throughout Section 4.0, The type and degree of potential impacts from proposed Project activities varies based on the characteristics of the resource (e.g., presence/absence, conservation status, abundance) and the IPF that may affect each resource. Potential impacts are discussed separately for the SFWF and SFEC. Where

relevant and distinct, potential impacts for different segments of the SFEC are discussed separately. Where applicable, potential impacts were identified as direct or indirect; short-term or long-term; and negligible, minor, moderate, or major. If measures are proposed to avoid and minimize potential impacts, the impact evaluation included consideration of these environmental protection measures.

Table 4.7-1 identifies the resources identified within the affected environment and the potential impacts expected from the implementation of the activities described in this COP. Table 4.7-2 describes the corresponding environmental protection measures that DWSF would adopt to minimize these potential impacts. These tables provide a summary of the information discussed in each resource section throughout Section 4.0.

The Project was sited, planned, and designed to avoid and minimize impacts. Most potential impacts to affected physical, biological, cultural, visual, and socioeconomic resources will be mitigated. Resources that may be impacted by the SFWF and SFEC are expected to recover given that impacts will be limited temporally and/or spatially. Post construction environmental monitoring of various resources will take place and will include, at a minimum, coordination and data sharing with regional monitoring efforts. Monitoring plans will be developed in coordination with the relevant agencies prior to construction.

**Table 4.7-1. Summary of the Evaluation of Impact-producing Factors associated with the South Fork Wind Farm and South Fork Export Cable and Affected Physical, Biological, Cultural and Socioeconomic Resources**

| | Physical Resources | | | | Biological Resources | | | | | | | Cultural Resources | | | | Socioeconomic Resources | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Impact-producing Factor** | **Air Quality** | **Water Quality & Water Resources** | **Geological Resources** | **Physical Oceanography & Meteorology** | **Coastal Habitat** | **Benthic & Shellfish Resources** | **Finfish & Essential Fish Habitat** | **Marine Mammals** | **Sea Turtles** | **Avian Species** | **Bat Species** | **Historic Properties** | **Marine Archaeological Resources** | **Terrestrial Archaeological Resources** | **Visual Resources** | **Population, Economy, & Employment** | **Housing & Property Values** | **Public Services** | **Recreation & Tourism** | **Commercial & Recreational Fishing** | **Commercial Shipping** | **Coastal Land Use & Infrastructure** | **Other Marine Uses** | **Environmental Justice** |
| ***Impact Evaluation Section Number*** | *4.2.1.2* | *4.2.2.2* | *4.2.3.2* | *4.2.4.2* | *4.3.1.2* | *4.3.2.2* | *4.3.3.2* | *4.3.4.2* | *4.3.5.2* | *4.3.6.2* | *4.3.7.2* | *4.4.1.2* | *4.4.2.2* | *4.4.3.2* | *4.5.2* | *4.6.1.2* | *4.6.2.2* | *4.6.3.2* | *4.6.4.2* | *4.6.5.2* | *4.6.6.2* | *4.6.7.2* | *4.6.8.2* | *4.6.9.2* |
| Seafloor and Land Disturbance | | Min | Neg-Min | Neg | Neg | Min | Neg-Min | Neg | Neg–Min | Neg | Neg-Min | | Min-Mod | Min-Mod | | | | | Neg | Min-Mod | | Neg-Min | | |
| Sediment Suspension and Deposition | | Neg-Min | Neg-Min | Neg | Neg | Neg-Min | Neg-Min | Neg | Neg | Neg | | | Neg | | | | | | | Neg | | | | |
| Noise | | | | | | Neg-Min | Neg-Mod | Neg-Maj | Neg-Mod | Neg-Min | Neg | Neg | | | | Neg | Neg | | Neg | Neg-Min | | | | Neg |
| Electromagnetic Field | | | | | | Neg | Neg | Neg | Neg | | | | | | | | | | | Neg | | | | |
| Discharges and Releases | | Neg | | | Neg | Neg | Neg | Neg | Neg | Neg-Min | | | | | | | | | Neg | Neg | | Neg | | |
| Trash and Debris | | Neg | | | Neg | Neg | Neg | Neg | Neg | Neg | | | | | | | | | Neg | Neg | | Neg | | |
| Traffic | | | | | | Neg | Neg-Min | Neg-Mod | Neg-Mod | Neg-Min | Neg | Neg | | | Min | Neg | Neg | Neg. | Neg | Min | Neg-Min | Neg | Neg-Min | Neg |
| Air Emissions | Neg-Min | | | | | | | | | | | | | | | | | | | | | | | |
| Visible Structures | | | | Neg | | | | Neg | Neg | Neg-Min | Neg-Min | Min | | | Min | Neg-Min | Neg | | Neg-Min | Min | Neg | Neg | Neg | Neg |
| Lighting | | | | | | Neg | Neg | Neg | Neg | Neg-Min | Neg-Min | Neg-Min | | | Min | | Neg | | Neg-Min | | Neg | Neg | Neg | |

Notes:
Neg = Negligible
Min = Minor
Mod = Moderate
Maj = Major

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Air Quality | • Seafloor and Land Disturbance: No Impact<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: No Impact<br>• Air Emissions: Negligible – Minor<br>• Visible Structures: No Impact<br>• Lighting: No Impact | • Vessels providing construction or maintenance services for the SFWF will use low sulfur fuel where possible.<br>• Vessels constructed on or after January 1, 2016 will meet Tier III NOx requirements when operating within Emission Controls Areas.<br>• Equipment and fuel suppliers will provide equipment and fuels that comply with the applicable EPA or equivalent emission standards.<br>• Marine engines with a model year of 2007 or later and non-road engines complying with the Tier 3 standards (in 40 CFR 89 or 1039) or better will be used to satisfy BACT.<br>• The use of wind to generate electricity reduces the need for electricity generation from new traditional fossil fuel powered plants on the South Fork of Long Island that produce greenhouse gas emissions. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Water Quality | • Seafloor and Land Disturbance: Minor<br>• Sediment Suspension and Deposition: Negligible – Minor<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: No Impact<br>• Air Emissions: No Impact<br>• Visible Structures: No Impact<br>• Lighting: No Impact | • Installation of the SFWF inter-array cable and SFEC - Offshore will occur via a mechanical/hydro-jet plow. Compared to open cut dredging/trenching, this method will minimize sediment disturbance and alteration and reduce associated turbidity and TSS.<br>• Vessels will comply with regulatory requirements related to the prevention and control of discharges and accidental spills.<br>• Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D to this COP).<br>• At the onshore HDD work area for the SFEC, drilling fluids will be managed within a contained system to be collected for reuse as necessary<br>• An HDD Inadvertent Release Plan will minimize the potential risks associated with release of drilling fluids or a frac-out.<br>• An SWPPP, including erosion and sedimentation control measures, and a Spill Prevention, Control, and Countermeasures Plan, will minimize potential impacts to water quality during construction of the SFEC - Onshore. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Geological Resources | • Seafloor and Land Disturbance: Negligible – Minor<br>• Sediment Suspension and Deposition: Negligible – Minor<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: No Impact<br>• Air Emissions: No Impact<br>• Visible Structures: No Impact<br>• Lighting: No Impact | • The SFWF and SFEC - Offshore will avoid, to the extent practicable, identified shallow hazards.<br>• Installation of the SFWF inter-array cable and SFEC - Offshore will occur via a mechanical/hydro-jet plow. Compared to open cut dredging/trenching, this method will minimize impacts to surficial geology.<br>• Use of DP vessel for cable installation for the SFWF inter-array cable and SFEC - Offshore will minimize impacts to surficial geology, as compared to use of a vessel relying on multiple-anchors.<br>• A plan for vessels will be developed prior to construction to identify no-anchor areas inside the MWA to protect sensitive areas or other areas to be avoided.<br>• The SFEC sea-to-shore transition will be installed via HDD to avoid impacts to the dunes, beach, and near-shore zone. The SFEC - Onshore is sited within previously disturbed existing ROWs. |
| Oceanographic and Meteorological Conditions | • Seafloor and Land Disturbance: Negligible<br>• Sediment Suspension and Deposition: Negligible<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: No Impact<br>• Air Emissions: No Impact<br>• Visible Structures: Negligible<br>• Lighting: No Impact | • DWSF has designed the Project to account for site-specific oceanographic and meteorological conditions within the Project Area; therefore, no additional measures are necessary. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Coastal and Terrestrial Habitat | • Seafloor and Land Disturbance: Negligible<br>• Sediment Suspension and Deposition: Negligible<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: No Impact<br>• Air Emissions: No Impact<br>• Visible Structure: No Impact<br>• Lighting: No Impact | • SFEC - Onshore is sited within previously disturbed existing ROWs.<br>• The SFEC sea-to-shore transition will be installed via HDD to avoid impacts to the dunes, beach, and near-shore zone. Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D to this COP).<br>• An SWPPP, including erosion and sedimentation control measures, and a Spill Prevention, Control, and Countermeasures Plan, will minimize potential impacts to water quality during construction of the SFEC - Onshore. |
| Benthic and Shellfish Resources | • Seafloor and Land Disturbance: Minor<br>• Sediment Suspension and Deposition: Negligible – Minor<br>• Noise: Negligible – Minor<br>• Electromagnetic Field: Negligible<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: Negligible<br>• Air Emissions: No Impact<br>• Visible Structures: No Impact<br>• Lighting: Negligible | • The SFWF and SFEC - Offshore will minimize impacts to harder and rockier bottom habitats to the extent practicable.<br>• Installation of the SFWF inter-array cable and SFEC - Offshore will occur via a mechanical/hydro-jet plow. Compared to open cut dredging/trenching, this method will minimize long-term impacts to the benthic habitat.<br>• The SFWF inter-array cable and SFEC - Offshore will be buried to a target depth of 4 to 6 feet (1.2 to 1.8 m).<br>• Use of HDD for cable installation for the SFWF inter-array cable and SFEC - Offshore will minimize impacts to surficial geology, as compared to use of a vessel relying on multiple-anchors.<br>• A plan for vessels will be developed prior to construction to identify no-anchor areas inside the MWA to protect sensitive areas or other areas to be avoided. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Finfish and Essential Fish Habitat | • Seafloor and Land Disturbance: Negligible – Minor<br>• Sediment Suspension and Deposition: Negligible – Minor<br>• Noise: Negligible – Moderate<br>• Electromagnetic Field: Negligible<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: Negligible – Minor<br>• Air Emissions: No Impact<br>• Visible Structures: No Impact<br>• Lighting: Negligible | • The SFWF and SFEC - Offshore will minimize impacts to important habitats for finfish species.<br>• Installation of the SFWF inter-array cable and SFEC - Offshore will occur via a mechanical/hydro-jet plow. Compared to open cut dredging/trenching, this method will minimize sediment disturbance and alteration of demersal finfish habitat.<br>• The SFWF inter-array cable and SFEC - Offshore will be buried to a target depth of 4 to 6 feet (1.2 to 1.8 m).<br>• Siting of the SFWF and SFEC - Offshore were informed by site-specific benthic habitat assessments and Atlantic cod spawning surveys.<br>• DWSF is committed to collaborative science with the commercial and recreational fishing industries pre-, during, and post-construction.<br>• A plan for vessels will be developed prior to construction to identify no-anchor areas inside the MWA to protect sensitive areas or other areas to be avoided.<br>• DWSF will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.<br>• Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D to this COP). |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Marine Mammals | • Seafloor and Land Disturbance: Negligible<br>• Sediment Suspension and Deposition: Negligible<br>• Noise: Negligible – Major<br>• Electromagnetic Field: Negligible<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: Negligible – Moderate<br>• Air Emissions: No Impact<br>• Visible Structures: Negligible<br>• Lighting: Negligible | • Exclusion and monitoring zones for marine mammals will be established for pile driving and HRG survey activities.<br>• Mitigation measures will be implemented for pile driving and HRG survey activities. These measures will include soft-start measures, shut-down procedures, marine mammal monitoring protocols, and use of qualified and NOAA- approved protected species observers, as appropriate.<br>• Pile driving activities will not occur at the SFWF from November 1 to April 30 to minimize potential impacts to the North Atlantic right whale.<br>• Vessels will follow NOAA guidelines for marine mammal strike avoidance measures, including vessel speed restrictions.<br>• All personnel working offshore will receive training on marine mammal awareness and marine debris awareness.<br>• DWSF will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.<br>• Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D to this COP).<br>• The SFWF inter-array cable and SFEC - Offshore will be buried to a target depth of 4 to 6 feet (1.2 to 1.8 m). |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Sea Turtles | • Seafloor and Land Disturbance: Negligible – Minor<br>• Sediment Suspension and Deposition: Negligible<br>• Noise: Negligible – Moderate<br>• Electromagnetic Field: Negligible<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: Minor – Moderate<br>• Air Emission: No Impact<br>• Visible Structure: Negligible<br>• Lighting: negligible | • Exclusion and monitoring zones will be established for sea turtles during pile driving and HRG survey activities.<br>• Mitigation measures will be implemented for pile driving and HRG survey activities. These measures will include soft-start measures, shut-down procedures, marine mammal monitoring protocols, and use of qualified and NOAA-approved protected species observers, as appropriate.<br>• Vessels will follow NOAA guidelines for sea turtle strike avoidance measures, including vessel speed restrictions.<br>• All personnel working offshore will receive training on sea turtle awareness and marine debris awareness.<br>• DWSF will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.<br>• Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D to this COP).<br>• The SFWF inter-array cable and SFEC - Offshore will be buried to a target depth of 4 to 6 feet (1.2 to 1.8 m). |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Avian Species | • Seafloor and Land Disturbance: Negligible<br>• Sediment Suspension and Deposition: Negligible<br>• Noise: Negligible – Minor<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: Negligible – Minor<br>• Air Emissions: No Impact<br>• Visible Structures: Negligible – Minor<br>• Lighting: Negligible – Minor | • The SFWF WTGs will be spaced at least 0.8 mile (1.3 km, 0.7 nm) apart; this wide spacing will allow avian species to avoid individual WTGs and minimize risk of potential collision.<br>• The location of the SFWF, more than 18 miles (30 km, 16 nm) offshore, avoids the coastal areas, which are known to attract birds, particularly shorebirds and seaducks.<br>• Lighting during operations will be limited to the minimum required by regulation and for safety, therefore minimizing the potential for attraction or disorientation.<br>• DWSF will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.<br>• Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D to this COP).<br>• The SFEC sea-to-shore transition will be installed via HDD to avoid impacts to the dunes, beach, and near-shore zone.<br>• An avian management plan for listed species will be prepared for the SFEC - Onshore.<br>• The SFEC - Onshore cable will be buried; therefore, avoiding the risk to birds associated with overhead lines. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Bat Species | • Seafloor and Land Disturbance: Negligible – Minor<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: Negligible<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: Negligible<br>• Air Emissions: No Impact<br>• Visible Structures: Negligible – Minor<br>• Lighting: Negligible – Minor | • Lighting during operations will be limited to the minimum required by regulation and for safety, therefore minimizing the potential for attraction (or attraction of insect prey) and possibly collision of bats at night.<br>• SFEC - Onshore will be located underground in previously disturbed areas, such as roadways and railroad ROW, therefore, minimizing potential impacts from clearing. |
| Above-Ground Historic Properties | • Seafloor and Land Disturbance: No Impact<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: Negligible<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: Negligible<br>• Air Emissions: No Impact<br>• Visible Structure: Minor<br>• Lighting: Negligible – Minor | • The location of the SFWF WTGs, approximately 18.9 miles (30.4 km, 16.4 nm) from Block Island, 22 miles (35.4 km, 19.1 nm) from Martha's Vineyard, and 34.9 miles (56.2 km, 30.3 nm) from Montauk, restricts available views from visually sensitive above-ground historic properties.<br>• SFWF WTGs will have uniform design, speed, height, and rotor diameter.<br>• The color of the SFWF WTGs (less than 5 grey tone) generally blends well with the sky at the horizon and eliminates the need for daytime lights or red paint marking of the blade tips.<br>• The SFEC - Onshore cable will be buried; therefore, minimizing potential visual impacts to above ground historic properties.<br>• The SFEC - Interconnection Facility will be located adjacent to an existing substation on parcel zoned for commercial and industrial/utility use.<br>• The SFEC - Interconnection Facility land parcel is currently screened by mature trees. After construction, additional screening will be considered to further reduce potential visibility and visual impact. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Marine Archaeological Resources | • Seafloor and Land Disturbance: Minor – Moderate<br>• Sediment Suspension and Deposition: Negligible<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: No Impact<br>• Air Emissions: No Impact<br>• Visible Structures: No Impact<br>• Lighting: No Impact | • The SFWF and SFEC - Offshore will avoid or minimize impacts to potential submerged cultural sites, to the extent practicable.<br>• Native American tribes were involved, and will continue to be involved, in marine survey protocol design, execution of the surveys, and interpretation of the results.<br>• A plan for vessels will be developed prior to construction to identify no-anchor areas inside the MWA to protect sensitive areas or other areas to be avoided. An Unanticipated Discovery Plan will be implemented that will include stop-work and notification procedures to be followed if a cultural resource is encountered during installation.<br>• As appropriate, DWSF will conduct additional archaeological analysis and/or investigation to further assess potential sensitive areas. |
| Terrestrial Archaeological Resources | • Seafloor and Land Disturbance: Minor – Moderate<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: No Impact<br>• Air Emissions: No Impact<br>• Visible Structures: No Impact<br>• Lighting: No Impact | • The route for the SFEC - Onshore will minimize impacts to, or avoid, potential terrestrial archeological resources, to the extent practicable.<br>• Native American tribes were involved, and will continue to be involved, in terrestrial survey protocol design, execution of the surveys, and interpretation of the results.<br>• Analysis shows that the majority of the SFEC - Onshore route has been previously disturbed; therefore, the risk of potentially encountering undisturbed archaeological deposits is minimized.<br>• An Unanticipated Discovery Plan will be implemented that will include stop-work and notification procedures to be followed if a cultural resource is encountered during installation.<br>• DWSF will conduct additional archaeological investigation to further assess potential sensitive areas. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Visual Resources | • Seafloor and Land Disturbance: No Impact<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: Minor<br>• Air Emissions: No Impact<br>• Visible Structures: Minor<br>• Lighting: Minor | • The location of the SFWF WTGs, approximately 18.9 miles (30.4 km, 16.4 nm) from Block Island, 22 miles (35.4 km, 19.1 nm) from Martha's Vineyard, and 34.9 miles (56.2 km, 30.3 nm) from Montauk, restricts available views from visually sensitive public resources and population centers.<br>• SFWF WTGs will have uniform design, speed, height, and rotor diameter.<br>• The color of the SFWF WTGs (less than 5 grey tone) generally blends well with the sky at the horizon and eliminates the need for daytime lights or red paint marking of the blade tips.<br>• Use of ADLS will mitigate nighttime visual impacts if the technology is commercially available and approved by BOEM.<br>• The SFEC - Interconnection Facility will be located adjacent to an existing substation on a parcel zoned for commercial and industrial use.<br>• At the SFEC - Interconnection Facility, additional screening will be considered to further reduce potential visibility and noise. |
| Population, Economy, & Employment | • Seafloor and Land Disturbance: No Impact<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: Negligible<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: Negligible<br>• Air Emissions: No Impact<br>• Visible Structure: Negligible - Minor<br>• Lighting: No Impact | • Where possible, local workers will be hired to meet labor needs for Project construction, O&M, and decommissioning.<br>• The location of the SFWF WTGs restricts available views from visually sensitive public resources and population centers.<br>• The SFEC - Onshore construction schedule has been designed to minimize impacts to the local community during the summer tourist season.<br>• At the SFEC - Interconnection Facility, additional screening will be considered to further reduce potential visibility and noise.<br>• New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Property Values | • Seafloor and Land Disturbance: No Impact<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: Negligible<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: Negligible<br>• Air Emissions: No Impact<br>• Visible Structure: Negligible<br>• Lighting: Negligible | • The SFEC - Onshore cable will be buried; therefore, minimizing potential impacts to adjacent properties.<br>• The location of the SFWF WTGs restricts available views from visually sensitive public resources and population centers.<br>• The SFEC - Onshore construction schedule has been designed to minimize impacts to the local community during the summer tourist season.<br>• At the SFEC - Interconnection Facility, additional screening will be considered to further reduce potential visibility and noise.<br>• New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures. |
| Public Services | • Seafloor and Land Disturbance: No Impact<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: Negligible<br>• Air emissions: No Impact<br>• Visible Structures: No Impact<br>• Lighting: No Impact | • The SFEC - Onshore construction schedule has been designed to minimize impacts to the local community during the summer tourist season.<br>• New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.<br>• DWSF will also coordinate with local authorities during SFEC – Onshore construction to minimize local traffic impacts.<br>• A comprehensive communication plan will be implemented during offshore construction. DWSF will submit information to the USCG to issue Local Notice to Mariners during offshore installation activities. |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Recreation & Tourism | • Seafloor and Land Disturbance: Negligible<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: Negligible<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: Negligible<br>• Air Emissions: No Impact<br>• Visible Structures: Negligible – Minor<br>• Lighting: Negligible – Minor | • The location of the SFWF WTGs restricts available views from visually sensitive public resources and population centers.<br>• A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Project website, public notices to mariners and vessel float plans, and a fisheries liaison. DWSF will submit information to the USCG to issue Local Notice to Mariners during offshore installation activities.<br>• The communication plan will also include outreach to stakeholders in the offshore recreational and tourism industry to minimize impacts to recreational events (e.g., sailboat races).<br>• The SFEC - Onshore construction schedule has been designed to minimize impacts to the local community during the summer tourist season.<br>• New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.<br>• DWSF will also coordinate with local authorities during SFEC - Onshore construction to minimize local traffic and noise impacts. |

| | | |
|---|---|---|
| Commercial and Recreational Fishing | • Seafloor and Land Disturbance: Minor – Moderate<br>• Sediment Suspension and Deposition: Negligible<br>• Noise: Negligible – Minor<br>• Electromagnetic Field: Negligible<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: Minor<br>• Air Emissions: No Impact<br>• Visible Structures: Minor<br>• Lighting: No Impact | • The SFWF WTGs will be spaced at least 0.8 mile (1.3 km, 0.7 nm) apart, and in an approximate east-west/north-south grid layout, to maintain navigability for fishing vessels and fishing activity.<br>• The inter-array cable and SFEC - Offshore will be buried to a target depth of 4 to 6 feet (1.2 to 1.8 m).<br>• The SFEC sea-to-shore transition will be installed via HDD to avoid impacts to the dunes, beach, and near-shore zone, including. sensitive shoreline habitats and shoreline fishing areas.<br>• As appropriate and feasible, BMPs will be implemented to minimize impacts on fisheries, as described in the *Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585* (BOEM, 2015).<br>• Siting of the SFWF and SFEC - Offshore were informed by site-specific benthic habitat assessments and Atlantic cod spawning surveys.<br>• DWSF is committed to collaborative science with the commercial and recreational fishing industries pre-, during, and post-construction.<br>• Each WTG will be marked and lit with both USCG and approved aviation lighting.<br>• DWSF will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.<br>• Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D to this COP).<br>• Communications and outreach with the commercial and recreational fishing industries will be guided by the Project-specific Fisheries Communications Plan (Appendix B to this COP). This outreach will be led by the DWSF Fisheries Liaisons. Fisheries Representatives from the ports of Montauk, Point Judith, and |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| | | New Bedford represent the fishing community.<br>• A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Fisheries Liaison, a Project website, and public notices to mariners and vessel float plans (in coordination with USCG). |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Commercial Shipping and Other Marine Uses | • Seafloor and Land Disturbance: No Impact<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: Negligible – Minor<br>• Air Emissions: No Impact<br>• Visible Structures: Negligible<br>• Lighting: Negligible | • The SFWF WTGs will be spaced at least 0.8 mile (1.3 km, 0.7 nm) apart, and in an approximate east-west/north-south grid layout, to maintain navigability.<br>• Each WTG will be marked and lit with both USCG and approved aviation lighting. AIS will be installed at the SFWF marking the corners of the wind farm to assist in safe navigation.<br>• All appropriate lighting and marking schemes, based on current regulations, will be implemented.<br>• DWSF will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.<br>• Accidental spill or release of oils or other hazardous materials will be managed through the OSRP (Appendix D to this COP).<br>• Project construction, O&M, and decommissioning activities will be coordinated with appropriate contacts at USCG and DOD command headquarters.<br>• A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Fisheries Liaison, Project website, and public notices to mariners and vessel float plans (in coordination with USCG). |

**Table 4.7-2. Summary of Potential Impacts and Environmental Protection Measures, by Resource**

| Resource | Potential Impacts by IPF | Environmental Protection Measures |
|---|---|---|
| Coastal Land Use & Infrastructure | • Seafloor and Land Disturbance: Negligible – Minor<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: No Impact<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: Negligible<br>• Trash and Debris: Negligible<br>• Traffic: Negligible<br>• Air Emissions: No Impact<br>• Visible Structure: Negligible<br>• Lighting: Negligible | • SFEC - Onshore will be located underground in previously disturbed areas, such as roadways and railroad ROW.<br>• The SFEC sea-to-shore transition will be installed via HDD to avoid impacts to the dunes, beach, and near-shore zone. New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.<br>• DWSF will also coordinate with local authorities during SFEC - onshore construction to minimize local traffic and noise impacts.<br>• A SWPPP, including erosion and sedimentation control measures, and a SPCC Plan, will minimize potential impacts to adjacent lands uses during construction of the SFEC - Onshore. |
| Environmental Justice | • Seafloor and Land Disturbance: No Impact<br>• Sediment Suspension and Deposition: No Impact<br>• Noise: Negligible<br>• Electromagnetic Field: No Impact<br>• Discharges and Releases: No Impact<br>• Trash and Debris: No Impact<br>• Traffic: Negligible<br>• Air Emissions: No Impact<br>• Visible Structure: Negligible<br>• Lighting: No Impact | • The use of wind to generate electricity will have a beneficial impact on air emissions in East Hampton, as it reduces the need for electricity generation from traditional fossil fuel powered plants on the South Fork of Long Island that produce greenhouse gas emissions.<br>• Where possible, local workers will be hired to meet labor needs for Project construction, O&M, and decommissioning.<br>• New York State Law requires that the SFEC - Onshore be constructed in compliance with a detailed plan that includes traffic and other control measures.<br>• DWSF will also coordinate with local authorities during SFEC - Onshore construction to minimize local traffic and noise impacts. |

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