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Public Service of New Hampshire
Seacoast Reliability Project

Madbury, Durham, Newington & Portsmouth, NH

Essential Fish Habitat Assessment

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March 2016

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1.0 Introduction

The proposed Seacoast Reliability Project ("SRP" or "Project") is a new, 115-kilovolt (115 kV) AC electric power transmission line to be owned and operated by Public Service Company of New Hampshire d/b/a Eversource Energy ("PSNH"). It runs approximately 12.9 miles from PSNH's Madbury Substation in Madbury, New Hampshire, through the Towns of Durham and Newington, New Hampshire, to PSNH's Portsmouth Substation in Portsmouth, New Hampshire. The SRP includes an approximately 0.9-mile submarine segment within the existing charted Cable Area of Little Bay (Durham/Newington, NH; Figure 1). The submarine crossing will consist of three cables installed in the sediments using predominantly jet plow technology, with hand jetting and trenching with an excavator near the shore.

This report describes the habitat requirements for species having Essential Fish Habitat ("EFH") designation within the proposed Project Area in Little Bay. For each species, the EFH requirements were compared to the existing Little Bay habitat to evaluate the likelihood of that species' occurrence within the proposed Project Area.

2.0 Description of Habitat and Proposed Action

2.1 Essential Fish Habitat Description

The Magnuson-Stevens Act of 1976 was established to promote conservation of marine fishery (shellfish and finfish) resources. This included the establishment of eight regional fishery management councils ("FMCs") that develop fishery management plans to properly manage fishery resources within their jurisdictional waters. The 1986 and 1996 amendments to the Magnuson Act, renamed the Sustainable Fisheries Act, recognized that many fisheries are dependent on nearshore and estuarine habitats for at least part of their lifecycles and included evaluation of habitat loss and protection of critical habitat. The marine environments important to marine fisheries are referred to as EFH and are defined to include "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." The act further mandates that the National Marine Fisheries Service ("NMFS") coordinate with other federal agencies to avoid, minimize, or otherwise offset adverse effects on EFH that could result from proposed activities

NMFS uses a grid (10′ latitude by 10′ longitude squares) for geographic designations of EFH, and designates EFH for estuaries and rivers that are outside of the grid (National Oceanic and Atmospheric Administration "NOAA" 2013a). The EFH designations for the Great Bay estuary (New Hampshire/Maine) include estuarine species as well as marine species from the EFH square (southeast corner at 43°00′ N, 70°40′ W), which partially overlaps the estuary (NOAA 2013b; Figure 2). For each species and life stage, EFH designation is based on three salinity zones: tidal freshwater (0.0 - < 0.5 parts per thousand "ppt"), mixing water/brackish (0.5 – 25.0 ppt), and seawater (> 25 ppt, Table 1). The project location in Little Bay is fully within the area of the Great Bay estuary designated as seawater zone (NOAA 2013c; Figure 3).

2.2 Existing Habitat at Project Location

The characteristics of the existing habitat in Little Bay at the project location were used to determine the likelihood of EFH presence or absence for each fish species and lifestage with EFH designation in the seawater zone of the Great Bay estuary. See the Natural Resource Existing Conditions Report for descriptions of existing substrates, biota and water quality conditions. In general, the conditions used for the EFH evaluation of the proposed Project Area were:

- Salinity >25 ppt year-round due to the Little Bay designation as seawater zone;
- Dissolved oxygen ("DO") levels similar to Great Bay (3.7 to 17.4 mg/l; National Estuarine Research Reserve System "NERRS" 2014)
- Mean water temperature ranges from 2 to 24°C (36 to 75°F) (NERRS 2014)
- Maximum depth range of 9.3 to 12.3 meters (30.6 to 40.2 feet) at the deepest area of the cable corridor
- Substrate of fine sand, silt and soft mud in the intertidal zone
- Substrate of fine to medium sand, silts, clay, and shell fragments in deeper areas

3.0 Essential Fish Habitat Species

3.1 Great Bay Estuary Essential Fish Habitat Species

The seawater salinity zone of the Great Bay estuary is designated as potential EFH for at least one life stage of 12 finfish and one shellfish species (Table 1). The specific EFH criteria for each life stage of these 13 species were used to determine potential EFH presence by month at the project location (Table 2). The determination of EFH presence at the project location does not imply historic or current use by that species or life stage, only that the EFH criteria are met. For any species and life stage identified as having EFH at the project location, all potential Project-related EFH impacts were evaluated.

3.1.1 Atlantic Cod (*Gadus morhua*)

Primary EFH Reference: Lough 2004.
The Great Bay estuary contains EFH for Atlantic Cod eggs and larvae in the seawater zone (Table 1). Cod Egg EFH is surface waters from fall through spring, with temperatures <12°C (54°F), salinities 32-33 ppt, and bottom depths <110 meters (360.9 feet) (Table 2). Larvae have a minimum EFH depth of 30 meters (98.4 feet), and the maximum depth of the project location is 12.3 meters (40.4 feet). The Project area contains EFH for Atlantic Cod eggs, and likely does not contain EFH for Atlantic Cod larvae.

Atlantic Cod spawning generally occurs on gravel and cobble substrate in geographic areas where the eggs and larvae are likely to be retained (Fahay 1983, Hutchings et al. 1993). The intertidal zone and deeper areas of the Little Bay cable corridor have a fine sand and soft mud substrate, with some areas of exposed compact gravel. Although spawning would not likely occur within the proposed Project Area due to the soft substrate, Atlantic Cod eggs are buoyant and pelagic and are likely transported into the Great Bay estuary from

nearshore Atlantic Ocean spawning grounds. Atlantic Cod eggs and larvae are relatively "common" in Great Bay (Jury *et al*. 1994). The maximum Great Bay water temperature from January through March meets the Atlantic Cod egg EFH criteria of <12°C (54°F). Monthly mean water temperature in Great Bay is <12°C (54°F) in November, December, and April, although the maximum temperatures during those months may exceed 12°C (54°F). Atlantic Cod egg EFH may be present at the Project Area from November through April (Table 3).

3.1.2. Atlantic Halibut (*Hippoglossus hippoglossus*)

Primary EFH Reference: Carginelli *et al*. 1999

The seawater zone of the Great Bay estuary contains EFH for Atlantic Halibut eggs, larvae, juveniles, adults, and spawning adults (Table 1). Atlantic Halibut Egg EFH includes temperatures 4-7°C (39-45°F), salinities <35 ppt, and bottom depths <700 meters (2,296.6 feet) (Table 2). EFH for larvae is surface waters with salinity 30-35 ppt (Table 2). Ichthyoplankton surveys in the Piscataqua River in 2000-2003 did not collect any Atlantic Halibut eggs or larvae (NAI 2004). Spawning is believed to occur on rough or rocky slopes of the continental shelf outer bank at depths of 183 to 700 meters (600.4 to 2,296.6 feet) (Scott and Scott 1998, Haug 1990), although the EFH depth requirement is defined as <700 meters (2,296.6 feet). The maximum depth at the project location does not meet the EFH depth requirement of juvenile (20 meters; 65.6 feet) or adult (100 meters; 328.1 feet) Atlantic Halibut.

Atlantic Halibut eggs are buoyant and drift suspended in the water column at 54-90 meters (177.2-295.3 feet) (Collette and Klein-MacPhee 2002). Additionally, Atlantic Halibut are uncommon in the Gulf of Maine, where there is no present-day spawning population (Collette and Klein-MacPhee 2002). The overall scarcity of this species in the geographic region and the shallow depths of the cable corridor suggest that Atlantic Halibut egg or larvae are highly unlikely to occur at the project location in Little Bay. However, the project location meets EFH criteria for Atlantic Halibut eggs and spawning adults from November through March, and for larvae with no defined period of occurrence (Table 3).

3.1.3. Atlantic Herring (*Clupea harengus*)

Primary EFH Reference: Stevenson and Scott 2005.

The Great Bay estuary contains EFH for larval and juvenile Atlantic Herring in the seawater zone (Table 1). The minimum EFH depth requirements for these life stages are 50 meters (164 feet) for larvae and 15 meters (49.2 feet) for juveniles (Table 2). Due to insufficient depth, EFH is not present at the project location for any life stage of Atlantic Herring.

3.1.4. Atlantic Mackerel (*Scomber scombrus*)

Primary EFH Reference: Studholme *et al*. 1999.

The seawater zone of the Great Bay estuary contains EFH for Atlantic Mackerel eggs, larvae, and juveniles. The habitat for these life stages is pelagic waters with minimum depths of 0 m for eggs and juveniles, and 10 meters (32.8 feet) for larvae (Table 2). The EFH criteria do not define a period of occurrence for any Atlantic Mackerel life stage. Based on EFH temperatures and periods of occurrence described by Jury *et al*. (1994), the proposed project

location likely provides EFH for Atlantic Mackerel eggs in May and June, for larvae in May, June and August, and for juveniles from August through December (Table 3).

3.1.5. Atlantic Sea Scallop (*Placopecten magellanicus*)

Primary EFH Reference: Hart 2004.
The seawater zone of the Great Bay estuary contains EFH for juvenile and adult Atlantic Sea Scallops (Table 1). The water depth at project location is shallower than that described for juveniles and adults EFH (18-110 meters) (59.1-360.9 feet). Due to insufficient depth, EFH is not likely present at the project location for any life stage of Atlantic Sea Scallop.

3.1.6. Bluefish (*Pomatomus saltatrix*)

Primary EFH Reference: Shepherd and Packer 2006.
The Great Bay seawater zone contains EFH for juvenile and adult Bluefish (Table 1). Both life stages are described as pelagic. Juveniles are common in Great Bay from June through October (Jury *et al*. 1994), and prefer salinities 23-33 ppt, but may occur in salinities as low as 3 ppt (Table 2). Juveniles have a preferred temperature range of 19-24 °C (66-75°F), and may use tidal creeks during the day. Adults are highly migratory and prefer salinities > 25 ppt and temperatures of 14-16 °C (57-61°F). Both juveniles and adults occur in North Atlantic estuaries from June through October. The project location in Little Bay likely contains juvenile Bluefish EFH from June through October, and adult Bluefish EFH in October.

3.1.7. Haddock (*Melanogrammus aeglefinus*)

Primary EFH Reference: Brodziak 2005.
The Great Bay seawater zone contains EFH for egg and larval Haddock (Table 1). The project location bottom depth is shallower than the EFH ranges described for both egg (50-90 meters) (164-295.3 feet) and larval (30-90 meters) (98.4-295.3 feet) life stages. Haddock EFH is likely not present at the project location.

3.1.8. Pollock (*Pollachius virens*)

Primary EFH Reference: Cargnelli *et al*. 1999.
The seawater zone of Great Bay contains EFH for eggs, larvae, and juvenile Pollock (Table 1). The project location does not meet the EFH depth requirements of eggs (30-270 meters) (98.4-885.8 feet). Larval Pollock EFH is pelagic waters over 10-250 meters (32.8-820.2 feet) bottom depths. Juvenile EFH is bottom habitats of vegetation, sand, mud, or rocks at depths of 0-250 meters (0-820.2 feet), and includes the intertidal zone throughout the summer. Great Bay water temperatures exceed the EFH maximum for larvae and juveniles during summer months (June-September). Pollock EFH is likely present at the project location for larvae from October through May, and for juveniles during May and October (Table 3).

3.1.9. Red Hake (*Urophycis chuss*)

Primary EFH Reference: Steimle *et al.* 1999.
The seawater zone of the Great Bay Estuarine Reserve contains EFH for juvenile and adult Red Hake (Table 1). Juvenile EFH is bottom habitat with shell fragment substrate, including areas with an abundance of live scallops. Juvenile Red Hake EFH is likely not present at the

project location due to the dominant sand and mud substrate although this life stage has been reported to be common in Great Bay from July through October (Jury *et al*. 1994). Adult EFH is described as bottom habitat in depressions in sand and mud, with a temperature requirement of <12°C (54°F). The mean temperature in Great Bay from 2009-2014 was <12°C (54°F) from November through April. Although adult Red Hake are common in Great Bay from July through October (Jury *et al.* 1994), water temperatures during that time exceed EFH criteria. Adult Red Hake EFH is likely present at the project location in the months of March, April, November and December (Table 3).

3.1.10. White Hake (*Urophycis tenuis*)

Primary EFH Reference: Chang *et al.* 1999a.
The Great Bay seawater zone contains EFH for eggs, juvenile and adult White Hake (Table 1). Eggs are pelagic and occur in August and September, with no other EFH conditions specifically described. Hake eggs (*Urophycis* and *Phycis* spp.) are found in temperatures 4-25°C (39-77°F) (Berrien and Sibunka 1999). Juveniles have pelagic and demersal stages, with the pelagic stage occurring in May-September. The habitat of demersal juveniles and adults is depths >5 meters (16.4 feet), with substrates of mud or fine-grained sand. The project location likely contains EFH for White Hake eggs (August, September), juveniles (May, June, and September), and adults (March-May, October and November; Table 3).

3.1.11. Windowpane Flounder (*Scophthalmus aquosus*)

Primary EFH Reference: Chang *et al.* 1999b.
The seawater zone of Great Bay contains EFH for eggs, larvae, juvenile, adult, and spawning adult Windowpane Flounder (Table 1). The project location meets EFH bottom depth requirements for all life stages. Eggs are found in surface waters and larvae are pelagic, with both stages occurring February-November. Windowpane eggs and larvae were identified in ichthyoplankton samples collected from 2001-2003 in the Piscataqua River (NAI 2004). Juvenile, adult, and spawning adult EFH is bottom habitats with fine sand or mud substrate, with spawning adults occurring February-December. Juveniles may occur in the summer, and adults may be found at the project location all year (Collette and Klein-McPhee 2000). The project location contains EFH for all life stages of Windowpane Flounder. EFH for eggs and larvae is likely present during February-June and September-November, and juvenile EFH is likely present June-October (Table 3). Adult Windowpane EFH may be present year-round, and spawning adult EFH is likely present February-June and September-December (Table 3).

3.1.12. Winter Flounder (*Pseudopleuronectes americanus*)

Primary EFH Reference: Pereira *et al.* 1999.
The seawater zone of Great Bay contains EFH for egg, larval, juvenile, adult, and spawning adult Winter Flounder (Table 1). The proposed project location meets the EFH criteria for bottom depth and substrate for all life stages (Table 2). The EFH period of occurrence is February through June for eggs and spawning adults, and March through July for larvae. Juvenile Winter Flounder spend their first year in shallow inshore waters at temperatures <30°C (86°F). Adult Winter Flounder occupy inshore waters from fall through spring, and

prefer temperatures <15°C (59°F). The project location likely contains EFH during some portion of the year for each life stage of Winter Flounder (Table 3).

Winter flounder commonly spawn in water < 5 meters (16.5 feet) deep in estuaries and bays. The demersal eggs adhere to the substrate, which is most commonly sand, but may also be mud, gravel, or algal mats. Winter Flounder eggs have been found in water temperatures < 10°C (50°F) at salinities ranging from 10 to 30 ppt (Collette and Klein-MacPhee 2002). Spawning is typically described as occurring in estuaries, coastal ponds, or backwaters. Additionally, the demersal eggs remain adhered to the substrate at the spawning location, and larvae and juveniles do not disperse far from the spawning area (Perlmutter 1947). Spawning in waters with restricted flow and low turnover rates has been found to keep developing larvae in nursery habitat (Crawford and Carey 1985, Monteleone 1992). Winter Flounder spawning and subsequent egg deposition and larval development in the vicinity of the Little Bay cable corridor may be limited due to tidal water flow. Adult Winter Flounder are abundant in Great Bay during all months of the year (Jury *et al*. 1994). Juveniles and adults have the potential to use habitat within the cable corridor when temperature requirements are met, particularly during high tide when the maximum amount of habitat is accessible.

3.1.13. Yellowtail Flounder (*Limanda ferruginea*)

Primary EFH Reference: Johnson *et al.* 1999.
The Great Bay seawater zone contains EFH for egg and larval Yellowtail Flounder (Table 1). The minimum EFH depth requirement for eggs is 30 meters (98.4 feet). The proposed project location has a maximum depth of 12.3 meters (40.4 feet), and therefore does not contain EFH for Yellowtail Flounder eggs. The cable corridor meets the larval EFH criteria of 10-90 meters (32.8-295.3 feet) depth and <17°C (63°F) temperature. In the Great Bay seawater zone, Yellowtail Flounder larvae are described as "rare" with a period of occurrence of April-September (Jury *et al*. 1994). Yellowtail Flounder larvae were identified from ichthyoplankton surveys conducted from 2001-2003 in the Piscataqua River downstream of the project location (NAI 2004). The proposed project location likely contains EFH for Yellowtail Flounder larvae.

4.0 Summary

Of the 13 species with EFH designation in the Great Bay estuary, the proposed Project Area in Little Bay was determined to meet the EFH requirements for at least one life stage of 10 species at some point during the year (Table 2). The remaining 3 species, Atlantic Herring, Atlantic Sea Scallop and Haddock, have life cycle requirements, primarily water depths, that result in no EFH present in the Project Area.

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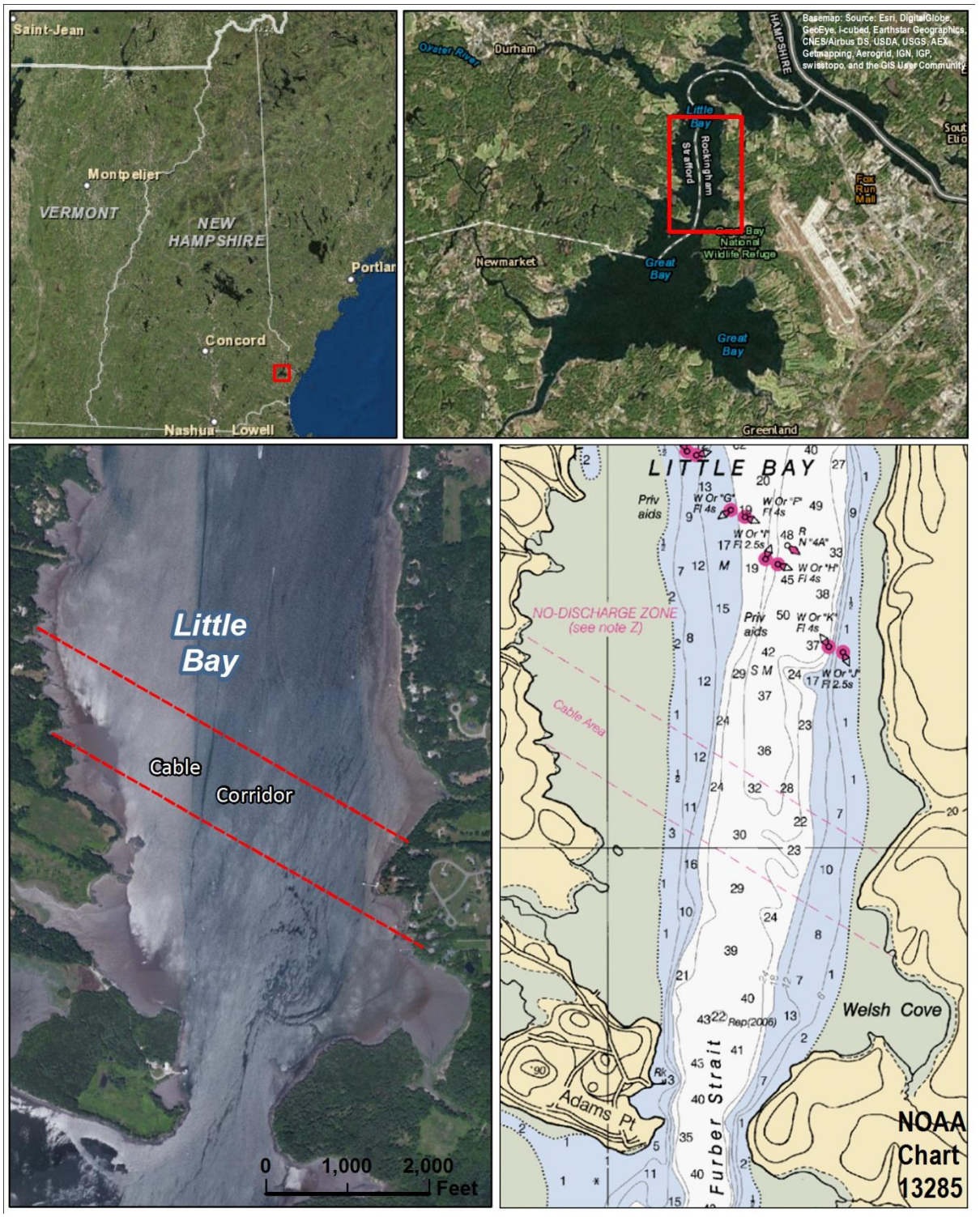

Figure 1. Location of the proposed cable crossing within the charted Cable Area in Little Bay.

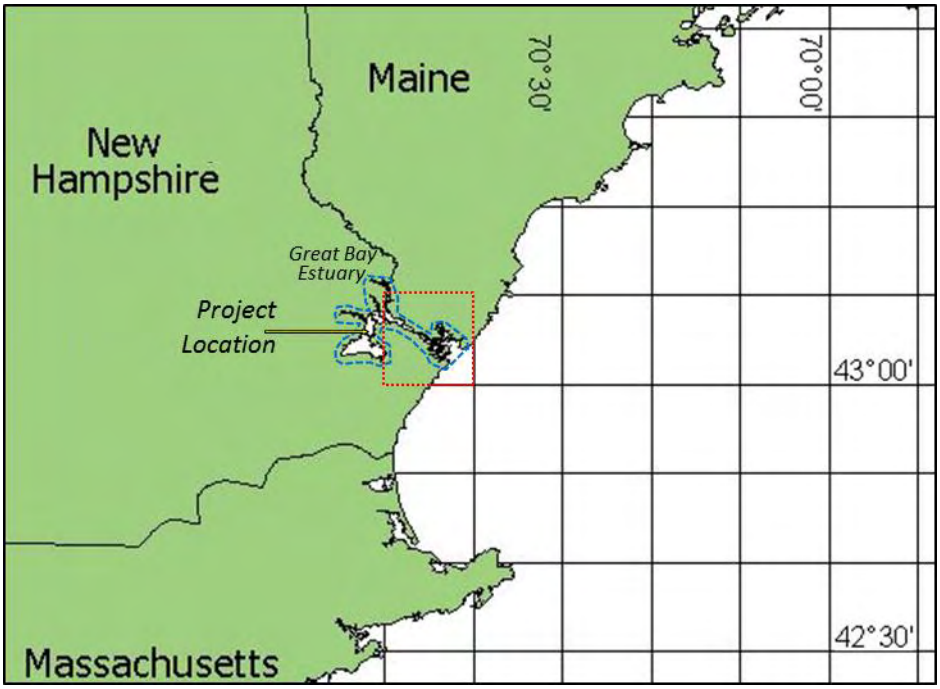

Figure 2. Essential Fish Habitat (EFH) for the Great Bay estuary (dashed blue outline) includes species within the estuary and species within the EFH grid, which overlaps a portion of the estuary (dashed red outline). Figure is modified from NOAA (2013a)

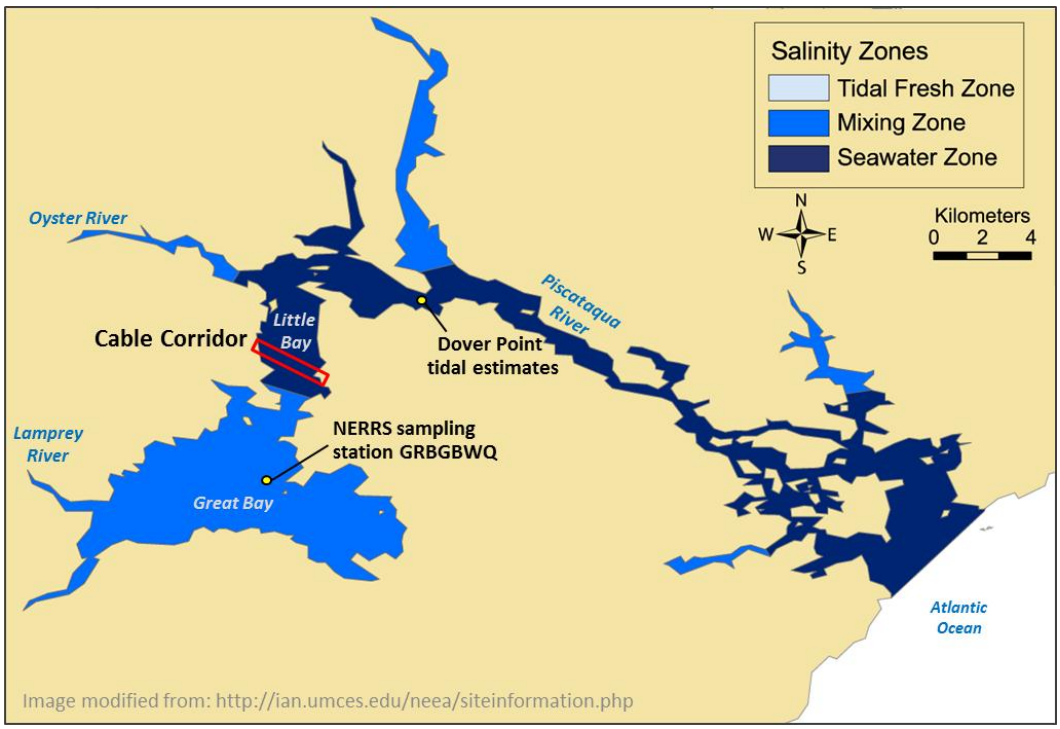

Figure 3. Salinity zones of the Great Bay estuary showing the location of the Little Bay cable corridor, and sampling stations used for estimates of water temperature, dissolved oxygen, and tide levels (modified from: NOAA 2013c)

Table 1. Summary of Essential Fish Habitat (EFH) Designations for the Great Bay Estuary (New Hampshire/Maine). Only species and life stages with saltwater EFH were evaluated for the proposed Little Bay cable crossing project.

Species	Salinity Zone[1]				
	Eggs	Larvae	Juveniles	Adults	Spawning Adults
Atlantic Cod (*Gadus morhua*)	S	S			
Atlantic Halibut (*Hippoglossus hippoglossus*)	S	S	S	S	S
Atlantic Herring (*Clupea harengus*)		M,S	M,S		
Atlantic Mackerel (*Scomber scombrus*)	M,S	M,S	S		
Atlantic Salmon (*Salmo salar*)			F,M		
Atlantic Sea Scallop (*Placopecten magellanicus*)			S	S	
Bluefish (*Pomatomus saltatrix*)			M,S	M,S	
Haddock (*Melanogrammus aeglefinus*)	S	S			
Pollock (*Pollachius virens*)	S	S	S		
Red Hake (*Urophycis chuss*)			S	S	
White Hake (*Urophycis tenuis*)	S		S	S	
Windowpane Flounder (*Scopthalmus aquosus*)	S	S	S	S	S
Winter Flounder (*Pleuronectes americanus*)	M,S	M,S	M,S	M,S	M,S
Yellowtail Flounder (*Pleuronectes ferruginea*)	S	S			

[1] Freshwater (F): salinity <0.5ppt
Mixing Zone (M): 0.5 < salinity <25ppt
Seawater (S): salinity > 25ppt

Table 2. Descriptions for life stages of species with Essential Fish Habitat (EFH) designations for the Great Bay estuary saltwater zone (salinity >25ppt). The specific requirements for each life stage were used to determine EFH presence at the proposed Little Bay cable crossing project location.

Species	Lifestage	Temp. (°C)	Salinity (ppt)	Bottom Depth (m)	Habitat	Period of Occurrence[1]	EFH Present at Project Location
Atlantic Cod (*Gadus morhua*)	Eggs	<12	32 - 33	<110	Surface waters	Fall-Spring	Yes
	Larvae	<10	32 - 33	30-70	Pelagic waters	Spring	No
Atlantic Halibut *(Hippoglossus hippoglossus)*	Eggs	4 - 7	<35	<700	Pelagic waters to the sea floor	Between late fall and early spring, peak Nov and Dec.	Yes
	Larvae		30 - 35		Surface waters		Yes
	Juveniles	>2		20 - 60	Bottom habitats with a substrate of sand, gravel, or clay		No
	Adults	<13.6	30.4-35.3	100-700	Bottom habitats with a substrate of sand, gravel, or clay		No
	Spawning Adults	<7	<35	<700	Substrate of soft mud, clay, sand, or gravel; rough or rocky bottom locations along slopes of outer banks	Between late fall and early spring; peak Nov and Dec	No
Atlantic Herring *(Clupea harengus)*	Larvae	<16	32	50 - 90	Pelagic waters	Between August and April, peaks from Sept. - Nov.	No
	Juveniles	<10	26 - 32	15-135	Pelagic waters and bottom habitats		No
Atlantic Mackerel *(Scomber scombrus)*	Eggs	5 - 23	18 - >30	0 - 15	Pelagic waters		Yes
	Larvae	6 - 22	>30	10-130	Pelagic waters		Yes
	Juveniles	4 - 22	>25	0 - 320	Pelagic waters		Yes
Atlantic Sea Scallop (*Placopecten magellanicus*)	Juveniles	<15		18-110	Bottom habitats with a substrate of cobble, shells, and silt		No
	Adults	<21	>16.5	18-110	Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand		No

Species	Lifestage	Temp. (°C)	Salinity (ppt)	Bottom Depth (m)	Habitat	Period of Occurrence[1]	EFH Present at Project Location
Bluefish *(Pomatomus saltatrix)*	Juveniles	19-24	23 - 36		Pelagic waters	N. Atlantic estuaries: Jun-Oct Mid-Atlantic estuaries: May-Oct S. Atlantic estuaries: Mar-Dec	Yes
	Adults	14-16	>25ppt		Pelagic waters	N. Atlantic estuaries: Jun-Oct Mid-Atlantic estuaries: Apr-Oct S. Atlantic estuaries: May-Jan	Yes
Haddock (*Melanogrammus aeglefinus*)	Eggs	<10	34 - 36	50 - 90	Surface waters	Mar-May, peak in April	No
	Larvae	<14	34 - 36	30 - 90	Surface waters	Jan-Jul, peak in April and May	No
Pollock (*Pollachius virens*)	Eggs	<17	32 - 32.8	30-270	Pelagic waters	Oct-Jun; peaks Nov-Feb	No
	Larvae	<17		10-250	Pelagic waters	Sep-Jul; peaks Dec-Feb	Yes
	Juveniles	<18	29 - 32	0 - 250	Bottom habitats with aquatic vegetation or a substrate of sand, mud or rocks	Intertidal zone throughout summer	Yes
Red Hake (*Urophycis chuss*)	Juveniles	<16	31 - 33	<100	Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops		No
	Adults	<12	33 - 34	10-130	Bottom habitats in depressions with a substrate of sand and mud		Yes
White Hake (*Urophycis tenuis*)	Eggs				Surface waters	Aug-Sep	Yes
	Juveniles	<19		5 - 225	Pelagic stage - pelagic waters; Dermersal stage - Bottom habitat with seagrass beds or substrate of mud or fine-grained sand	Pelagic stage May-Sep	Yes
	Adults	<14		5 - 325	Bottom habitats with substrate of mud or fine-grained sand in deep water		Yes

Species	Lifestage	Temp. (°C)	Salinity (ppt)	Bottom Depth (m)	Habitat	Period of Occurrence[1]	EFH Present at Project Location
Windowpane Flounder (*Scophthalmus aquosus*)	Eggs	<20		<70	Surface waters	Feb-Nov, peaks May and Oct in Mid Atlantic; Jul-Aug on GB	Yes
	Larvae	<20		<70	Pelagic waters	Feb-Nov, peaks May and Oct in Mid Atlantic; Jul-Aug on GB	Yes
	Juveniles	<25	5.5 - 36	1 - 100	Bottom habitats with substrate of mud or fine grained sand		Yes
	Adults	<26.8	5.5 - 36	1 - 75	Bottom habitats with substrate of mud or fine grained sand		Yes
	Spawning Adults	<21	5.5 - 36	1 – 75	Bottom habitats with substrate of mud or fine grained sand	Feb – Dec Peak in May in Mid. Atlantic	Yes
Winter Flounder *(Pseudopleuronectes americanus)*	Eggs	<10	10 - 30	<5	Bottom habitats with a substrate of sand, muddy sand, mud, and gravel	February to June, peak in April on GB	Yes
	Larvae	<15	4 - 30	<6	Pelagic and bottom waters	March to July, peaks in April and May on GB	Yes
	Juveniles	<25	10 - 30	1 - 50	Bottom habitats with a substrate of mud or fine grained sand		Yes
	Adults	<25	15 - 33	1 - 100	Bottom habitats including estuaries with substrate of mud, sand, gravel		Yes
	Spawning Adults	<15	5.5-36	<6	Bottom habitats including estuaries with substrate of mud, sand, gravel	Feb – Jun	Yes
Yellowtail Flounder *(Limanda ferruginea)*	Eggs	<15	32.4 - 33.5	30 - 90	Surface Waters	Mid-March to June; peaks in April to June in southern NE	Yes
	Larvae	<17	32.4 - 33.5	10 - 90	Surface waters	March to April in New York bight; May to July in southern NE and southeastern GB	Yes

[1]Geographic Areas: Gulf of Maine ("GOM"), George's Banks ("GB"), Southern New England ("NE")

Table 3. Periods of occurrence and water temperatures for species and life stages determined to have Essential Fish Habitat (EFH) within the proposed Project Area in Little Bay.

Species	Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Note
Atlantic Cod	Eggs	●	●	●	●	●	●			●	●	●	●	
Atlantic Halibut	Eggs	●	●	●	●							●	●	
	Larvae													1
	Spawning	●	●	●	●							●	●	
Atlantic Mackerel	Eggs					o	o							2
	Larvae					o	o	o	o					2
	Juveniles								o	o	o	o	o	2
Bluefish	Juveniles						●	●	●	●	●			
	Adults						●	●	●	●	●			
Pollock	Larvae	●	●	●	●	●	●	●		●	●	●	●	
	Juveniles					o	●	●	●	●	o			3
Red Hake	Adults			o	o	o	o	o	o	o	o	o	o	2
White Hake	Eggs								●	●				4
	Juveniles					●	●	●	●	●				
	Adults			o	o	o	o				o	o		5
Windowpane Flounder	Eggs		●	●	●	●	●	●	●	●	●	●		
	Larvae		●	●	●	●	●	●	●	●	●	●		
	Juveniles						o	o	o	o	o			6
	Adults	o	o	o	o	o	o	o	o	o	o	o	o	6
	Spawning		●	●	●	●	●	●	●	●	●	●	●	
Winter Flounder	Eggs		●	●	●	●	●							
	Larvae			●	●	●	●	●						
	Juveniles	o	o	o	o	o	o	o	o	o	o	o	o	6
	Adults	o	o	o	o	o					o	o	o	6
	Spawning		●	●	●	●	●							
Yellowtail Flounder	Larvae			o	●	●	●	●	●	o				2
Total meeting EFH temperature and time-of-year requirements (● or ●)		4	9	10	9	8	5	1	2	6	6	7	5	

Description	
	Mean and max water temp meets EFH
	Mean water temp meets EFH / Max water temp does not meet EFH
	Mean and max water temp do not meet EFH / Within period of occurrence
	Mean and max water temp do not meet EFH / Not within period of occurrence
●	EFH defined period of occurrence
o	Period of occurrence when not defined by EFH (see notes)

Notes

1. No EFH defined period of occurrence; larval timing and distribution not known; spawning not believed to occur in Gulf of Maine (Collette and Klein McPhee 2000)
2. Period of occurrence from Jury et al. (1994).
3. EFH period only described for intertidal juveniles (Cargnelli *et al*. 1999b)
4. Temperature range from Berrien and Sibunka 1999.
5. Period of occurrence from Fahay and Able (2011).
6. Period of occurrence from Collette and Klein McPhee (2000)

Table 4. Essential Fish Habitat (EFH) species and life stage that potentially occur within the SRP Project area.

Species	Eggs	Larvae	Juveniles	Adults	Spawning Adults
Atlantic Cod	●				
Atlantic Halibut	●	●		●	●
Atlantic Mackerel	●	●	●		
Bluefish			●	●	
Pollock		●	●		
Red Hake				●	
White Hake	●		●	●	
Windowpane Flounder	●	●	●	●	●
Winter Flounder	●	●	●	●	●
Yellowtail Flounder	●	●			