ATTACHMENT M1A

BASELINE NATURAL RESOURCES CHARACTERIZATION REPORT

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Baseline Natural Resources Characterization Report

State Pier Infrastructure Improvements
New London, Connecticut

May, 2020

Prepared for:

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Acronyms

City	City of New London
CJL	Coastal Jurisdiction Line
COP	Certificate of Permission
CPA	Connecticut Port Authority
CT DEEP	Connecticut Department of Energy and Environmental Protection
CVRR	Central Vermont Railroad
CY	cubic yard
DA/BA	Department of Agriculture/Bureau of Aquaculture
ft	feet
IPaC	Information for Planning and Consultation
LIS	Long Island Sound
m	meter
MHHW	mean higher high water
MHW	mean high water
MLLW	mean lower low water
MLW	mean low water
NAVD88	North American Vertical Datum, 1988
NECR	New England Central Railroad
NSSP-MO	National Shellfish Sanitation Program, Model Ordinance
PAH	polycyclic aromatic hydrocarbon
PCBs	polychlorinated biphenyls
RAD	gamma radiation
SUBASE-NLON	Naval Submarine Base New London
TOC	total organic carbon
USACE	United States Army Corps of Engineers
USCGA	United States Coast Guard Academy
USFWS	United States Fish and Wildlife Service
WTG	wind turbine generator

1.0 Introduction

The Connecticut Port Authority (CPA) owns the State Pier Facility, located on the Thames River in New London, Connecticut (***Figure 1***). The Connecticut General Assembly funded construction of Admiral Shear State Pier ("State Pier") almost 100 years ago to facilitate business and commerce in the state. The mission of the facility today remains essentially the same as at inception. The State Pier Facility contains approximately 4,000 feet (ft) of bulkhead along its two main piers, on-dock rail connectivity to the New England Central Railroad (NECR) system (now owned by Genesee & Wyoming), 102,000 square feet of warehouse space, deep water access, and direct connection to the interstate highway system. The site encompasses nearly 30 acres, which not only includes waterfront features such as piers and quay walls, but also includes upland areas straddling State Pier Road and land north of the Gold Star Bridge. The property is bounded to the west by the NECR tracks and to the east by the Thames River.

CPA seeks to implement State Pier Infrastructure Improvements (SPII) to retrofit the existing State Pier Facility so it can serve as a regional wind turbine generator (WTG) offshore wind support port, while at the same time continuing to support other existing long-term breakbulk operations for steel, lumber, plywood, copper billets, as well as other cargo. Once built, this facility will be able to receive very large wind energy components such as turbines, blades and towers. The onshore portion of the facility would be large enough to facilitate the off-loading and preassembly of these components, which would then be loaded onto installation vessels that would transport the components to the offshore site for final installation.

To accommodate the shipping and preassembly of the components, infrastructure improvements are needed both onshore and within the Thames River. Proposed improvements include upland activities, shoreline stabilization, installation of new bulkheads, and creation of a heavy lift area. Construction is anticipated to take three years and be completed in 2022. Impacts resulting from the proposed infrastructure improvements include permanent fill and dredging.

The purpose of this report is to summarize the existing conditions of ecological communities and natural resources within and adjacent to the SPII site. Existing conditions were obtained through review of publically-available information, documentation provided by CPA from prior investigations, site visits, and data compiled from recent nearby water dependent projects. Additional site-specific data were collected during field surveys in summer 2019. Specifically, CPA has performed eel grass (*Zostera marina*) surveys, as well as surveys designed to determine the presence/absence of shellfish and other benthic infauna and associated utilization of the areas of proposed impacts . These latter surveys are largely based upon substrate grab and shellfish rake samples. Summary reports for these 2019 data collection efforts have been prepared and are results are included as Attachment M1B .

2.0 Existing Conditions

This section describes the baseline existing conditions, natural resources, and habitats present within and adjacent to the SPII site that could be affected by proposed construction activities. ***Figure 2*** provides an aerial view of the existing conditions, including boundaries of coastal resources and existing infrastructure. Data presented herein were compiled from existing and representative information. Where appropriate, discussion of coastal habitats and resources follow the nomenclature of Connecticut General Statutes (CGS), Chapter 444 Coastal Management, Section 22a-93 Definitions.

2.1 Thames River

The Thames River is an estuarine watercourse that discharges freshwater and sediment from the interior of eastern Connecticut into Long Island Sound (LIS). It is the main drainage of the Thames River Major Drainage Basin, which encompasses approximately 1,500 square miles of eastern Connecticut and central Massachusetts. The Thames River shoreline is characterized by steep slopes of exposed bedrock or shallow-to-bedrock till slopes. The lower Thames River and New London Harbor sustains a variety of military, commercial, and recreational vessel usage. New London Harbor provides protection to a number of these vessels from the deeper, more open waters of the Atlantic Ocean and LIS.

Portions of the SPII site waters have been constructed or maintained by the United States Army Corps of Engineers (USACE) as part of the New London Harbor Navigation Project. The components of the federal navigation project immediately adjacent to the SPII are described in greater detail in DEEP Application Section III.6 and Attachment M9 of this application.

The Connecticut Department of Energy and Environmental Protection (CT DEEP) Water Quality Classification for the Thames River is SB. Class SB designated uses are habitat for marine fish and aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation. The New London, Thames River, Connecticut tide station (ID 8461490) located at the State Pier Facility has a mean tidal amplitude range of 2.56 ft and a diurnal range of 3.05 ft. Mean lower low water (MLLW) elevation is -1.84 ft in the North American Vertical Datum of 1988 (NAVD88) and the mean higher high water (MHHW) is 1.21 ft NAVD88.

A sediment characterization program in support of the project was conducted by AECOM in late 2018. An additional sediment investigation program was completed by Moffatt and Nichol in early 2020. The 2018 program involved sediment collection at twenty five (25) locations across the harbor and from six (6) locations adjacent to the State Pier Facility to characterize the physical, chemical, and radiological parameters within the area. Samples from each location were sent to a certified laboratory for grain size and chemical (e.g., metals, polychlorinated biphenyls [PCBs], pesticides, polycyclic aromatic hydrocarbon [PAH], and total organic carbon [TOC]) analysis. The samples collected adjacent to the State Pier Facility were also analyzed for gamma radiation (RAD) to assess the presence of cobalt-60 (CO-60) and cesium-137 (CS-137). In general, the sediment within the survey area is largely dominated by silt, with lesser components of sand and gravel. The 2020 sampling program was conducted to supplement the 2018 sampling results and to provide additional sediment information as the Project design had advanced. The results of the sediment characterization programs are included in JPA Attachment M2 .

2.2 Nearshore and Offshore Waters

The SPII site encompasses over 10 acres of Nearshore Waters, which are defined by Connecticut CGS Chapter 444 as intertidal and subtidal waters and substrates lying between mean high water and the -10 meter (m)/ -33 ft contour (relative to mean low water [MLW]). This is equivalent to a vertical elevation of approximately -31 ft NAVD88. The majority of Nearshore Waters are located in Winthrop Cove in areas immediately adjacent to CVRR Pier, and adjacent to the northern half of the Northeast Bulkhead, and shoreline areas extending to Winthrop Point.

In addition to Nearshore Waters, the SPII site encompasses over 16 acres of Offshore Waters, defined in Connecticut CGS Chapter 444 as waters and their substrates lying seaward of (i.e., deeper than) the -10-meter depth contour. Offshore Waters are located adjacent to the Admiral Shear State Pier and along the southern half of the Northeast Bulkhead and extend easterly to the navigational channel.

According to the wetlands and deepwater classification system (Cowardin et, al. 1979), the subtidal component of nearshore and offshore waters are classified as a subtidal estuarine system with an unconsolidated mud bottom (E1UB3).

2.3 Intertidal and Shallow Subtidal Habitats

The intertidal areas of the SPII site consist of three main shoreline habitat types including developed shorefront, rocky shorefront, and beaches and dunes. The majority of the shoreline is "developed shorefront" as defined in CGS Chapter 444 and characterized onsite as existing rip-rap or granite block and steel sheet pile pier and bulkhead faces. Most of the remaining shoreline is a "rocky shorefront" as defined in CGS Chapter 444 and characterized by erosion-resistant boulders and cobbles with little fine grained material. Rocky shorefront is present on the extreme western corner of the SPII site and north of the Northeast Bulkhead around Winthrop Point to the boat launch. Cowardin, et, al. (1979) classifies rocky shorefront as an estuarine intertidal rocky shore dominated by rubble (E2RS2). The northeastern corner the SPII site contains several small sandy pocket beaches interspersed within the eastern rocky shorefront habitat which are considered "beaches and dunes" as defined in CGS Chapter 444. The extreme western corner of the Project Area likewise exhibits a small pocket beach. Cowardin, et, al. (1979) classifies the beach component of the shorefront as an estuarine intertidal unconsolidated shore dominated by cobble-gravel and/or sand (E2US1/2). Both rocky shorefront and beaches are generally unvegetated.

2.3.1 High Intertidal

The high intertidal zone is flooded only during the highest of high tides, and generally exists in a narrow fringe between mean high water and mean higher high water (e.g. 0.92 to 1.21 ft NAVD88). The wrack lines associated with rocky shorefront and beach areas within the high intertidal habitat are littered with rubbish including plastic-based trash, timbers/wooden debris, and closed or open-celled foam washed onshore during high tide and storm events.

Additional details regarding substrate composition and species composition in this resource area, as characterized in the site-specific surveys completed in the summer of 2019 are included in Attachment M1B.

2.3.2 Mid Intertidal

The mid intertidal zone is regularly exposed and submerged by average tides (e.g., -1.65 to 0.92 ft NAVD88).

Additional details regarding substrate composition and species composition in this resource area, as characterized in the site-specific surveys completed in the summer of 2019 are included in Attachment M1B.

2.3.3 Low Intertidal

The low intertidal zone borders on the shallow subtidal zone and is only exposed to air at the lowest of low tides (e.g., -1.65 to -1.84 ft NAVD88) and is primarily marine in character.

Additional details regarding substrate composition and species composition in this resource area, as characterized in the site-specific surveys completed in the summer of 2019 are included in Attachment M1B.

2.3.4 Shallow Subtidal

Shallow subtidal habitat is a part of nearshore waters and does not have a jurisdictional definition. For the purposes of habitat evaluation at SPII, shallow subtidal habitats extend to a depth of -5 meters (-15.5 ft NAVD88).

Additional details regarding substrate composition and species composition in this resource area, as characterized in the site-specific surveys completed in the summer of 2019 are included in Attachment M1B.

2.4 Wetlands and Watercourses

On February 22, 2019, a Certified Professional Soil Scientist/Professional Wetlands Scientist from AECOM conducted an initial field visit to identify tidal and inland wetland and watercourses regulated under federal, state, or local statutes and regulations as described below. The survey area encompassed the entire inland portion of the SPII site and the Thames River shoreline from the western rail bridge over Winthrop Cove to the Thames River Boat Launch located northeast of the SPII site, under the northbound lanes of the Gold Star Bridge. Note that the boat launch and Winthrop Point are not currently included within the SPII site, but may be considered as restoration, enhancement, and/or mitigation areas in the future.

Within the SPII site, the vast majority of the shoreline is considered developed shorefront and characterized by granite block retaining/seawall, steel sheet pile bulkhead, pile-supported deck, and/or rip-rap armor. The remaining shoreline consists of rocky shorefront and/or pocket beach areas.

2.4.1 City of New London

Municipalities in Connecticut are responsible for the regulation of inland wetlands and watercourses. The City of New London (City) regulates inland wetlands and watercourses in accordance with the City of New London Inland Wetland & Watercourse Regulations (as amended through January 23, 2012) and Sections 22a-36 through 22a-45 of the Connecticut General Statutes (i.e., the Inland Wetlands and Watercourses Act). Under these regulations, the City defines watercourses and wetlands as:

- “Watercourses” means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon this city or any portion thereof, not regulated pursuant to section 22a-28 through 22a-35 of the Connecticut General Statutes. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) evidence of scour or deposits of alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident and (C) the presence of hydrophytic vegetation.
- “Wetlands” means land, including submerged land as defined in Section 2.1(a) of these regulations, not regulated pursuant to Section 22a-28 through 22a-35, inclusive, of the Connecticut General Statutes, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial and flood plain by the National Cooperative Soils Survey, as it may be amended from time to time, of the Natural Resources Conservation Soils Survey of the U.S. Department of Agricultures (USDA). Such areas may include filled, graded, or excavated sites which possess an aquic (saturated) soil moisture regime as defined by the USDA Cooperative Soil Survey.

There are no inland wetlands or watercourses within the Project Limits.

The City also regulates coastal resources (e.g., tidal wetlands and tidal waters) as part of the Coastal Site Plan Review pursuant to Section 22a-90 through 22a-112 of the Connecticut General Statutes (i.e., the Coastal Management Act). However, the City has no jurisdiction over state-owned lands.

2.4.2 Connecticut Department of Energy and Environmental Protection

The CT DEEP regulates coastal resources including tidal wetlands and tidal (e.g., nearshore, offshore, and intertidal) waters in accordance with Connecticut General Statutes Sections 22a-28 through 22a-35 (i.e., the Tidal Wetlands Act) and Sections 22a-359 through 22a-363f (i.e., the Structures, Dredging, and Fill Statutes), respectively. Unlike inland wetlands, tidal wetlands include areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below the Coastal Jurisdictional Line (CJL) an elevation of one foot above local extreme high water (Section 22a-29(2)) that support vegetation tolerant of saline environments. In New London, the CJL elevation is 2.1 ft NAVD88.

Unavoidable impacts including the placement of structures, dredging, and fill activities require a permit from the CT DEEP. The CT DEEP has established streamlined permitting for certain minor activities through the issuance of General Permits or Certificates of Permission (COP). Activities with more substantial impacts in tidal wetlands and waters that do not meet the criteria for a General Permit or a COP require an Individual Permit from CT DEEP. As detailed in the JPA, select activities onsite have received approvals under the CT DEEP COP program (authorization number 201910828-COP).

2.4.3 U.S. Army Corps of Engineers

The USACE regulates the discharge of dredged or fill material into Waters of the United States under Section 404 of the Clean Water Act. Waters of the United States include navigable waters and all their tributaries, adjacent wetlands, and other waters or wetlands with a significant nexus to navigable waters. The USACE also regulates activities in navigable waters under Section 10 of the Rivers and Harbor Act.

The USACE defines wetlands as *areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas*. Unlike inland wetlands defined under Connecticut statutes and regulations, which are identified by their soil drainage classification, USACE-regulated wetlands need to meet hydric soil and hydrophytic vegetation criteria and exhibit evidence of wetland hydrology.

Activities that involve placement of dredged material or fill in Waters of the United States require a permit from the USACE under Section 404 of the Clean Water Act. The USACE has issued a General Permit for Connecticut, which authorizes many activities in Waters of the United States. Activities that do not meet the conditions of the General Permit require an Individual Permit. As detailed in the JPA, select onsite activities have been approved under the USACE CT GP program (authorization no. NAE-2018-02161).

2.4.4 Site Visit and Resource Area Delineation

A site visit and resource area delineation was performed by an AECOM Professional Wetlands Scientist and Registered Soil Scientist on February 22, 2019. The goal of the site visit was to identify the location of any potential inland and/or tidal wetland or watercourse resources.

The site visit and resource area evaluation was conducted in accordance with the *Wetlands Delineation Manual and the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0). Hydric soil determinations were evaluated using the *Field Indicators of Hydric Soils in the United States, Version 8.0* (2016). In addition, surveys for inland wetlands and watercourses regulated by the CT DEEP were performed in accordance with the Connecticut Inland Wetlands and Watercourse Act and the City of New London's *Inland Wetland and Watercourse Regulations* (as amended January 23, 2012). The process included a general assessment of site soils, vegetation, topography, and landscape position/location that would indicate presence of a wetland or watercourse.

The site visit and resource area delineation resulted in the detection of no federal, state, or local jurisdictional inland or tidal wetland resources within the project area. Additionally, with the exception of the Thames River, no jurisdictional watercourses were identified within the SPII site.

Although no jurisdictional wetlands are located within the SPII site, a small tidal wetland was identified immediately south of the Thames River Boat Launch. This wetland is dominated by common reed (*Phragmites australis*) and includes several marsh elder (*Iva frutescens*), and sea myrtle (*Baccharis halmifolia*) shrubs. This wetland was not formally delineated because it is located outside of the SPII footprint. In the event that the SPII footprint is expanded to include the boat launch and/or Winthrop Point for mitigation purposes, the wetland will be revisited and formally delineated.

2.5 Soils

The State Pier Facility complex is underlain by three mapped soil units, as indicated in ***Figure 3***. These soil units include Urban Land, Udorthents-Urban land complex, and Hinckley loamy sand. None of these mapped soil units are hydric soils or prime farmland.

2.5.1 Udorthents-Urban land complex

The majority of the site is underlain by the Udorthents-Urban land complex. This soil unit consists of moderately well drained to excessively drained soils that have been disturbed by cutting or filling, and areas that are covered by buildings and pavement. The areas are mostly larger than 5 acres. The complex is about 70 percent Udorthents, 20 percent urban land, and 10 percent other soils. Most areas of these components are so intermingled that it was not practical to map them separately. Udorthents are in areas that have been cut to a depth of two (2) ft or more or are on areas with more than two (2) ft of fill. Udorthents consist primarily of moderately coarse textured soil material and a few small areas of medium textured material.

2.5.2 Urban Land

Land occupied by the State Pier and adjacent warehouse buildings located immediately to the north are mapped as Urban Land. This soil unit consists of nearly level to moderately steep areas where the soils have been altered or obscured by urban works and structures. Buildings and pavement cover more than 85 percent of the surface.

2.5.3 Hinckley Loamy Sand

The Hinckley series consists of very deep, excessively drained soils formed in glaciofluvial materials. They are nearly level through very steep soils on outwash terraces, outwash plains, outwash deltas, kames, kame terraces, and eskers. The saturated hydraulic conductivity is high or very high. Within the SPII site, these soils occupy an elevated area of the northeastern portion of the site which is currently used for a road salt stockpile and distribution area.

2.6 Upland Habitats

AECOM conducted a preliminary inventory of upland habitat on February 22, 2019. Based on this assessment, two dominant upland habitats were identified and include Industrial Developed Land and Deciduous Scrub-shrub Uplands.

2.6.1 Industrial Developed Land

The existing State Pier Facility is an active maritime port that receives shipments of bulk commodities including structural steel, lumber, road salt, paper, and pulp. Accordingly, space is at a premium and the vast majority of the complex consists of industrial developed land occupied by:

- Roadways;
- Warehouses and support buildings;
- Transit structures;
- Railroad tracks; and,
- Upland storage areas.

In general, industrial developed land includes impervious land surfaces such as asphalt or concrete pavement, compacted gravel, and buildings. Upland storage areas are used for temporary storage of a variety of commodities awaiting shipment off site, construction and industrial materials, vehicles, and heavy machinery.

Industrial developed lands provide very limited natural habitat value for native plant and wildlife resources. These lands may include sparse peripheral patches of weedy herbaceous and scrub/shrub vegetation, often comprised of low value or non-native/invasive species such as mugwort (*Artemesia vulgaris*), spotted knapweed (*Centaurea stoebe*), common reed (*Phragmites australis*), leafy spurge (*Euphorbia esula*), tansy (*Jacobaea vulgaris*), garlic mustard (*Alliaria petiolata*), multiflora rose (*Rosa multiflora*), honeysuckle (*Lonicera* spp.), tree-of-heaven (*Ailanthus altissima*), Asiatic bittersweet (*Celastrus orbiculatus*), and a variety of grasses/sedges adapted to thrive in disturbed sites.

2.6.2 Deciduous Scrub-shrub Uplands

Several small patches of deciduous scrub-shrub upland habitat are interspersed throughout the SPII site. This habitat generally occupies narrow strips of rocky/sandy upland areas adjacent to the waterfront, along fence lines, and other underutilized areas of the site such as behind buildings. The largest nearby contiguous scrub-shrub habitat patch is located adjacent to the northeastern corner of the site at Winthrop Point.

Vegetation within this habitat type consists of sparsely- to moderately-dense shrub-dominated uplands with few scattered trees and a varied herbaceous layer. Vegetation composition is typical of moderately dry, disturbed sites and may include numerous noxious/invasive species such as: tree-of-heaven, multiflora rose, Asiatiac bittersweet, poison ivy (*Toxicodendron radicans*), and honeysuckle.

2.7 Benthos

Benthos is the community of organisms that live on and in the sediments of aquatic environments. Benthic macroinvertebrates and shellfish communities present within SPII are discussed below.

2.7.1 Benthic Macroinvertebrates

Additional details regarding substrate composition and species composition are provided in the report summarizing the site-specific surveys completed in the summer of 2019. Results of these surveys are included as Attachment M1B.

2.7.2 Shellfish

According to the CT Department of Agriculture, Bureau of Aquaculture's (DA/BA) Aquaculture Mapping Atlas, commercial and recreational shellfish harvest is prohibited from the Thames River within and adjacent to the SPII site south of the Gold Star Bridge (CT DEEP, 2019). North of the bridge, select portions of the river (i.e. in Waterford, CT) are classified as conditionally restricted-relay and the majority of the river in the Project vicinity is classified as "prohibited" for shellfishing including the three New London-managed shellfish beds. As indicated in ***Figure 4***, no natural, recreational, state-managed shellfish beds are located within or adjacent to the SPII site. Definitions[2] of restricted relay and prohibited area shellfish classifications are presented below.

Restricted Relay – A shellfishing area classification where DA/BA allows aquaculture, relay or transplant activities in conformance to the National Shellfish Sanitation Program, Model Ordinance (NSSP-MO) criteria. Operations may be licensed to relay shellfish to designated beds in Approved or Conditionally Approved areas for natural cleansing.

These shellfish may not be directly harvested for market or consumed prior to a minimum purification period of 14 consecutive days after being relayed to Approved or Conditionally Approved "open" areas with a water temperature of 50 degrees Fahrenheit (10 degrees Celsius) or greater. DA/BA may require

[2] Definitions per CTDEEP Shellfish Area Classification Polygon metadata: http://www.cteco.uconn.edu/metadata/dep/document/SHELLFISH_AREA_CLASS_POLY_FGDC_Plus.htm

the shellfish purification time to be longer than 14 consecutive days, based upon shellfish purification verification studies.

This classification requires a sanitary survey and collection of water quality data. A minimum of five (5) seawater samples from each station must be collected annually during adverse pollution conditions.

Prohibited – A shellfishing area classification which does not conform with other NSSP-MO classification criteria. This classification prohibits the harvesting of shellfish for any purpose except depletion or aquaculture operations (such as seed oystering) licensed by the DA/BA.

A prohibited shellfish growing area is closed for the harvesting of shellfish (except licensed aquaculture operations) at all times. This classification may be assigned to specified areas with direct exposure to fecal, industrial or environmental contamination to the extent that the consumption of shellfish harvested in the area may be potentially hazardous to health after a shellfish purification (relay) period of less than six (6) months are classified "Prohibited". Aquaculture operations may be suspended for such areas.

Areas with incomplete sanitary surveys, including lack of water quality data analysis, lack of a complete shoreline survey, or when the area does not conform to the requirements for the classification of a Restricted-Relay area or better also require this classification.

Environmental contamination may also include specified areas in which shellfish contain 80 micrograms or greater of paralytic shellfish poisoning toxin per 100 grams of shellfish meat, contain other unacceptable levels of marine biotoxins, or contain unacceptable levels of poisonous or deleterious substances or organisms are classified as prohibited when such events are constant or reoccurring. Aquaculture operations may be suspended for such areas.

2.8 Finfish

Extensive finfish monitoring and surveys have been conducted in the Thames River in the vicinity of the State Pier Facility. A subset of these surveys include biological sampling conducted by the United States Coast Guard Academy (USCGA) since 1974, an ongoing alosine survey conducted by CT DEEP since 1996, and a comprehensive finfish and ichthyoplankton (egg and larval life stage) survey of the waters adjacent to the Naval Submarine Base New London (SUBASE-NLON) conducted in 2014-2015. Data obtained from these surveys offer a representative characterization of the finfish community likely to utilize the waters of the SPII site.

According to the CT DEEP, New London Harbor serves as both nursery habitat and migratory corridor to several alosine species including American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), and blueback herring (*Pomolobus aestivalis*) (Gephard, 2019). These species are subject to an intensive restoration program in the Thames River Basin, including dam removal/fish passage projects that allow these species to reach spawning habitat.

2.8.1 USCGA Survey

The USCGA marine science class has performed biological sampling of the river from the Gold Star Bridge upriver to the Naval Submarine Base New London (SUBASE-NLON) facility since 1974. The ongoing survey utilizes a flat trawl net at shallow (15-30 ft) and deep (40-50 ft) depths and is conducted on a weekly basis from August to October. In addition to river trawls, seining is conducted in shallow subtidal areas.

A summary of fish species by ecological niche and habitat preference guilds collected as part of the USCGA surveys is presented in Table 1.

Table 1. Fish Species Guilds Established for the USCGA Survey Data

Guild	Meaning	Species Included
CD	Cold Temperate-Demersal	Cunner, Hake (Silver), Stickleback, Tomcod
CE	Cold Temperate-Epibenthic	Fundulus-mummichog, Sculpin (Longhorn), Toadfish, Fourbeard Rockling, Flounder (Fourspot), Flounder (Windowpane), Flounder (Winter), Flounder (yellowtail), Hake (Red), Hake (White), Sculpin (Grubby), Searobin (Northern), Skate (little), Oyster Toadfish
CP	Cold Temperate-Pelagic	Mackerel (Atlantic), Alewife, Herring (Atlantic), Smelt
WD	Warm Temperate-Demersal	Gunnel, Smooth Dogfish, Silversides (tidewater), Blackfish (Tautog), Kingfish, Lizardfish, Mullet, Scup (Porgy), Seabass (Black), Sheepshead Minnow, Silversides (Atlantic), Spot, Weakfish
WE	Warm Temperate-Epibenthic	Cusk eel, Fundulus-killifish, Hake(Spotted), Pipefish, Seahorse (lined), Fundulus diaphanus (banded killifish), Lucania parva (rainwater killifish), Fundulus majalis (striped killifish), Hake (Spotted), Hogchoker, Northern Pipefish, Blowfish (N. Puffer), Eel (American), Flounder (Gulf Stream), Flounder (Smallmouth), Flounder (Summer), Goby, Searobin (Striped)
WP	Warm Temperate-Pelagic	Mackerel (Spanish), Anchovy, Bass (Striped), Bluefish, Butterfish, Herring (blue back), Jack (Crevalle), Menhaden, Shad (American)
SP	Subtropic-Pelagic	Big Eye, Lookdown, Moonfish
SD	Subtropic-Demersal	Banded Rudderfish

Source: CT DEEP, 2017.

A shift in species guilds has been observed over the span of the USCGA sampling program from cold temperate-epibenthic to warm temperate-epibenthic species. Specifically, windowpane (*Scophthalmus aquosus*) and winter flounder (*Pseudopleuronectes americanus*) dominated the catch during the early years of the survey and were replaced by summer flounder (*Paralichthys dentatus*), scup (*Stenotomus chrysops*), and butterfish (*Peprilus triacanthus*) in recent years (CT DEEP, 2017).

2.8.2 CT DEEP Alosine Seining Survey

The CT DEEP conducts an annual study of marine recreational fisheries in Connecticut. One component of the study is an alosine survey that typically includes biweekly seining in July and August between Uncasville and Norwich Harbor located north of the project area. This survey has been ongoing in the Thames River since 1996 through at least 2016.

Results of the 2014 to 2016 survey data indicates the number of species or taxonomic groups was comparable among years and ranged from 23 to 28 (Table 2). Atlantic menhaden (*Brevoortia tyrannus*), Atlantic silverside (*Menidia menidia*), killifish (*Fundulus spp.*), and bluefish (*Pomatomus saltatrix*) were the top five occurrences during these recent sampling events. Atlantic silverside had the highest overall occurrence during each year.

Table 2. List of fish species or Group and Percent Frequency of Occurrence of Fish Collected in Thames River Alosine Seine Survey, 2014-2016

Species	Scientific Name	2014	2015	2016
alewife	*Alosa pseudoharengus*	3.70	9.76	2.04
American eel	*Anguilla rostrata*		2.44	4.08
American shad	*Alosa sapidissima*		2.44	
Atlantic needlefish	*Tylosurus marinus*	3.70		
Atlantic silverside	*Menidia menidia*	92.59	92.68	95.92
bay anchovy	*Anchoa mitchilli*	3.70	12.20	4.08
blueback herring	*Pomolobus aestivalis*	7.41	2.44	4.08
bluefish	*Pomatomus saltatrix*	44.44	78.05	53.06
blue runner	*Caranx crysos*		2.44	
butterfish	*Peprilus triacanthus*	3.70		4.08
crevalle jack	*Caranx hippos*	3.70	7.32	
Atlantic croaker	*Micropogon unulatus*			4.08
cunner	*Tautogolabrus adspersus*			2.04
grubby	*Cottus aenaeus*	3.70		2.04
hogchoker	*Trinectes maculatus*	11.11	9.76	8.16
killifish & mummichog*	*Fundulus spp. & Lucania parva*	40.74	73.17	67.35
longhorn sculpin	*Myoxocephalus octodecemspinosus*	3.70		
lizardfish	*Synodus foetens*		24.39	2.04
Atlantic menhaden	*Brevoortia tyrannus*	51.85	53.66	44.90
naked goby	*Gobiosoma bosc*	11.11	9.76	10.20
northern kingfish	*Menticirrhus saxatilis*	3.70	21.95	10.20
northern puffer	*Sphoeroides maculatus*		2.44	
pipefish	*Syngnathus fuscus*		26.83	26.53
scup	*Stenotomus chrysops*	3.70	31.71	20.41
sheepshead minnow	*Cyprinodon variegatus*		2.44	2.04
spottail shiner	*Notropis hudsonius*	11.11	2.44	6.12
stickleback	*Apeltes quadracus*	11.11	12.20	2.04
striped bass	*Morone saxatilis*	3.70		14.29
summer flounder	*Paralichthys dentatus*	22.22	2.44	
sunfish*	*N/A*	3.70		2.04
tautog	*Tautoga onitis*	18.52	17.07	20.41
tomcod	*Microgadus tomcod*		2.44	
weakfish	*Cynoscion regalis*		7.32	
white perch	*Morone americana*		7.32	
white sucker	*Catostomus commersonii*		4.88	
winter flounder	*Pseudopleuronectes americanus*	14.81	26.83	12.24

* Indicates multiple species.
Source: CT DEEP 2017.

2.8.3 SUBASE-NLON Finfish Survey

A comprehensive survey was completed to characterize the finfish resources near the SUBASE-NLON in 2014-2015 (Tetra Tech, 2016). This program included deep channel trawl sampling and collection of ichthyoplankton (egg and larval life stage) samples. The purpose of the program was to assess juvenile and adult fish seasonal fluctuations in species composition and abundance.

Trawl surveys targeted adult and juvenile finfish life stages and were completed in water depths ranging from 30 to 39 ft. The trawls were conducted three times per season, for a total of 12 surveys between the fall of 2014 and summer of 2015. A total of 29 species were collected with seasonal variations in juvenile and adult composition observed (Table 3). Four species comprised over 75% of the catch and include bay anchovy (*Anchoa mitchilli*), scup, butterfish, and Atlantic herring (*Clupea harengus*). Summer flounder, winter flounder, and alewife were captured in three out of the four seasons. Trawls in the winter had the lowest diversity and catch per unit effort (CPUE); CPUE was highest in summer and diversity was highest in summer and fall (Tetra Tech, 2016).

Table 3. Seasonal Juvenile and Adult Finfish Relative Abundance and Species Composition SUBASE-NLON

Common Name	Scientific Name	Fall 2014	Winter 2015	Spring 2015	Summer 2015	Total Count	Total (% Comp.)
bay anchovy	*Anchoa mitchilli*	50	--	--	1,073	1,123	31.8%
scup	*Stenotomus chrysops*	299	--	--	269	568	16.1%
butterfish	*Peprilus triacanthus*	50	--	--	504	554	15.7%
Atlantic herring	*Clupea harengus*	--	--	182	228	410	11.6%
Atlantic moonfish	*Selene setapinnis*	176	--	--	123	299	8.5%
Atlantic silverside	*Menidia menidia*	--	6	--	169	175	5.0%
juvenile sciaenid	*Family Sciaenidae*	--	--	--	117	117	3.3%
bluefish	*Pomatomus saltatrix*	--	--	--	96	96	2.7%
winter flounder	*Pseudopleuronectes*	1	--	1	39	41	1.2%
alewife	*Alosa pseudoharengus*	32	1	--	1	34	1.0%
black seabass	*Centropristis striata*	24	--	--	--	24	0.7%
summer flounder	*Paralichthys dentatus*	13	--	3	3	19	0.5%
spotted hake	*Urophycis regia*	--	--	15	1	16	0.5%
Atlantic menhaden	*Brevoortia tyrannus*	--	--	--	14	14	0.4%
cunner	*Tautogolabrus adspersus*	--	--	5	1	6	0.2%
juvenile gadid sp.	*Family Gadidae*	--	--	6	--	6	0.2%
weakfish	*Cynoscion regalis*	6	--	--	--	6	0.2%
bluestripe lizardfish	*Synodus saurus*	4	--	--	--	4	0.1%
tautog	*Tautoga onitis*	3	--	1	--	4	0.1%
shorthorn sculpin	*Myoxocephalus Scorpius*	--	--	4	--	4	0.1%
northern pipefish	*Syngnathus fuscus*	4	--	--	--	4	0.1%
longfin squid	*Doryteuthis pealeii*	3	--	--	--	3	0.1%
Atlantic tomcod	*Microgadus tomcod*	--	--	1	--	1	T
fourspot flounder	*Paralichthys oblongus*	--	--	1	--	1	T
silver hake	*Merluccius bilinearis*	--	--	1	--	1	T

Common Name	Scientific Name	Fall 2014	Winter 2015	Spring 2015	Summer 2015	Total Count	Total (% Comp.)
smallmouth	*Etropus microstomus*	1	--	--	--	1	T
striped anchovy	*Anchoa hepsetus*	1	--	--	--	1	T
striped searobin	*Prionotus evolans*	--	--	1	--	1	T
windowpane	*Scophthalmus aquosus*	--	--	--	1	1	T
	Totals	**667**	**7**	**221**	**2,639**	**3,534**	

Note: T = trace (<0.1%).
Source: Tetra Tech 2016.

Ichthyoplankton samples were collected with a net (300 µm mesh) that was towed obliquely throughout the Thames River water column adjacent to the SUBASE-NLON. A total of 11 species were collected, with tautog (*Tautoga onitis*), Atlantic tomcod (*Microgadus tomcod*), winter flounder, American sand lance (*Ammodytes americanus*), Atlantic herring, and cunner (*Tautogolabrus adspersus*) comprising over 80% of the catch (Table 4). The winter, spring, and summer surveys resulted in fairly consistent CPUE, whereas the fall survey had the lowest CPUE. The spring survey resulted in the highest diversity with detection of eight (8) species. Summer and winter surveys resulted in detection of five (5) species whereas the fall survey resulted in only two (2) species.

Table 4. Ichthyoplankton Relative Abundance and Species Composition at SUBASE-NLON

		Density (per 100 m3 of river water)					
Common Name	Scientific Name	Fall 2014	Winter 2015	Spring 2015	Summer 2015	Total	Cumulative %
tautog	*Tautoga onitis*	-	-	5.5	8.2	13.7	19.7%
Atlantic tomcod	*Microgadus tomcod*	-	11.2	-	-	11.2	16.1%
winter flounder	*Pseudopleuronectes americanus*	2.5	1.0	7.2	-	10.7	15.4%
American sand lance	*Ammodytes americanus*	-	7.5	-	-	7.5	10.7%
Unknown egg	-	-	-	2.0	4.3	6.3	9.0%
Atlantic herring	*Clupea harengus*	1.7	-	4.3	-	6.0	8.6%
cunner	*Tautogolabrus adspersus*	-	-	0.7	4.6	5.3	7.6%
northern pipefish	*Syngnathus fuscus*	-	-	-	2.9	2.9	4.2%
grubby	*Myoxocephalus aenaeus*	-	1.4	0.7	-	2.1	2.9%
rock gunnel	*Pholis gunnellus*	-	1.9	-	-	1.9	2.8%
searobin sp.	*Family Triglidae*	-	-	-	1.5	1.5	2.1%
striped bass	*Morone saxatilis*	-	-	0.8	-	0.7	1.0%
Totals		4.2	23.0	21.2	21.5	69.7	100.0

Source: Tetra Tech, 2016.

2.9 Wildlife

Wildlife utilizes terrestrial uplands, intertidal areas, and open-water portions of the SPII site throughout the year. The avian species assemblages present with the seasons. Terrestrial mammals, reptiles, and amphibian species are likely present year-round. Marine species also utilize the Thames River Estuary.

2.9.1 Terrestrial Wildlife

Due to the developed nature of the SPII site and limited availability of natural habitat, relatively few terrestrial wildlife species likely utilize the area as breeding grounds. Species present or likely to utilize the site include those which have adapted to live in developed areas and are not easily disrupted by human activities. In addition to resident terrestrial wildlife, patches of scrub-shrub habitat may be utilized for short periods of time by a variety of bird species during spring and fall migratory periods for foraging or resting. Table 5 provides a list of terrestrial wildlife that may utilize the SPII site.

Table 5. Potential Terrestrial Wildlife Utilizing the Upland Portion of the SPII Site

Common Name	Scientific Name
Reptiles/Amphibians	
Garter Snake	*Thamnophis sirtalis sirtalis*
Fowler's Toad	*Anaxyrus fowleri*
American Toad	*Anaxyrus americanus*
Mammals	
Norway Rat	*Rattus norvegicus*
White-footed Mouse	*Peromyscus leucopus*
House Mouse	*Mus musculus*
Virginia Opossum	*Didelphis virginiana*
Gray Squirrel	*Sciurus carolinensis*
Raccoon	*Procyon lotor*
Birds	
Rock Pigeon	*Columba livia*
American Robin	*Turdus migratorius*
Northern Mockingbird	*Mimus polyglottos*
Song Sparrow	*Melospiza melodia*
European Starling	*Sturnus vulgaris*
House Sparrow	*Passer domesticus*

2.9.2 Avifauna

The assemblage of avifauna likely to utilize uplands, shoreline, and open water habitats of the SPII site includes a variety of passerines, wading birds, ducks, geese, and gulls. A list of birds for the New London Harbor birding "hotspot" generated from the publically-available bird sighting database and map viewer eBird (www.ebird.org) lists observations of 75 species (plus 9 other taxa) (Appendix A). The eBird database is a citizen-science project managed by the Cornell Lab of Ornithology.

Shorebirds and wading birds could use the rocky shoreline, beach areas, and shallow nearshore waters for foraging during low tide. Examples of these species include spotted sandpiper (*Actitis macularius*), greater yellowlegs (*Tringa melanoleuca*), great blue heron (*Ardea herodias*), and green heron (*Butorides virescens*).

According to the US Fish and Wildlife Service (USFWS), the Thames River is a regionally significant habitat for migrating and wintering waterfowl (USFWS 1991). Species that use the river include relatively large numbers of canvasback (*Aythya valisineria*), American wigeon (*Anas americana*), American black duck (*Anas rubripes*), gadwall (*Anas strepera*), mallard (*Anas platyrhynchos*), redhead (*Aythya americana*), common goldeneye (*Bucephala clangula*), and hooded merganser (*Lophodytes cucullatus*). Also found in the river are common and red-breasted merganser (*Mergus merganser* and *M. serrator*, respectively), and greater and lesser scaup (*Aythya marila* and A. *affinis*, respectively). Mute swans (*Cygnus olor*) also nest and winter within the Thames River habitats.

Several species of gull and tern are highly likely to utilize open water areas for feeding and rafting. Representative species include laughing (*Leucophaeus atricilla*), ring-billed (*Larus delawarensis*), herring (*Larus smithsonianus*), and great black-backed (*Larus marinus*) gulls and common tern (*Sterna hirundo*). Gulls will also use nearshore and intertidal areas in search for food and roosting/resting areas.

Osprey (*Pandion haliaetus*) are known to nest along the Thames River and use open water areas for fishing. No known osprey nests are located within or adjacent to the SPII site.

Peregrine falcons (*Falco peregrinus*) have nested on the Gold Star Bridge, located immediately north of the SPII site. This species may hunt for passerine birds, gulls, ducks, and pigeons within the SPII site.

2.9.3 Sea Turtles

Four species of marine sea turtles are known to occur in LIS off the coast of Connecticut (CT DEEP, 2011). These species include the leatherback (*Dermochelys coriacea*), Kemp's ridley (*Lepidochelys kempii*), green (*Chelonia mydas*), and loggerhead (*Caretta caretta*) sea turtles. All sea turtles are protected under federal and state statues.

Sea turtles visit Connecticut's estuarine and marine waters in early summer as water temperatures rise and generally migrate south by mid-November in search of warmer waters (CT DEEP, 2015). Sea turtles may utilize the Thames River estuary but are more likely to be found offshore in LIS.

2.9.4 Marine Mammals

Marine mammal sightings in Connecticut are a rare event (CT DEEP, 2015). However, several cetacean (whales, dolphins) and pinnipeds (seals) are known to occur and/or visit in the state. Suitable habitat for these animals is not present within or adjacent to the SPII site and any occurrence of marine mammals is highly unlikely.

2.10 Connecticut-listed Species of Concern

A request for Natural Diversity Data Base (NDDB) State Listed Species Review was initiated with CT DEEP in January 2019. NDDB determination No. 201901490, issued March 19, 2019, indicated CT DEEP has extant records for State Threatened peregrine falcon and State Special Concern blueback herring that occur in close proximity to the SPII site (McKay, 2019).

AECOM submitted a draft Peregrine Falcon Protection Plan to NDDB on June 25, 2019 and finalized this document on July 2, 2019 after discussions with NDDB personnel. NDDB personnel issued a letter expressing their concurrence with the proposed Peregrine Falcon Protection Plan measures on July 22, 2019. This documentation is included in JPA Attachment C.

2.10.1 Peregrine Falcon

The peregrine falcon has adapted to life in urban settings and is associated with bridges and buildings for nesting and brood rearing purposes. The peregrine is Connecticut's largest falcon and can measure up to 20 inches in length. Adult peregrines are slate gray above and pale underneath with fine bars and spots of black; the bird has long pointed wings and a narrow tail. Young falcons have the same composite, but are browner overall with a darker belly. The peregrine falcon nesting season occurs between the months of April and June. Adult peregrines will actively and aggressively defend its nest site up to, and sometimes past, 75 yards.

To protect nesting peregrine falcons, the CT DEEP recommends construction be completed during non-nesting season months (July-March). If work needs to be conducted during the nesting period (April 1st through June 30th, annually), CT DEEP also recommends that Project ornithologist should evaluate and prepare a protection plan for the birds.

In the Peregrine Falcon Protection Plan approved on July 22, 2019 by CT DEEP, it states all work must maintain a minimum buffer of 300 ft from an active falcon nest site. Therefore, in the event an active falcon nest is confirmed proximal to active construction, under the full-time supervision of a qualified

wildlife biologist/ornithologist, CPA proposes to allow construction activities to proceed to within 300 feet of any active peregrine falcon nest site. If it is determined by the biologist, through observation of falcon behavior, that construction activity may be negatively impacting the birds in any way, the full 600-feet of buffer will automatically go into effect, with the exception of "pass-through" construction vehicle traffic.

As noted above, peregrine falcons have previously been noted nesting on the Gold Star Bridge, located immediately north of the State Pier Facility.

2.10.2 Blueback Herring

The blueback herring is an anadromous fish species with a native range along the Atlantic coast of Canada and the United States from Nova Scotia to Florida. Blueback herring have an overall silvery appearance with a characteristic deep bluish-green back and deeply forked tail. Blueback herring primarily feeds on zooplankton and small fish, may reach a maximum length of approximately 16 inches, and live up to 8 years. Blueback herring live in marine systems and migrate to deep, swift moving freshwater rivers to spawn in the spring. During spawning, eggs are deposited over hard bottom substrate, where they stick to gravel, stones, rocks, and other objects. Depending on water temperature, eggs hatch within a few days and larvae quickly develop into juvenile fish which may migrate out to sea when about a month old.

Due to significant declines in anadromous populations of blueback herring and alewife, the Connecticut Department of Environmental Protection (CT DEP) issued an emergency fishery closure in April 2002, which remains in effect in 2019. Potential causes of the declines to the fishery include several factors such as loss of spawning habitat, impediments to migration, fishing, and predation due to the recovering striped bass (*Morone saxatilis*) population.

2.11 Federally-listed Species of Concern

The U.S. Fish and Wildlife Service (USFWS) was consulted to identify any threatened, endangered, proposed and candidate species as well as proposed and final designated critical habitat that may occur within the project area pursuant to Section 7(c) of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 *et seq*). The Information for Planning and Consultation (IPaC) report (Appendix B) generated from the query resulted in the identification of three federally-listed species that may occur within the SPII site, and are discussed below. No proposed or final critical habitats were identified within the SPII site.

2.11.1 Northern Long-eared Bat

The Northern long-eared bat (*Myotis septentrionalis*) is listed as a threatened species under the federal ESA and an endangered species under the Connecticut ESA. It is a medium-sized insectivorous bat about 3-3.7 inches from head to tail with a wingspan of 9-10 inches and brown fur. As its name suggests, its distinguishing characteristic is long ears. As with most insectivorous North American bats, the Northern long-eared bat forages on flying insects using echolocation.

Northern long-eared bats spend winter hibernating in caves, mines, and tunnels, typically those with large passages, relatively constant and cool temperatures, high humidity, and no air currents (USFWS, 2013). Individuals often attach to hibernaculum ceilings in small crevices, drill holes, or other sites.

During the summer, Northern long-eared bats roost singly or in colonies underneath bark in cavities or crevices of live and dead trees. Maternity colonies generally consist of 30 to 60 females and young utilizing trees or snags with cavities or loose bark in upland forests. Females give birth to a single pup in early summer; the young are ready to fly within three weeks. Males and non-reproductive females may roost and forage within areas adjacent to maternity colonies, but may also be solitary. Northern long-eared bats may utilize man-made structures such as barns and sheds as daytime roosts.

According to the CT DEEP, the City of New London is not an area which supports any known Northern long-eared bat hibernacula (CT DEEP, 2016). In addition, no suitable summer roost trees or maternity trees exist within or adjacent to the SPII site. Accordingly, Northern long-eared bats are unlikely to utilize the SPII site for roosting or maternity purposes.

2.11.2 Roseate Tern

The roseate tern (*Sterna dougallii dougallii*) is listed as an endangered species under both the federal ESA and Connecticut ESA. The roseate tern is a medium-sized white and light gray-backed tern with a black bill (has a reddish base), black head cap, orange feet and legs, and deeply forked tail. During the breeding season, the amount of red/pink at the base of the bill increases and a pink hue may be visible on the bird's breast. The roseate tern inhabits saltwater coastlines and feeds almost exclusively on small fish.

The northern population of roseate terns nests in colonies on sand/gravel beaches or pebbly/rocky offshore islands along the Atlantic coast from Nova Scotia to Long Island. Roseate terns arrive from their tropical wintering grounds to breeding areas in Connecticut in late April and May. Eggs are laid in shallow scrapes and sometimes lined with dried grasses. Chicks hatch following an incubation period of 23-24 days and young birds subsequently fledge within 26-30 days of hatching. The third largest roseate tern colony in North America exists in Connecticut at Falkner Island, which is located in LIS approximately 30 miles southwest of New London. Several small islands in the New London area were occupied by roseate terns in the 1970s (CT DEP, 1999). A review of the eBird database indicates several sightings of roseate terns in New London Harbor in 2018.

No potential nesting habitat is located within the SPII site. Sightings of roseate terns near the SPII site can be expected, as this species is highly mobile and individuals will follow and hunt schools of small fish in estuarine waters.

2.11.3 Small Whorled Pogonia

The small whorled pogonia (*Isotria medeoloides*) is listed as a threatened species under the federal ESA and an endangered species under the Connecticut ESA. The small whorled pogonia is a grayish-green orchid that grows about 10 inches tall when in flower and about 14 inches tall when in fruit. It has a whorl of five or six leaves near the top of the stem below its flower.

The small whorled pogonia grows in older hardwood stands with an open understory on acidic soils with a thick layer of dead leaves. It is often found on slopes near small streams.

No suitable habitat for the small whorled pogonia exists within the SPII site. Accordingly, this plant is highly unlikely to be present on the SPII site.

3.0 References

AECOM. 2018. DRAFT Investigation Report for State Pier Sediment Program – Thames River New London Connecticut. December 2018.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater. Habitats of the United States. FWS/OBS-79/31, 131p.

CT DEP. 1999. Wildlife in Connecticut Endangered and Threatened Species Series Roseate Tern (*Sterna dougallii*). https://www.ct.gov/deep/lib/deep/wildlife/pdf_files/outreach/fact_sheets/rtern.pdf. Accessed March 28, 2019.

CT DEEP. 2011. Wildlife in Connecticut Notebook: Sea Turtles. Connecticut Wildlife. Volume 31, Number 6, 17-18. https://www.ct.gov/deep/lib/deep/wildlife/pdf_files/outreach/connecticut_wildlife_magazine/cwnd11.pdf#page=17. Accessed March 28, 2019.

CT DEEP. 2015. 2015 Connecticut Wildlife Action Plan. Prepared by Terwilliger Consulting, Inc. for Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources. Accessed March 28, 2019.

CT DEEP. 2017. A Study of Marine Recreational Fisheries in Connecticut. https://www.ct.gov/deep/lib/deep/fishing/publications/2016_marine_fisheries_study_of_marine_recreational_fisheries_in_connecticut.pdf. Accessed March 26, 2019.

CT DEEP. 2019. Connecticut Environmental Conditions Online. *The Aquaculture Mapping Atlas.* https://cteco.uconn.edu/viewer/index.html?viewer=aquaculture. Accessed March 1, 2019.

Gephard, S. 2019. "RE: State Pier Improvements, New London." CT DEEP Fisheries Supervising Fisheries Biologist email message to R. Laukaitis, P.E. of Martinez Couch & Associates, LLC. March 15, 2019.

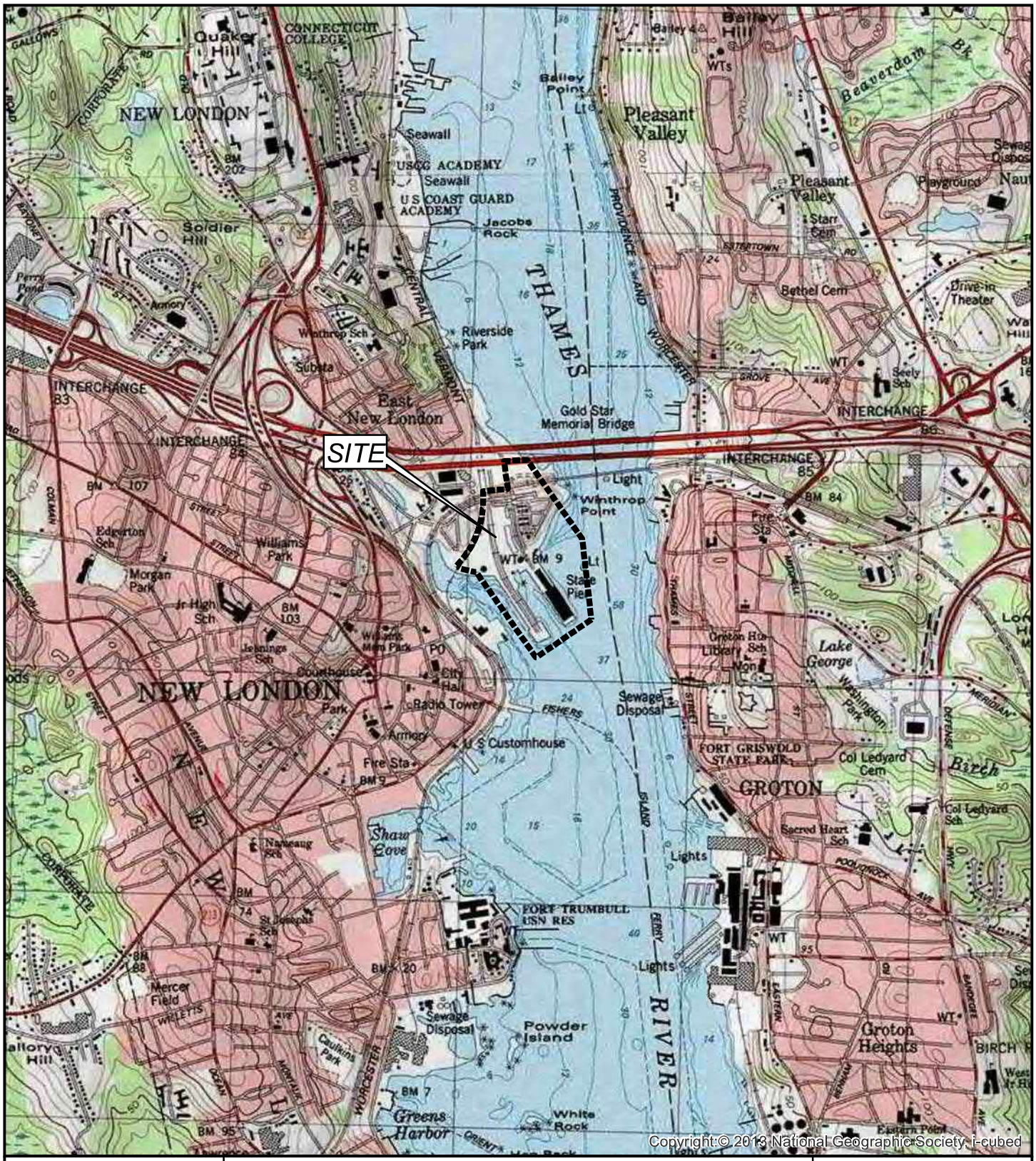
McKay, D.M. 2019. NDDB Determination No.: 201901490. CT DEEP Environmental Analyst 3 letter correspondence to R.E. Couch of Martinez Couch & Associates, LLC. March 19, 2019.

Tetra Tech, Inc. 2016. Nearshore Surveys at Naval Submarine Base (SUBASE) New London. Final Report. Task Order N62470-13-D-8016-WE08. Prepared for Naval Facilities Engineering Command Mid-Atlantic. April 2016.

USFWS. 1991. Final Report Northeast Coastal Study Areas Study: Significant Coastal Habitats of Southern New England and Portions of Long Island, New York. https://nctc.fws.gov/resources/knowledge-resources/pubs5/necas/begin.htm. Accessed March 28, 2019.

USFWS. 2013. 2 October 2013. 12-month finding on a petition to list the eastern small-footed bat and the northern long-eared bat as endangered or threatened species; listing the northern long-eared bat as an endangered species. Federal Register 78(191):61046-61080.

Figures



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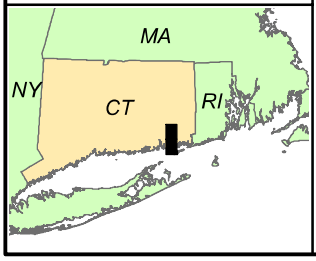

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Site Locus Map

State Pier Infrastructure Improvements
New London, Connecticut

0 1,000 2,000 4,000 6,000 Feet

0 0.125 0.25 0.5 0.75 Miles

Map Projection: State Plane, NAD 83, feet.
Image Source: USGS Topographic Quadrangle New London and Uncasville, CT.

AECOM

Figure 1

4/8/2019

Proj. #: 60579714

Map Location

Legend

- Tidal Wetland
- Beach
- Rocky Shorefront
- Developed Shorefront

Existing Coastal Resource Areas

State Pier Infrastructure Improvements
New London, Connecticut

0 30 60 120 Feet

N

AECOM

Figure 2

Sheet 1 of 3

5/1/2019

Map Location

Legend

- Tidal Wetland
- Beach
- Rocky Shorefront
- Developed Shorefront

Existing Coastal Resource Areas

State Pier Infrastructure Improvements
New London, Connecticut

0 90 180 360 Feet

N

AECOM

Figure 2

Sheet 2 of 3

5/1/2019

Map Location

Legend

- Tidal Wetland
- Beach
- Rocky Shorefront
- Developed Shorefront

Existing Coastal Resource Areas

State Pier Infrastructure Improvements
New London, Connecticut

0 30 60 120 Feet

N

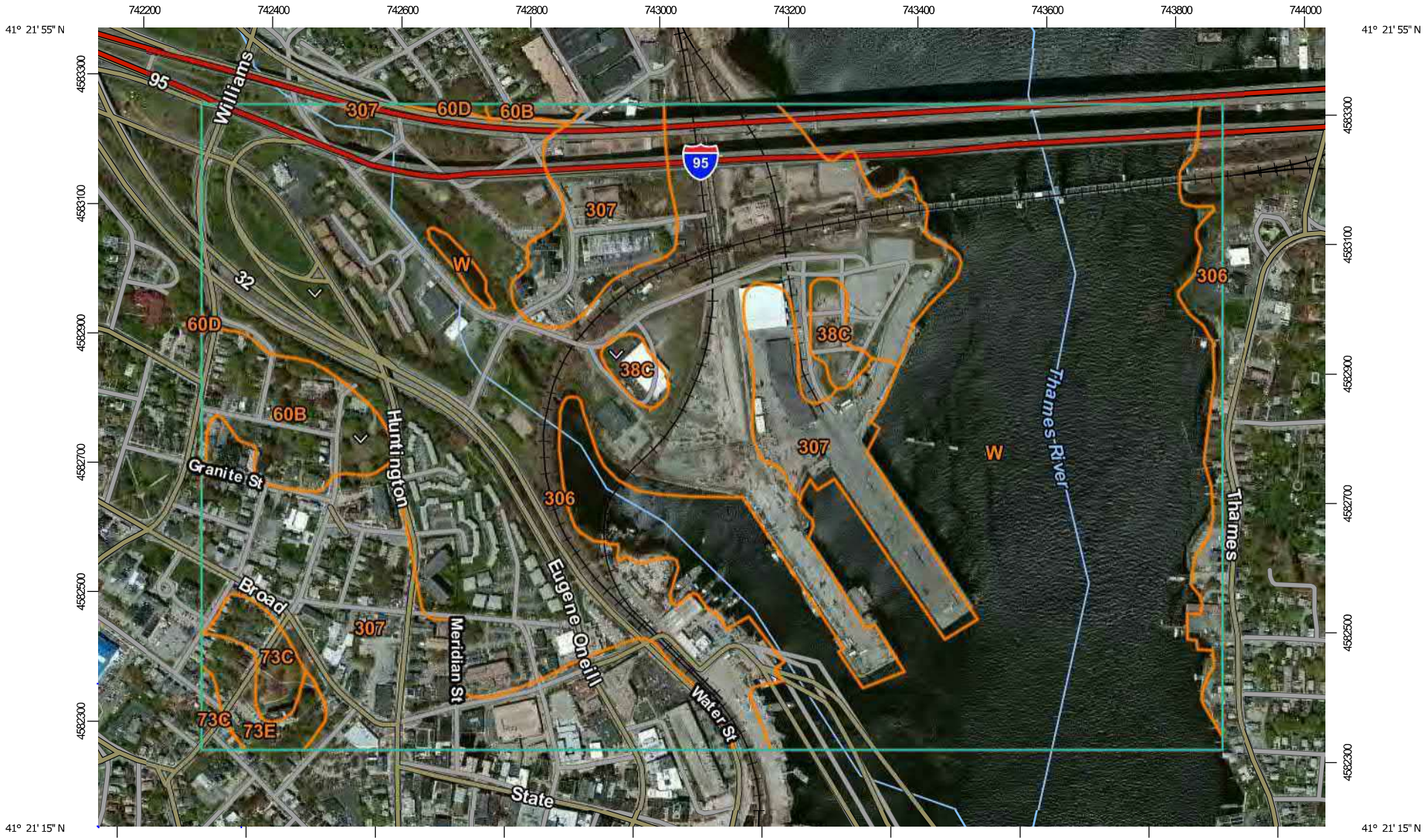
AECOM

Figure 2

Sheet 3 of 3

5/1/2019

Soil Map—State of Connecticut
(State Pier Infrastructure Improvements)



Map Scale: 1:8,700 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018

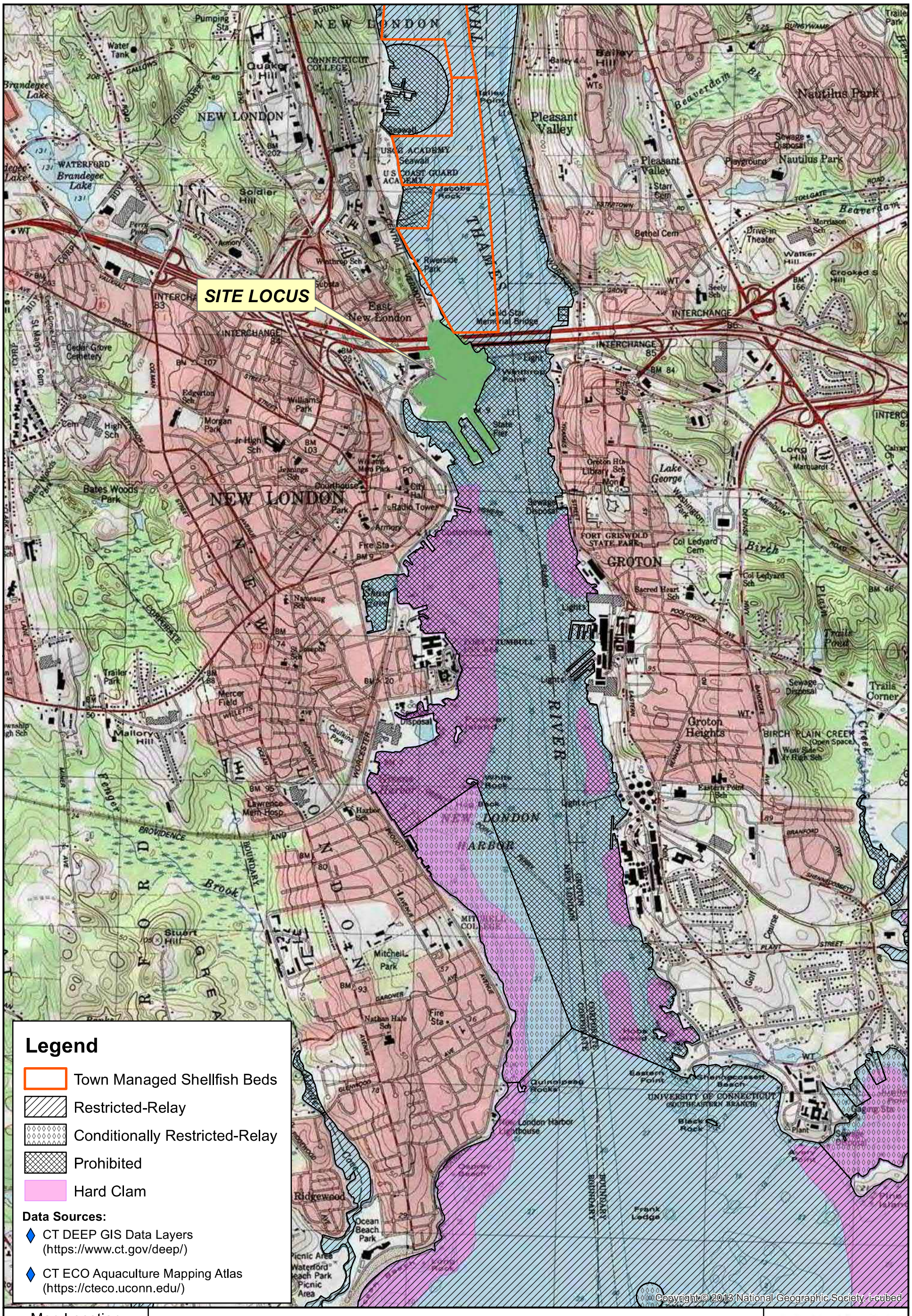
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

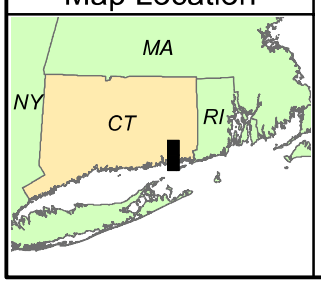
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
38C	Hinckley loamy sand, 3 to 15 percent slopes	4.1	1.1%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	12.5	3.2%
60D	Canton and Charlton soils, 15 to 25 percent slopes	0.4	0.1%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	4.5	1.1%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	4.2	1.1%
306	Udorthents-Urban land complex	152.6	39.0%
307	Urban land	70.4	18.0%
W	Water	142.6	36.4%
Totals for Area of Interest		**391.4**	**100.0%**



Map Location



Local Aquaculture Resource Areas

State Pier Infrastructure Improvements
New London, Connecticut

0 1,000 2,000 4,000 6,000 Feet

N

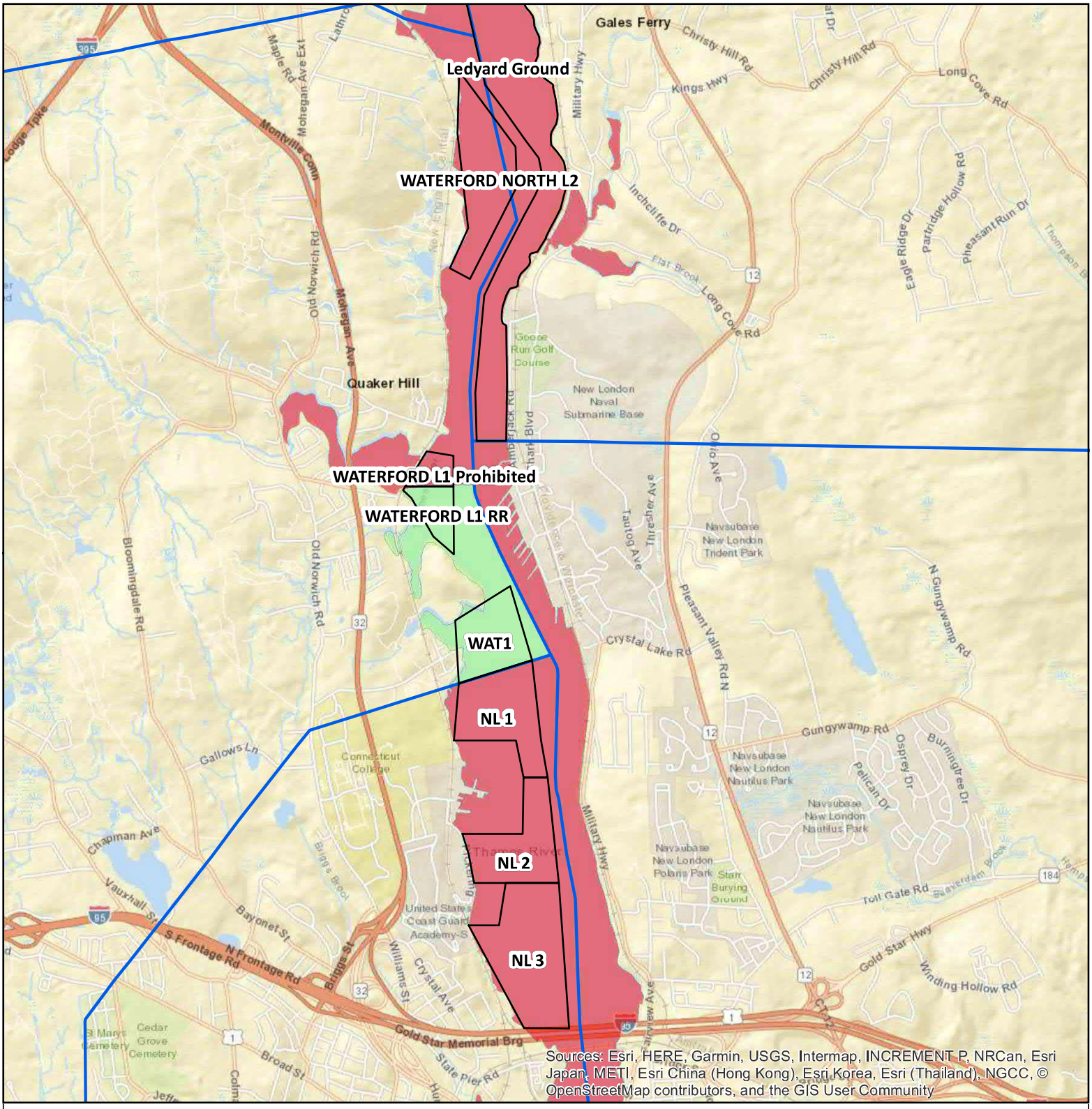
Map Projection: State Plane, NAD 83, feet.
Image Source: USGS Topographic Quadrangle New London and Uncasville, CT.

AECOM

Figure 4

5/1/2019

Proj. #: 60579714



CT Department of Agriculture
Bureau of Aquaculture
Thames River Beds

Date: 7/16/2019

BED_NAME	OWNER_NAME
NL 1	BRIARPATCH ENTERPRISES INC
NL 2	BRIARPATCH ENTERPRISES INC
NL 3	BRIARPATCH ENTERPRISES INC
WAT1	AEROS CULTURED OYSTER CO.
WATERFORD L1 Prohibited	AEROS CULTURED OYSTER CO.
WATERFORD L1 RR	AEROS CULTURED OYSTER CO.
WATERFORD NORTH L2	AEROS CULTURED OYSTER CO.

N

0 2,000 4,000 8,000 12,000 16,000 Feet

Shellfish Classification Area

- Shellfish Beds
- Town_Line

Classification

- Approved
- Conditionally Approved
- Conditionally Approved Seasonal
- Conditionally Restricted-Relay
- Restricted-Relay
- Prohibited

Appendix A

New London Harbor eBird Hotspot Observations

eBird Menu

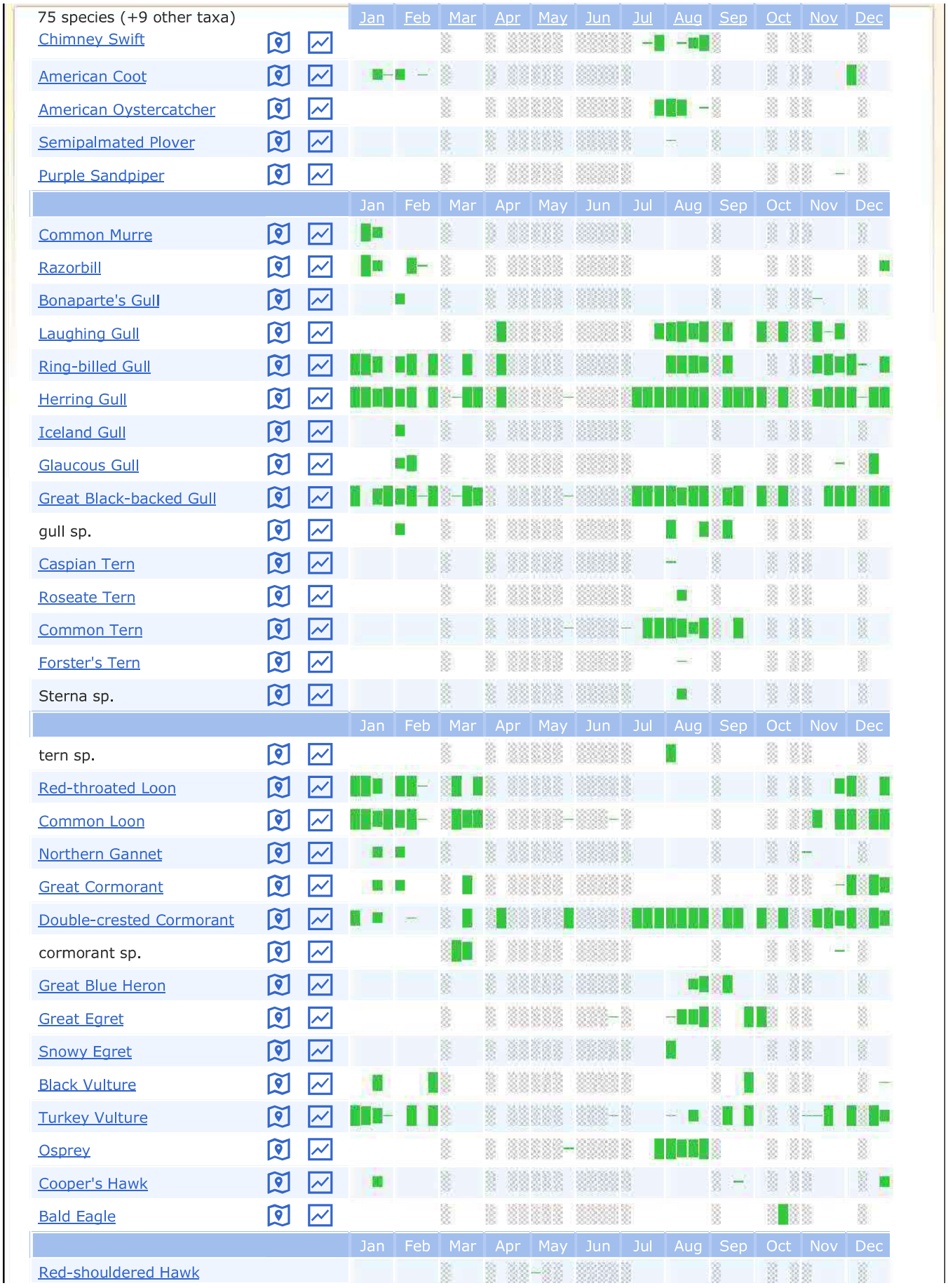
« Start Over

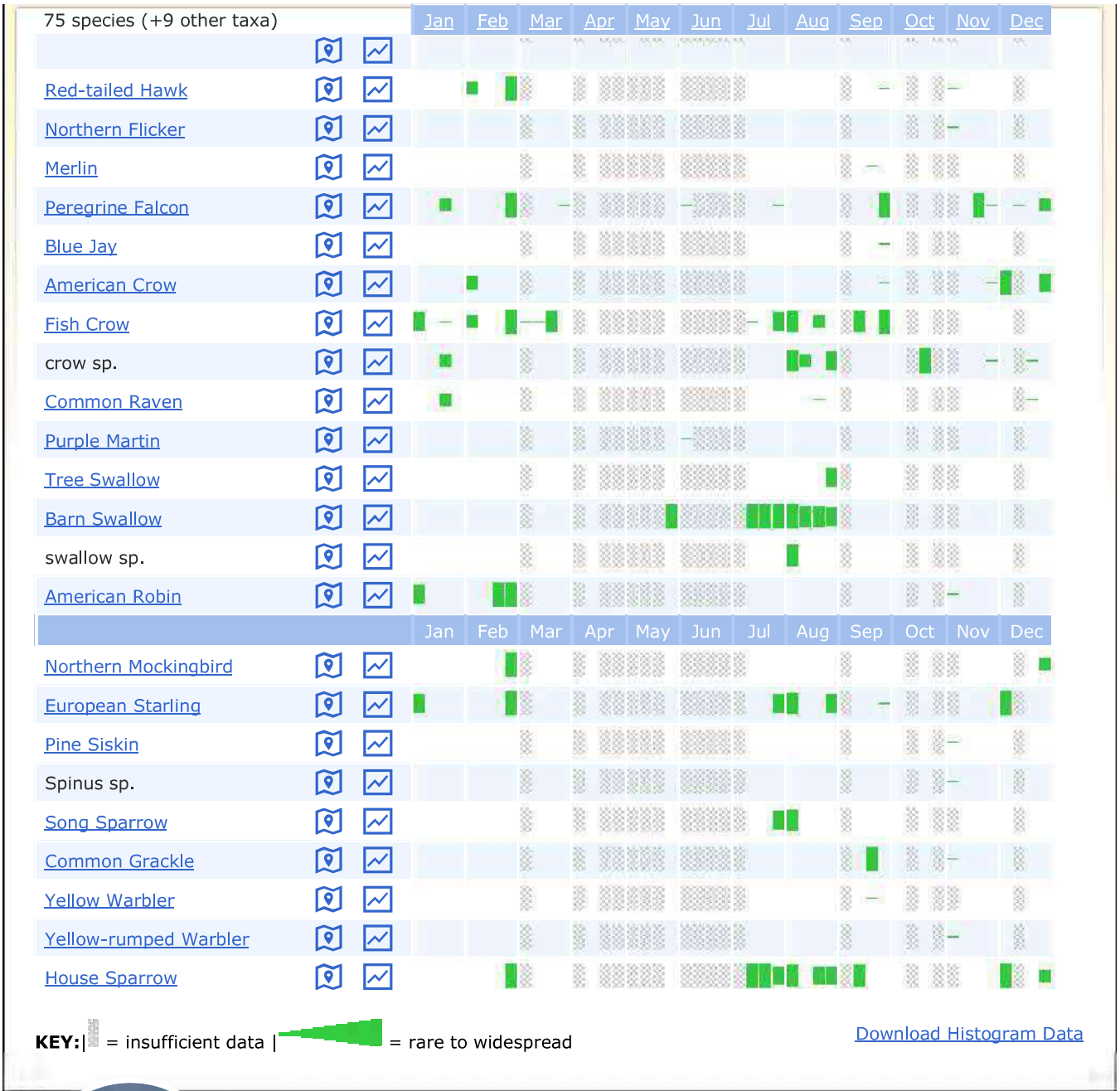
Bird Observations

Date Range: Change Date
Jan-Dec, 1900-2019

Change Location **New London Harbor**

75 species (+9 other taxa)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Brant												
Canada Goose												
Mute Swan												
Gadwall												
American Wigeon												
Mallard												
American Black Duck												
Greater/Lesser Scaup												
King Eider												
Common Eider												
Surf Scoter												
White-winged Scoter												
Black Scoter												
Long-tailed Duck												
Bufflehead												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common Goldeneye												
Hooded Merganser												
Common Merganser												
Red-breasted Merganser												
Ruddy Duck												
duck sp.												
Horned Grebe												
Red-necked Grebe												
Rock Pigeon												
Mourning Dove												


75 species (+9 other taxa)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Chimney Swift
American Coot
American Oystercatcher
Semipalmated Plover
Purple Sandpiper
Common Murre
Razorbill
Bonaparte's Gull
Laughing Gull
Ring-billed Gull
Herring Gull
Iceland Gull
Glaucous Gull
Great Black-backed Gull
gull sp.
Caspian Tern
Roseate Tern
Common Tern
Forster's Tern
Sterna sp.
tern sp.
Red-throated Loon
Common Loon
Northern Gannet
Great Cormorant
Double-crested Cormorant
cormorant sp.
Great Blue Heron
Great Egret
Snowy Egret
Black Vulture
Turkey Vulture
Osprey
Cooper's Hawk
Bald Eagle
Red-shouldered Hawk



Appendix B

USFWS Information for Planning and Consultation (IPaC) Report

See JPA Attachment M3