The Connecticut National Estuarine Research Reserve

Site Selection & Nomination Report

December 21, 2018

Connecticut Department of ENERGY & ENVIRONMENTAL PROTECTION

UCONN UNIVERSITY OF CONNECTICUT

Sea Grant Connecticut

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Dannel P. Malloy
GOVERNOR
STATE OF CONNECTICUT

December 21, 2018

The Honorable Timothy Gallaudet, Ph.D.
Rear Admiral, U.S. Navy (Ret.)
Acting Under Secretary of Commerce for Oceans and Atmosphere / NOAA Administrator
1401 Constitution Avenue, NW
Room 51030
Washington, DC 20230

RE: Connecticut National Estuarine Research Reserve Nomination

Dear Rear Admiral Gallaudet:

On behalf of the State of Connecticut, I am pleased to nominate a Connecticut site for inclusion in the National Estuarine Research Reserve (NERR) program. Please find the attached site nomination report for the details. After an extensive review process, the proposed site includes portions of the lower Connecticut River and eastern Long Island Sound and is comprised of the following state-owned land and water areas: Lord Cove Wildlife Management Area; Great Island Wildlife Management Area; Bluff Point State Park, Coastal Reserve and Natural Area Preserve; Haley Farm State Park; and the public trust portions of waterbodies defined by:

(a) Long Island Sound ranging approximately West to East from the mouth of the Connecticut River to Mason's Island, and ranging North to South waterward of the mean high water shoreline to just before the Connecticut/New York state boundary in Long Island Sound;
(b) the area waterward of the mean high shoreline of the lower Thames River from approximately the Gold Star Bridge ranging South to the area described in (a);
(c) the area waterward of the mean high shoreline of the lower Connecticut River from approximately Lord Cove ranging South to the area described in (a).

The proposed site will contribute significantly to the research, education, and natural resource stewardship goals of the national NERR program, and was selected to meet the guidelines of the National Oceanic and Atmospheric Administration's (NOAA) policy on NERR expansion. Establishing a NERR in Connecticut will:

- add value to the nationwide NERR system by siting a reserve in Long Island Sound, designated as an "Estuary of National Significance" by Congress in 1987 due to the critical natural resources, human uses, and economic drivers it supports;

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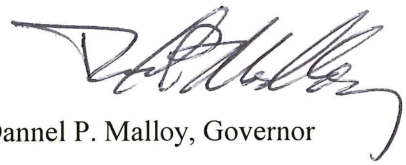
- bring the NERR System to a state not currently represented;
- strengthen existing, and create new, partnerships and programs for environmental stewardship, education and scientific research across private and public organizations at the local, state, regional, and federal levels; and
- add new and important estuarine habitats that are not currently represented by existing reserves in the Northeast.

The selection process identified the proposed site through a multi-year effort, examining more than two dozen locations and engaging individuals from a variety of state agencies, academic institutions, and non-governmental organizations. The site nomination effort was coordinated among staff from the Connecticut Department of Energy & Environmental Protection (DEEP), the University of Connecticut (UCONN) Department of Marine Sciences, and Connecticut Sea Grant (CTSG) who worked closely with NERR Program staff from the NOAA Office for Coastal Management (OCM) to ensure that the proposed site met or exceeded NERR program guidelines and state management needs. During the public engagement phases, local governments and numerous organizations at local and regional levels have expressed support for a Connecticut NERR. The proposed site would be managed by a partnership between UCONN and DEEP, and include opportunities to develop collaborations with other organizations where programmatic interests and expertise may align.

The State of Connecticut looks forward to your favorable review of this nomination and the beginning of a new partnership with your agency.

Sincerely yours,



Dannel P. Malloy, Governor

Cc: Connecticut Congressional Delegation
Commissioner Robert Klee, DEEP
Sylvain DeGuise, Ph.D., CTSG
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The Connecticut National Estuarine Research Reserve
Site Selection & Nomination Report:

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Submitted to:

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SIGNATURE OF APPROVAL:

Dannel P. Malloy, Governor

DEC 21, 2018

Date

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LIST OF ACRONYMS:

AIS	Automated Information System
CAM	Coastal Area Management
CCMA	Connecticut Coastal Management Act
CFR	Code of Federal Regulations
CGS	Connecticut General Statute
CLIS	Central Long Island Sound
CR	Coastal Reserve
CZMA	Coastal Zone Management Act
DEP	Department of Environmental Protection
DEEP	Department of Energy and Environmental Protection
DEIS	Draft Environmental Impact Statement
DMP	Draft Management Plan
ELIS	Eastern Long Island Sound
EIS	Environmental Impact Statement
GCN	Greatest Conservation Need
GIS	Geographic Information System
GPS	Global Positioning System
HMC	Harbor Management Commission
HMP	Harbor Management Plan
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
K-12	Kindergarten through twelfth grade
LIS	Long Island Sound
LISS	Long Island Sound Study
LWRD	Land and Water Resources Division
MP	Management Plan
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAP	Natural Area Preserve
NCA	National Coastal Assessment
NEP	National Estuary Program
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserve

NERRA	National Estuarine Research Reserve Association
NERRS	National Estuarine Research Reserve System
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
OCM	Office for Coastal Management
OLISP	Office of Long Island Sound Programs
ROD	Record of Decision
RTP	Roger Tory Peterson (Estuary Center)
SBM-NWR	Stewart B. McKinney National Wildlife Refuge
SLAMM	Sea-level Affecting Marshes Model
SC	Steering Committee
SCORP	State of Connecticut Outdoor Recreation Plan
SP	State Park
SST	Site Selection Team
SWMP	System-Wide Monitoring Program
TNC	The Nature Conservancy
UCONN	University of Connecticut
UNH	University of New Haven
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAP	Wildlife Action Plan
WLIS	Western Long Island Sound
WMA	Wildlife Management Area

ACKNOWLEDGEMENTS:

The Connecticut National Estuarine Research Reserve nomination is the culmination of several decades of hard work and commitment among a broad partnership of organizations and individuals.

The Connecticut Department of Energy and Environmental Protection, the University of Connecticut Department of Marine Sciences, and the Connecticut Sea Grant Program played key roles in organizing and leading the state effort. The Site Selection Team included dozens of individuals from various federal, state, academic, non-governmental, and other groups who – over the span of two years - donated considerable amounts of their time, resources, and expertise to help advance this nomination. Their dedication and professionalism were instrumental in successfully completing the site selection process. Federal staff from the National Program in the National Oceanic and Atmospheric Administration's Office for Coastal Management as well as staff from the Narragansett Bay Reserve in Rhode Island, the Hudson River Reserve in New York, and the Jacques Cousteau Reserve in New Jersey provided valuable guidance and insights on requirements, programming, and implementation.

The efforts of these parties not only demonstrate the strong support and enthusiasm for a Connecticut Reserve but also highlight the critical elements of the federal –state partnership approach that the Reserve System is founded upon.

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EXECUTIVE SUMMARY:

This document describes the effort to select and nominate a National Estuarine Research Reserve (NERR) for Connecticut. The NERR program is administered by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), as authorized under Section 315 of the Coastal Zone Management Act of 1972. The program's overall mission is to promote stewardship of the nation's estuaries through science and education using a system of protected areas. Estuaries are among the nation's most biologically rich and economically important ecosystems. These unique transition zones form where rivers meet the sea and Great Lakes. They provide social, economic, and environmental benefits for the entire country. These benefits, however, are dependent upon healthy, well-functioning estuarine habitats and the strong correlation between the health of estuaries and society's economic and social well-being means that coastal conservation is driven by both ecological and societal needs. Because estuaries are located in a highly dynamic environment with significant populations, commerce, and environmental change, they are also one of the most vulnerable ecosystems. Significant human and natural impacts threaten the important services they provide, requiring a science-based, integrated management approach to protecting estuaries, both today and for future generations. The National Estuarine Research Reserve System addresses this need by building federal, state, and community partnerships and promoting management and stewardship of our estuarine and coastal habitats through scientific understanding linked with public education. The reserves serve as laboratories and classrooms where the effects of both natural and human activity can be monitored and studied. Although the Reserve System is national in scope, individual sites are state-owned and managed, with oversight and coordination provided by NOAA. Funding for Reserves is supported through federal-state match, with NOAA providing 70% and the state providing a match of 30%. The system includes 29 Reserves within the United States and its territories, with Louisiana and Connecticut as the only salt-water coastal states lacking one.

The process for states to identify and establish a NERR involves the following steps:

Step 1: The state sends a letter to NOAA identifying its interest in developing a reserve program and nominating a site. NOAA will determine if they can support an expansion effort.

Step 2: If NOAA determines they can support the expansion, the state develops selection criteria and implements a process for selecting a site in consultation with NOAA and key

partners. The state must also ensure public input is received on the preferred site. The results are compiled into a site selection report.

Step 3: The governor submits the site-selection document and a nomination letter to NOAA. NOAA reviews the site-selection document and sends a letter to the governor accepting or rejecting the nomination.

Step 4: If NOAA accepts the nomination, the state, in collaboration with NOAA, prepares a draft and final management plan, including a MOU identifying state and NOAA roles in managing the reserve, and the appropriate memorandums of understanding among reserve partners establishing roles and responsibilities. NOAA, in coordination with the state, completes the requirements for Draft and Final Environmental Impact Statements.

Step 5: Upon successful completion of the management plan and Environmental Impact Statements, NOAA prepares designation papers and the reserve is officially designated.

In 2004, the state submitted a letter to NOAA seeking approval to begin the selection process. The materials herein represent the necessary requirements to fulfil Step 2 above. Subsequent steps will be addressed upon notification of NOAA's acceptance of this report.

Connecticut has a long history involving the interest and effort to secure a NERR originating within the offices of Connecticut's Coastal Zone Management Program within the Connecticut Department of Environmental Protection (DEP.) The Connecticut Coastal Zone Management Program evolved since its inception in the early 1980s as several organizational units within CTDEP, namely Coastal Area Management (CAM), the Office of Long Island Sound Programs (OLISP) and the Land and Water Resources Division (LWRD.) DEP itself reorganized during this process, becoming the Connecticut Department of Energy & Environmental Protection (DEEP)

Interest for a potential Reserve for Connecticut dates back to the 1980s. The current effort was initiated by OLISP and a letter from Governor M. Jodi Rell in 2004 and was approved by NOAA in 2006. Subsequently, LWRD engaged the assistance of the University of Connecticut (UCONN) Department of Marine Sciences and the Connecticut Sea Grant Program to assist in the selection effort. In 2012, recognizing the importance of Long Island Sound as a resource, members of the Connecticut Congressional delegation sent a letter to NOAA outlining their support for both coastal marine spatial planning efforts as well as the establishment of a NERR. (See Appendix 1 for copies of these letters.)

The process to select a site for a Connecticut NERR was developed jointly between DEEP, UCONN, Sea Grant and NOAA and employed an approach using the following teams:

- Steering Committee: The Steering Committee provided organizational oversight to ensure that process was compliant with NOAA procedures. It was comprised of staff from DEEP, UCONN Department of Marine Sciences and the Connecticut Sea Grant Program.
- Site Selection Team (SST): The SST was responsible for evaluating sites for a potential Connecticut NERR. The SST was comprised of two groups - a standing set of resource and subject matter experts from a variety of State agencies, academic institutions, and non-Governmental organizations ("core team"), and an ad-hoc array or external subject-matter experts engaged on an as-needed basis ("external experts.")
- Federal NERR Team: NOAA provided dedicated staff to function as a liaison between National NERR leadership and Connecticut. While not participating in any decision-making capacity, these staff provided general counsel/guidance.
- Regional NERR Team: Connecticut consulted representatives from existing Reserves in New York, Massachusetts, and Rhode Island. These individuals provided key operational knowledge regarding the management of a Reserve and implementation of required programs.

The SST performed a two-tier evaluation process. The first tier identified potential candidates to consider and then applied some basic screening assessments to yield three to five finalists. From a wide variety of options, the SST identified four sites (each 'site' is comprised of several state-owned upland properties, plus an offshore component of public trust waters.) Each site reflects a particular region of the Connecticut coastal area:

Western LIS (WLIS):

- U.S. Fish and Wildlife Service (USFWS) Stewart B. McKinney National Wildlife Refuge (SBM-NWR) properties on Sheffield, Chimon, & Goose Islands;
- DEEP Sherwood Island State Park;
- USFWS SB-NWR Great Meadows & Milford Point properties;
- DEEP Charles Wheeler Wildlife Management Area and water access at Stratford Point;
- An offshore area, that generally extends east to west from the Housatonic River to Long Neck Point, Darien and south to just shy of the Connecticut/New York state boundary.

Central LIS (CLIS):

- DEEP Hammonasset State Park and Natural Area Preserve;
- DEEP Hammock River Wildlife Management Area;
- DEEP Duck Island Wildlife Area;
- An offshore area that generally extends east to west from the Menunketesuck River, Westbrook to Meig's Point at Hammonasset State Park and south to just shy of the Connecticut/New York state boundary.

Connecticut River:

- Upper (Freshwater) Component
    - DEEP Machimoodus State Park;
    - DEEP Haddam Neck Wildlife Management Area
- Lower (Brackish) Component:
    - DEEP Lord Cove & Nott Island Wildlife Management Areas;
    - DEEP Ferry Point Wildlife Management Area;
    - DEEP Great Island Wildlife Management Area;
    - DEEP Ragged Rock Creek Wildlife Management Area;
    - DEEP Marine Headquarters;
- An offshore area that generally extends east to west from Hatchett Point, Old Lyme to Cornfield Point, Old Saybrook and south to just shy of the Connecticut/New York state boundary. The main stem of the Connecticut River, from just north of Haddam Neck Wildlife Management Area to the mouth is also included.

Eastern LIS (ELIS):

- DEEP Bluff Point State Park/Natural Area Preserve/Coastal Reserve;
- DEEP Haley Farm State Park;
- DEEP Barn Island Wildlife Management Area;
- Two offshore areas that:
    - Extend east to west from Groton Long Point, Groton to White Point, Waterford and south to just shy of the Connecticut/New York state boundary. The mouth of the Thames River served as the LIS/riverine boundary;
    - Includes Wequetequock River and the Connecticut portion of Little Narragansett Bay;

The second tier focused on evaluating the finalists based on detailed information and data on nearly three dozen individual criteria organized into the following categories that address the qualities and functional needs a Reserve must possess:

- Group 1: Environmental Representativeness:
- Group 2: Value for Research/Monitoring/Stewardship:
- Group 3: Value for Education and Training:
- Group 4: Acquisition/Management Aspects:
- Group 5: Site and Resource Resiliency:

After a thorough evaluation of the four sites the SST rated the ELIS site the highest, slightly edging out the Connecticut River site by just over one point. state-owned lands that developed at the end of the scoring exercise. Although the properties in question were not included in the NERR effort, there were substantial concerns regarding user conflicts within the DEEP Wildlife Division about supporting the inclusion of Barn Island Wildlife Management Area property, given its long history of and support for hunting. As a result of this, DEEP recommended removing Barn Island from consideration as part of the ELIS Site. While this substantially affected the highest scoring site, the top two sites scored very closely. As a result, DEEP asked the SST to consider a fifth option. This "hybrid" site consisted of properties combined from the ELIS and Connecticut River sites:

- Bluff Point State Park/Natural Area Preserve/Coastal Reserve;
- Haley Farm State Park
- Great Island Wildlife Management Area
- Lord Cove Wildlife Management Area
- An offshore area including the public trust waterbodies generally defined by:
  (a) Long Island Sound ranging approximately west to east from the mouth of the Connecticut River to Mason's Island and north to south waterward of the mean-high-water shoreline to just shy of the Connecticut state boundary in Long Island Sound;
  (b) the area waterward of the mean high shoreline of the lower Thames River from approximately the Gold Star Bridge south to the area described in (a);
  (c) the area waterward of the mean high shoreline of the lower Connecticut River from approximately Lord Cove south to the area described in (a).

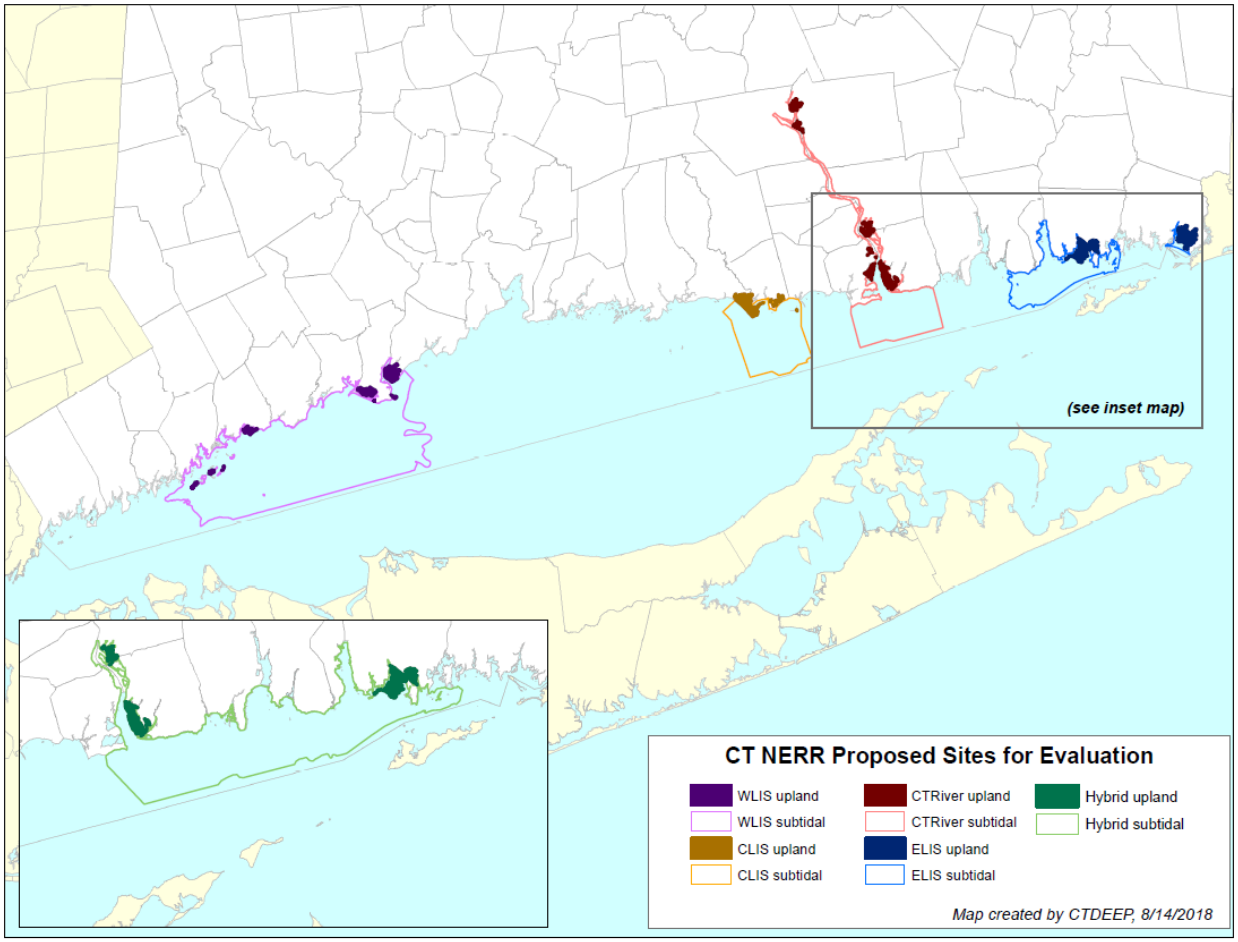


Figure 1: Map of the finalist sites evaluated for a Connecticut NERR.

In the revised evaluation the hybrid site received the highest overall score compared to the original four sites, and based on a review of the overall effort and results, the Steering Committee recommended the result as the nominee for a Connecticut National Estuarine Research Reserve.

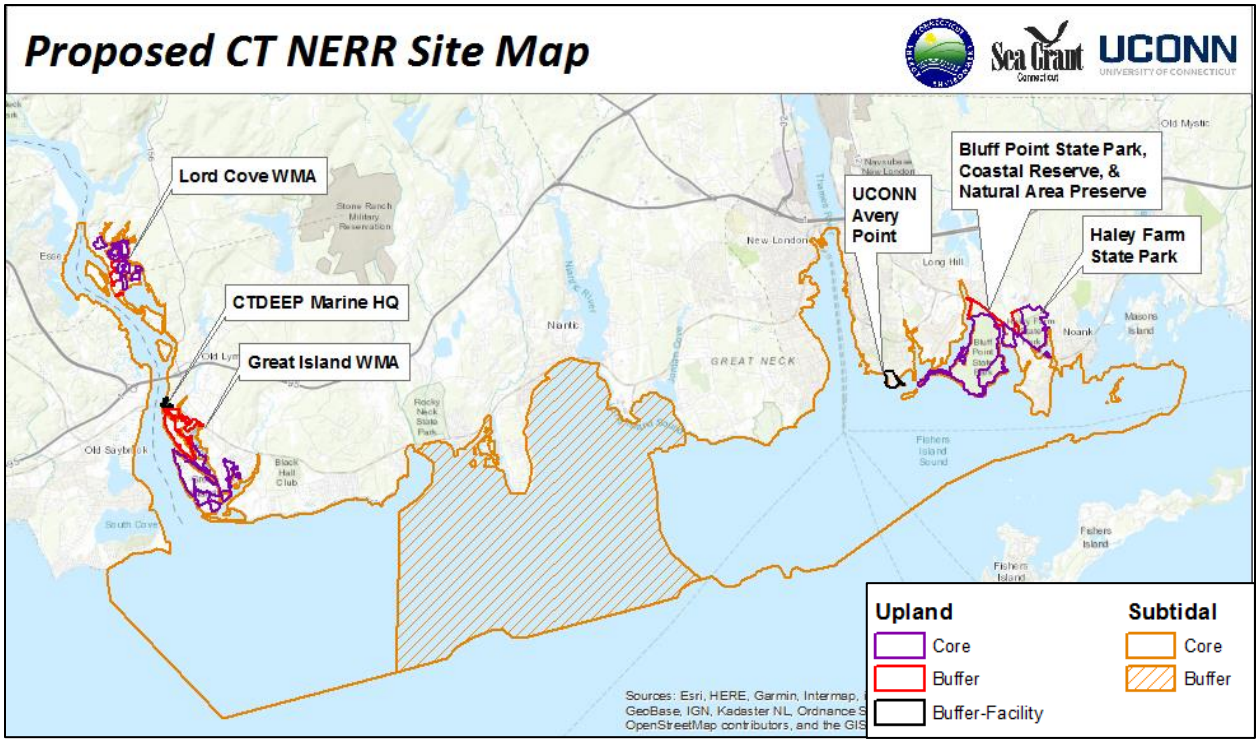


Figure 2: Map of the proposed Connecticut NERR.

Connecticut conducted a required public meeting to describe the site selection process and solicit comment and input from the general public. On November 13, 2018, approximately 175 people joined representatives from NOAA, CT DEEP, UCONN Department of Marine Sciences, and CT Sea Grant at the UCONN Campus at Avery Point in Groton. NOAA staff provided an overview of the Reserve system, and staff from DEEP detailed the site selection process and results to be nominated to NOAA. An hour long question and answer session solicited follow-up questions on implementation details as well as vocal support for the nomination.

This report synthesizes the details and outcomes of the selection effort and fulfils the NOAA requirement for states seeking to propose a NERR nomination.

Upon acceptance of the nomination by NOAA, the Steering Committee will coordinate the development a Management Plan for the operation of Reserve. They will also assist NOAA to carry out the required Draft and Final Environmental Impact Statement (EIS) requirements. As in the Site Selection phase, DEEP will assume the lead state role in carrying out the Connecticut's responsibilities in these tasks in close coordination with NOAA where required.

Existing ownership and primary oversight of the land and water areas will not change as a result of the designation of a Connecticut Reserve. The state parks, wildlife management areas, coastal reserves, and natural area preserves within the proposed Connecticut NERR will

continue to remain within DEEP. The facility areas of DEEP Marine Headquarters and the UCONN Avery Point campus will remain under the ownership and management of DEEP and UCONN, respectively. Management of the public trust waters and resources will remain under their current statutorily defined entities including, but not limited to DEEP, local shellfish and harbor management commissions, the Department of Agriculture/Bureau of Aquaculture, etc. Further, the establishment of a Reserve does not bring with it any new federal regulations. Although it requires the development of programs to advance its mission goals of science, monitoring, and environmental education and training, the uses of a Reserve's land and water areas are ultimately governed by *existing* state and federal laws, regulations, and policies.

The National Reserve system recognizes that there is no "one-size fits all" management model, and encourages states to seek structures that best leverage their own unique resources to support their Reserve's mission and goals. As such, responsibility for the overall management of the Connecticut Reserve will be finalized during the subsequent management planning steps. It is expected that regardless of which organization assumes the management capacity, both DEEP and UCONN will have formal roles to address the various research, education and resource management objectives of the NERR based on their assorted areas of expertise. These roles will be fully explored and defined during the subsequent phases, and once finalized, be codified via Memoranda of Agreement (MOA). A MOA will exist between the reserve management organization and NOAA, as will MOAs between DEEP and UCONN. Since the management planning phases will rely on external stakeholder review and input, it is possible that other parties may express an interest to support the Reserve. For example, organizations such as The Nature Conservancy and the Connecticut Audubon Society's Roger Tory Petersen Estuary Center - who were part of the Site Selection process – and/or other groups may wish to formally or informally engage with the Reserve in some fashion. As needed, these will be reviewed and addressed accordingly, via additional MOAs or other appropriate measures.

INTRODUCTION:

Overview of the National Estuarine Research Reserve (NERR) System

The National Estuarine Research Reserve System is a leader in estuarine research, stewardship, and education, fostering resilient coastal communities across the nation. Established by the Coastal Zone Management Act of 1972, as amended, the reserve system is a state-federal partnership between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. As of 2018, this partnership is 29 research reserves strong, protecting over 1.3 million acres of estuarine land and waters across the country for the purpose of advancing and applying knowledge of estuaries to improve coastal management and stewardship. These estuaries are relatively undisturbed and of strong ecological integrity. They represent the variety of habitats found across the nation, allowing for transfer of management approaches and protection strategies throughout the reserve system.

NOAA's Office for Coastal Management administers the program by providing guidance, coordination, technical assistance, and funding. State partners manage reserve resources, implement programs locally, and provide funds to match the federal investment.

It is important to note that Reserves do not bring or impose any new federal regulations – the uses of lands and waters in a Reserve are controlled by existing state regulations and policies.

Each reserve in the national system serves as a community center, promoting locally relevant, integrated approaches to coastal management. They do this by collaborating with stakeholders, scientists, land management professionals, and educators. In this way, NOAA and the reserves are local, regional, national, and, at times, international partners responding to coastal communities' most pressing management needs and emerging issues. The reserve system is an integral part of NOAA, helping to address priorities including stewardship, recreation, and tourism, preparedness and risk reduction, and safe and efficient transportation and commerce. In particular, reserves directly assist communities by bringing information and enhancing capabilities to help them prepare, respond to, and recover from immediate and potentially life-threatening events, such as hurricanes and long-term issues like recurrent flooding. Additionally, the reserves contain important natural, cultural, and historic resources that contribute to the coastal tourism and recreation industry.

The reserve system was founded on the principle that long-term protection of estuaries provides a stable platform for research, education, and management practices that will benefit the country's estuaries and coasts. Reserve staff possess expertise in research, education, training, and stewardship, working collaboratively as teams and with a variety of partners to address the complex coastal issues facing their communities. Nationally, the reserve system is unique in its approach to serving coastal community needs through its implementation of system-wide programs in monitoring, training, and education. This approach ensures consistent protocols and comparable outcomes applied at local, regional, and national scales, serving to better understand, protect, and manage estuarine systems. Currently, there are three system-wide programs: the System-Wide Monitoring Program, the Coastal Training Program, and the Teachers on the Estuary Program. The integration of locally relevant programs with system-wide approaches fosters innovation and allows for comparison of coastal conditions across the nation. This approach also ensures seamless delivery of NOAA products and services, and serves as a national platform for research and education. Both as a system and as individual reserves, the National Estuarine Research Reserves espouse common principles that serve to:

- Engage and inform local citizens, teachers, students, and communities in science-based stewardship of coastal estuaries and watersheds;
- Conduct high-caliber science and use science-based collaborative approaches to address complex coastal management problems;
- Create meaningful partnerships to enhance program success and estuary health;
- Lead by example through innovating, testing, and applying best management practices, planning approaches, and behaviors;
- Facilitate the use of best available science to make informed management decisions; and
- Seek to understand and utilize stakeholder needs to guide program implementation.[1]

NERR Program Policy for Adding New Systems

NERR sites are chosen to reflect regional variations and ecosystem types. The United States and its territories have been divided into areas termed "biogeographic regions." Connecticut lies within the Virginian Biogeographic region as defined by NOAA, encompassing the coastal areas

[1] NOAA NERR Strategic Plan 2017-2022: https://coast.noaa.gov/data/docs/nerrs/StrategicPlan.pdf

from Cape Cod, Massachusetts to Chesapeake Bay, Virginia (areas three through five on Figure 3.) Biogeographic regions are further classified into sub-regions; the Southern New England sub-region (area 3 on Figure 3) ranges from Cape Cod, Massachusetts to Sandy Hook, New Jersey.

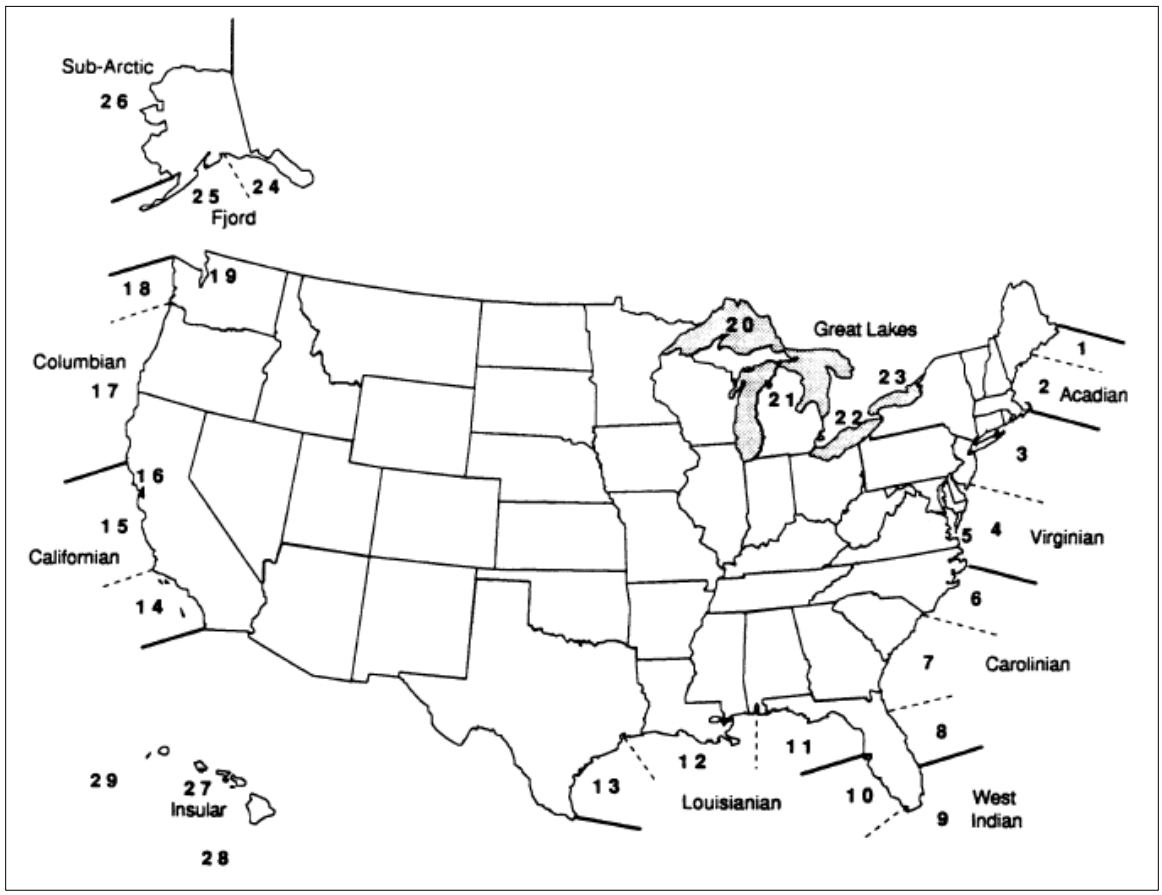


Figure 3: Biogeographic regions (named) and sub-regions (numbered) of the NERR system.

Estuaries can exhibit a variety of different characteristics – the NERR program refers to these differing characteristics as "typologies" and are codified in CFR Title 15, Vol.3, Part 921, App. II[2]. There are currently 29 established sites in the NERR system (Figure 4).

[2] NERR Typologies: https://www.gpo.gov/fdsys/pkg/CFR-2014-title15-vol3/pdf/CFR-2014-title15-vol3-part921-appII.pdf

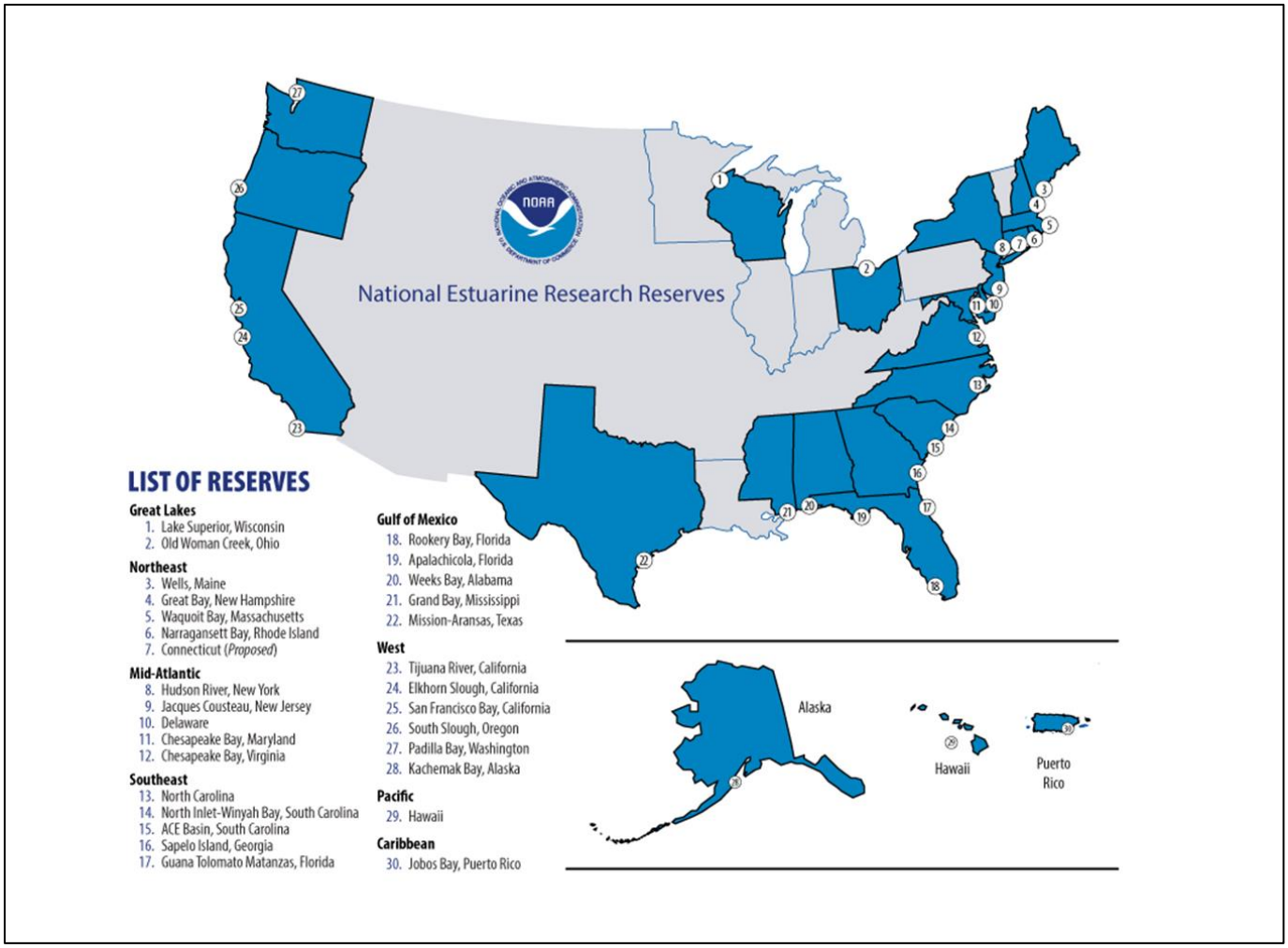


Figure 4: The NERR system as of 2018.

The concept of biogeographic regions and typologies play a critical role in how NOAA manages the NERR system. NOAA's policy for managing existing and establishing new reserves is:

1. NOAA is committed to completion of a system of reserves representing the diverse biogeographic and typological character of the estuaries of the U.S. and estuarine-like systems of the Great Lakes;
2. The first priority for use of NOAA funding is to support the operation of designated reserves, system-wide projects benefitting designated reserves, and development of reserves in states that currently have a formal commitment from NOAA to proceed with the designation process;
3. Additional reserves (beyond the existing 29 designated reserves) will be considered by NOAA only when:

   a. sufficient funds are appropriated to provide new reserves continuing operations support after designation;
   b. and sufficient federal staff and resources are available to adequately support new designation and operation activities;
4. Priorities for accepting new nominations are:
   a. First priority will be given to nominations that incorporate both a biogeographic sub-region and an estuary type not represented by existing or developing reserves (see NOAA regulations at 15 CFR.921).
   b. Second priority will be given to nominations that incorporate either a biogeographic sub-region and an estuary type not represented by existing or developing reserves.
   c. Third priority will be given to nominations within the already represented sub-region that do not add a new estuary type to the system, but add significant research and educational assets to the system.

Understanding the distinction of biogeographic regions and typologies is important as there are already three NERR sites in the Southern New England sub-region: Hudson River, New York, Narragansett Bay Rhode Island, and Waquoit Bay Massachusetts. As a result, the Connecticut selection process evaluated and identified typological elements that were currently not represented in the neighboring reserves.

Rationale for Establishing a Connecticut NERR

Long Island Sound (LIS, or the Sound) is among the most important and valuable estuaries in the nation, a fact made clear in 1987 when Congress designated the Sound an "Estuary of National Significance." It supports over 1,200 species of invertebrates, 170 species of fish, and has recently been calculated to generate about $9.4 billion annually via activities that use and depend on its waters, living resources, and habitats.[3] The Sound, like other estuaries around the country, is constantly threatened by development, pollution, invasive species, competitive uses, and the effects of climate change–to name only a few. These and other threats make it more important than ever to have access to current information required to make critical decisions, the ability to effectively communicate environmental messages, and the capacity to educate people on the benefits of science-based management.

[3] Long Island Sound Study: http://longislandsoundstudy.net/about-the-sound/what-makes-it-special/

The NERR System is a logical tool to help Connecticut meet these needs. A Connecticut-based NERR will enhance and extend complementary activities of programs like the Long Island Sound Study (LISS, part of the U.S. EPA's National Estuary Program,) the Connecticut Coastal Zone Management Program, and the Connecticut Sea Grant Program, through the addition of funding, resources, and expertise. Additionally, it would enable new directions and initiatives by leveraging existing national system programs.

A NERR site will represent an area where long-term and short-term research projects and programs can be initiated, thereby contributing to a better understanding of the biotic and physical nature of estuarine and coastal habitats and the role they play in the larger ecosystem. The existence and proposed use of a NERR site will be an attractive aspect of research proposals submitted for funding by potential researchers. Further, the Connecticut NERR will become part of the long-term Nation-wide water quality and biotic monitoring program. While benefiting from the effort to distribute similar environmental variables at multiple sites across the nation, a Connecticut NERR will be able to immediately provide back to the System a wealth of water quality and coastal/oceanographic monitoring data sets that have been collected for decades within the Sound.

An established reserve will also allow for the development of interpretive and educational programs that will be attractive to both local and regional school systems. Schools of all levels (K-12, colleges and universities) can be encouraged to use the site's resources for field trips, as living laboratories, or as sites for monitoring and assessment programs that can be coordinated with the site's educational programs, and teachers can receive valuable training in environmental and estuarine science.

As for any use of the site for research, training, or education, the value of the establishment of a NERR site lies in the long-term presence of the site as well as the quality and availability of its resources and facilities.

Background and History of the Connecticut NERR Effort

Connecticut has a long history involving the interest and effort to secure a NERR originating within the offices of Connecticut's Coastal Zone Management Program within the Connecticut Department of Environmental Protection (DEP.) The Connecticut Coastal Zone Management Program evolved since its inception in the early 1980s as several organizational units within DEP, namely Coastal Area Management (CAM), the Office of Long Island Sound Programs (OLISP) and the Land and Water Resources Division (LWRD.)

During 1981-82, CAM provided comments on the draft environmental impact statement (DEIS) for the Hudson River NERR in New York. This was genesis of the first effort to establish a NERR in Connecticut, specifically targeting the region of the Connecticut River from Long Island Sound north to the limit of tidal action in Windsor. In 1991 the state, through the office of Governor Lowell P. Weicker Jr., reached out to NOAA to seek formal support for a Connecticut River NERR. While the initial request was favorably received, NOAA rejected the proposal due to lack of funding for new initiatives and the larger need to focus on areas that were under-represented in the System.

By the early 2000s, OLISP had renewed the effort to pursue an NERR. In late 2004 Connecticut again reached out to NOAA through the office of Governor M. Jodi Rell to express an interest in creating a NERR and designating DEP, through OLISP, as the lead agency. Many organizations spanning state, federal, academic, and non-governmental sectors provided letters of support. Unfortunately, NOAA did not have the funding or capacity at the time to support an effort for Connecticut, as they were currently working on expanding the System in Wisconsin and Texas. However, by mid-2005 NOAA contacted OLISP to note that the Texas effort would be completing shortly and once finished, they anticipated staff could then provide a limited amount guidance and support to a site selection effort for Connecticut, albeit without any funding. OLISP began to assemble a group of stakeholders to form a selection committee and began developing a strategy to select and nominate a NERR site. This continued into early 2007 and resulted in an early draft of a selection process document. Later that year staff turnover and attrition within DEP led to the effort stalling, with only minimal work being done to refine and edit the selection strategy over the next several years.

In 2014, capacity within both the Connecticut Department of Energy and Environmental Protection (DEEP - a new Agency combining the original DEP with the Connecticut Public Utility Rate Authority) and NOAA reached a point where a re-invigorated effort resumed and is actively on-going.

CONNECTICUT SITE SELECTION PROCESS OVERVIEW

The following summary outlines key elements of the process for selecting and nominating a NERR site consistent with Section 315 of the CZMA, the associated CFR regulations, and the guidelines prepared by NOAA. A complete copy of the process document is provided in Appendix 2.

Subsequent sections of this report provide a more robust chronicle of the process implementation.

Project Area

The proposed area for consideration included all land and waters within the Connecticut Coastal Area as defined by Connecticut General Statute (CGS 22a-94(a)) and in the case of the Connecticut River, all land and tidal waters within the Ramsar Project Area.[4]

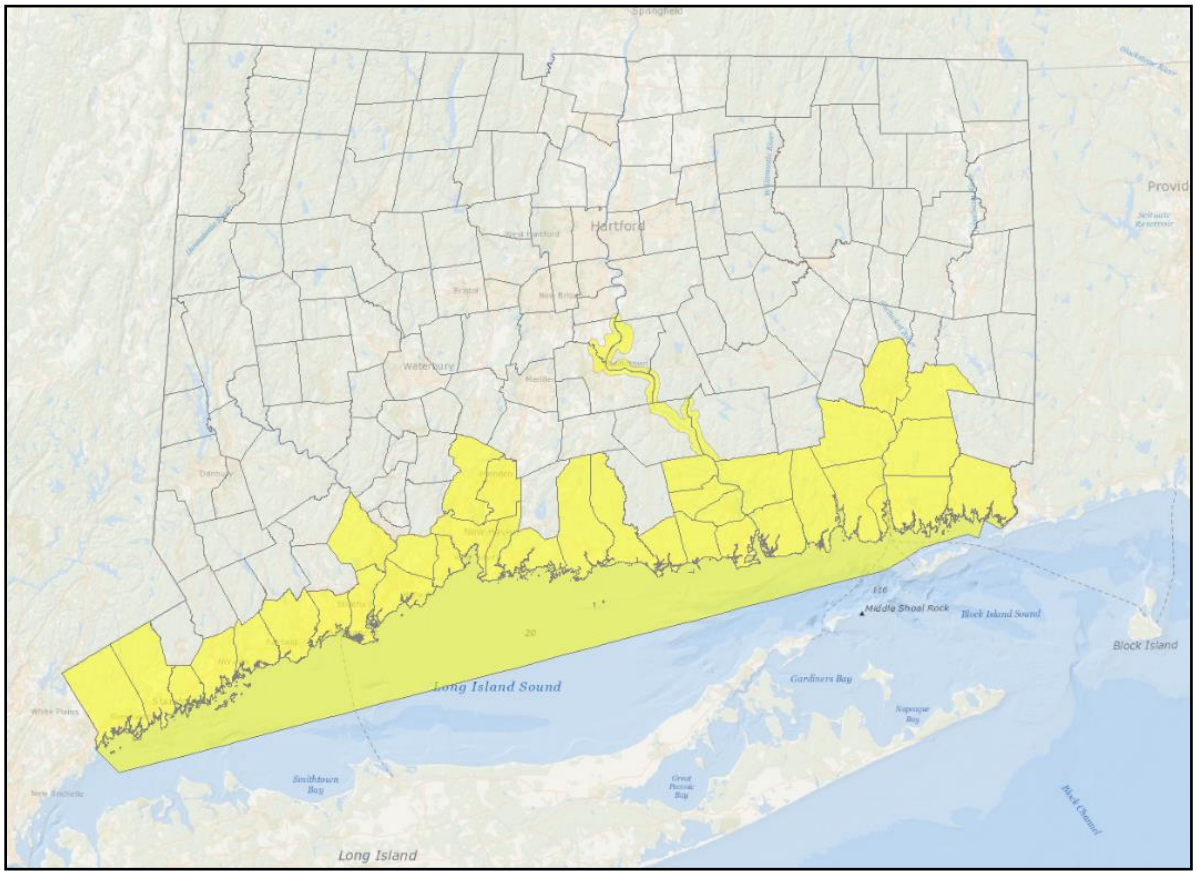


Figure 5: Connecticut NERR project area.

Teams & Functions

DEEP discussed options on team structure and operation with other states that have recently gone through the site selection process and with NOAA. Based on these conversations and

[4] The Ramsar area in Connecticut is part of a worldwide system of tidal wetlands designated as "wetlands of international importance" by the Ramsar Convention, an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975.

experiences with similar projects, Connecticut developed an approach based on several small functional teams. This provided the most efficient way to manage and engage multiple participants across a potentially expansive time-frame. The teams and their roles are described below.

Connecticut NERR Steering Committee: The Steering Committee's role is to ensure that Connecticut selected a NERR that meet or exceeded the System goals and that the process was compliant with NOAA requirements. The Steering Committee was created with representation from the following organizations:

- DEEP-LWRD – As Connecticut's federally approved coastal zone management program, LWRD was designated by the Governor as the state agency tasked to coordinate and lead the effort. LWRD also coordinated with other relevant DEEP programs (e.g., State Parks, Wildlife, etc.) to ensure the team's goals and objectives were met.
- University of Connecticut (UCONN) Marine Sciences Program – Provided recognized expertise in physical, chemical, geologic, and biologic estuarine research and higher education.
- Connecticut Sea Grant – Provided specialized expertise in education and outreach, as well as engaging in research that addresses a range of coastal management issues.

Site Selection Team (SST): The SST was responsible for inventorying, analyzing and evaluating sites for a potential Connecticut NERR. The SST was comprised of two groups - a standing set of resource and subject matter experts from a variety of state agencies, academic institutions, and non-Governmental organizations ("core team"), and an ad-hoc array or external subject-matter experts that could be engaged on an as-needed basis ("external experts.")

Federal NERR Team: NOAA provided dedicated staff to function as a liaison between National NERR leadership and Connecticut. While not participating in any decision-making capacity, these staff provided general counsel/guidance to the Connecticut teams during the process and assistance in communication and education on the NERR program.

Regional NERR Team: Connecticut also consulted representatives from existing NERR's in the Southern New England sub region. These individuals provided key operational knowledge regarding the management of a Reserve and implementation of required programs.

Site Screening

Connecticut applied a two-tier evaluation system. The first tier, or Preliminary Screening, was designed to reduce a suite of potential sites to a manageable number. The second tier, or

Detailed Screening, used a set of robust, well-vetted criteria to evaluate and score the best site for a Connecticut NERR. Within the context of the overall screening process, several points should be noted.

Public Involvement: Public engagement was identified as a critical element both from NOAA as well as from states that have recently gone through the selection process. Efforts to engage the public and stakeholders during the process were led by the Steering Committee.

Multiple Sites: Connecticut acknowledged that according to NOAA, Reserves spanning multiple locations often bring logistical, financial, and management issues that single locations do not. However, a multi-site approach in Connecticut may have critical importance, particularly with respect to providing the necessary typology to the southern New England NERR system by including a diversity of ecological aspects.

Climate Change/Resiliency: NOAA provided no specific provisions for considering this aspect in site selection, yet climate change is one of the strategic areas of focus for the reserve system. Connecticut's screening therefore factored in climate change adaptability/resiliency to assure that a potential Reserve can remain ecologically and physically intact and functional, both now and in the foreseeable future.

Preliminary Screening

NOAA allows states to use measures to reduce the number of candidate sites for consideration. The measures considered by Connecticut, taken from NOAA guidelines, were:

- The site is a representative estuary in the biogeographic region or sub-region (i.e., Southern New England sub-region).
- The proposed boundaries of the site include sufficient land and water area to maintain the integrity of the ecosystem.
- The site consists of publicly owned lands and/or demonstrates sufficient potential for land acquisition and adequate land use control to meet NERR objectives.
- The site is accessible by normal modes of transportation.
- The site is suitable for research, monitoring, and resource protection activities.
- The site is suitable for education, training, and interpretation activities.
- The site is suitable to address key local, state, and regional coastal management issues.

Preliminary Screening Outreach

Outreach activities during this stage consisted of two components. The first was an initial public information meeting prior to the selection process to present an overview of the Goals/Mission of a NERR, why Connecticut is undertaking this, how the process will function, and in general serve as a question and answer forum for the public. Additionally, the SST sought voluntary membership from interested parties to assist in the subsequent screening.

The second was a similarly structured public meeting convened at the end of the Preliminary Screening to present the three to five finalist sites and seek comment and discussion.

Detailed Screening

The finalist sites identified from the preliminary screening were subjected to a more rigorous evaluation based on a suite of detailed criteria (Table 1). This was derived from NOAA recommendations, and modified by LWRD and other stakeholders to call attention to issues relevant to Connecticut. A more detailed presentation of the criteria can be found beginning on page 22 of Process Document in Appendix 2. The SST collected, processed, and analyzed an assortment of data that were synthesized into recommended scores for each criterion. The core membership of the SST then scored the sites individually based on their personal knowledge and views, informed by the recommendations of the group. This allowed the general information to be tempered based on every expert's opinions. A site's score was reflected by the total points from the criteria divided by the total possible points. For each site, scores from each reviewer were averaged. This constituted the final overall score, with the highest over score becoming the proposed site. The SST provided the results of the detailed screening process to the Steering Committee for review and approval.

Table 1: Detailed Connecticut NERR Evaluation Criteria List.

Section	Criteria	*Min Score*	*Max Score*
1	**Environmental Representativeness & Characteristics**		
1.1	Ecosystem Composition	*0*	*3*
1.2	Balanced Ecosystem Composition	*0*	*3*
1.3	Habitat Composition / Complexity	*1*	*3*
1.4	Uniqueness of Habitat	*0*	*3*
1.5	Importance of Habitat for Significant Flora / Fauna	*0*	*3*
1.6	New or Exemplary Typology	*0*	*3*
1.7	Site's Relationship to Tidally Influenced Drainage Basin	*0*	*3*
1.8	Geologic Uniqueness / Diversity of the Site	*0*	*3*

Section	Criteria	*Min Score*	*Max Score*
1.9	Hydrographic Uniqueness / Diversity of the Site	*0*	*3*
1.10	Salinity Gradient	*0*	*3*
1.11	Degree Developed and Potential Impacts to Water Quality	*0*	*3*
2	**Value for Research, Monitoring & Stewardship**		
2.1	Suitability of the Site for Long Term Research	*0*	*3*
2.2	Previous and Current Research Efforts	*0*	*3*
2.3	Suitability of the Site for Environmental Monitoring	*0*	*3*
2.4	Suitability of the Site for Stewardship Program Development	*0*	*3*
2.5	Ability to Address Local, State, and Regional Coastal Management Issues	*0*	*3*
3	**Value for Training, Education, and Interpretation**		
3.1	Value of the Site for Environmental Education, Interpretation, and Training Programs	*0*	*3*
3.2	Diversity and Quality of Education and Interpretation Opportunities	*0*	*3*
3.3	Previous and Current Education / Outreach Efforts	*0*	*3*
3.4	Diversity and Availability of Target Audiences	*0*	*3*
4	**Acquisition & Management**		
4.1	Land Ownership	*1*	*3*
4.2	Publicly Owned Lands and Feasibility of Land Acquisition	*0*	*3*
4.3	Availability of Facilities	*0*	*3*
4.4	Proximity and Accessibility of Site to Researchers, Educators, and Environmental Managers	*0*	*3*
4.5	Controlled Land and Water Access	*0*	*3*
4.6	Site Security	*0*	*3*
4.7	Compatibility with Existing Management Practices and Consumptive / Non-consumptive Uses	*0*	*3*
4.8	Compatibility with Adjacent Land and Water Uses	*0*	*3*
4.9	Future Development Plans	*0*	*3*
5	**Climate Resiliency**		
5.1	Facility Resiliency - Accessibility	*0*	*3*
5.2	Facility Resiliency - Vulnerability	*0*	*3*
5.3	Resource Resiliency	*0*	*3*

Detailed Screening Outreach

Once the SST arrived at a final site to nominate as the Connecticut NERR site, NOAA regulations required a public meeting, publicized in local newspapers and the Federal Register at least 15 days prior, to present the results and solicit feedback. Comments received through public meeting are to be included as part of the site selection submission to NOAA.

Final Evaluation & Nomination

After reviewing and evaluating all final comments, the Steering Committee will draft the final report with the ranking and site recommendation. The Steering Committee will then send the report to Governor of Connecticut for endorsement of the site to NOAA as the nominee for a Connecticut Reserve.

CONNECTICUT SITE SELECTION IMPLEMENTATION

The following sections describe the implementation of the steps outlined in the Selection Process.

Pre-Kick-off Organization

The history of the Connecticut NERR effort included many starts and stops typically due to unaligned state and federal resources. From 2014 to 2016, however, both the Connecticut and NOAA were able to commit the staff required to carry out the site selection and nomination process. Organizational steps included:

- Iterative review of and edits to the site selection process document;
- Regular to semi-regular calls to identify tasks and goals and to monitor progress;
- LWRD engaged senior leadership within DEEP to outline the case for a NERR and seek advisement and organizational support;
- LWRD engaged both senior leadership and staff from UCONN and CT Sea Grant to outline the case for a NERR and seek organizational involvement as Steering Committee members and SST members;
- NOAA staff and the Steering Committee held monthly calls to review and refine key elements of the overall process and to organize and plan the formal project kick-off.

LWRD developed an initial list of potential sites within the project area using source material from DEEP (property & conservation land inventories) plus an inventory of ecological sites from the EPA Long Island Sound Study. The resulting two-dozen plus locations (Figure 6 and Table

2) were designed to help the screening process get underway. These possibilities were considered fluid - areas could be removed from consideration; areas could be added; or areas could be combined. The general rules of thumb used to generate these were:

- A desire to be well-distributed among the entire NERR project area;
- All/most of the site is state-owned property (typically by DEEP)
- In or around the site, meaningful information exists (or there is reason to believe it exists) to enable the review process to begin.

Although these list upland components, it was acknowledged that subtidal components proximal to the property would also be included. The extent and rationale for these would be best determined during the screening processes so no boundaries were developed at this stage.

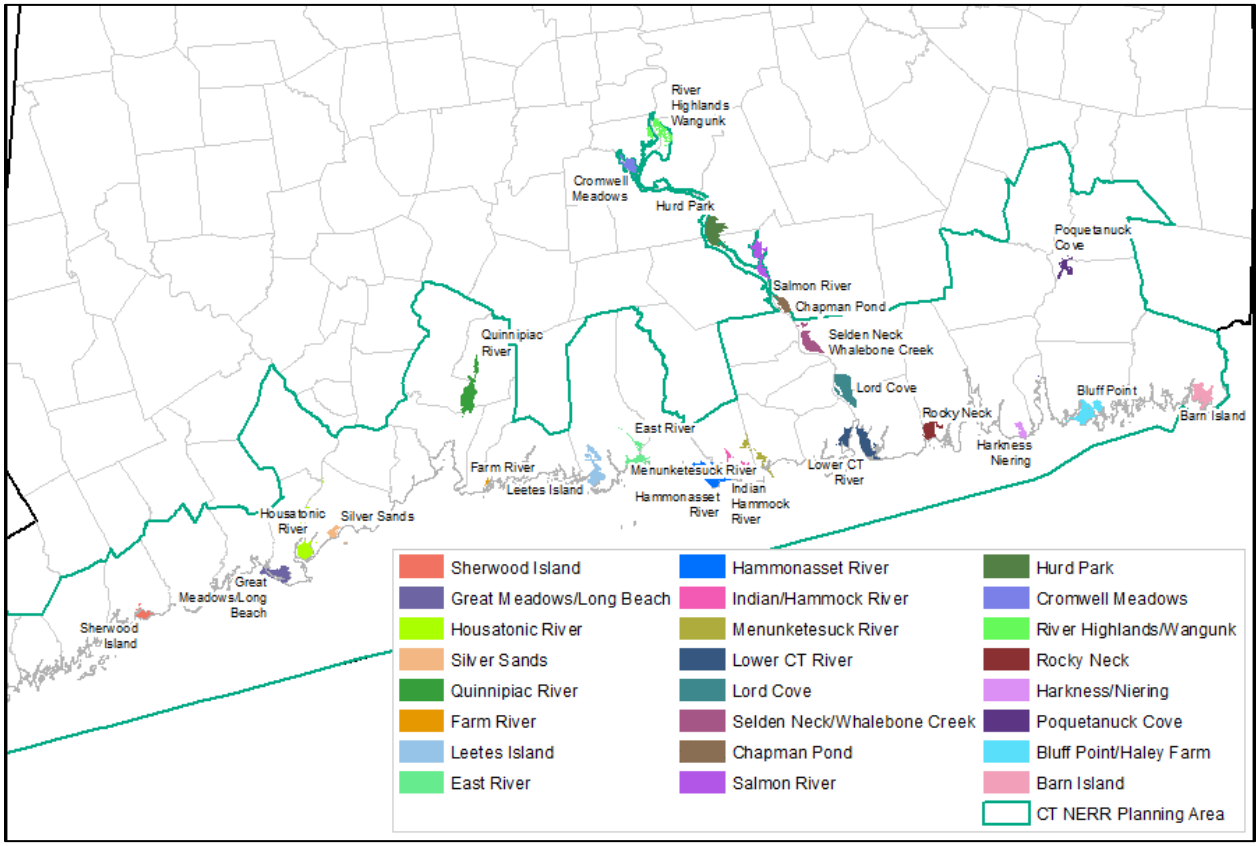


Figure 6: Initial map of potential Connecticut NERR sites.

Table 2: Initial list of potential Connecticut NERR sites.

Property	General Ownership Type
Sherwood Island	State Park
Great Meadows/Long Beach (SB-NWR)	Part of USFWS Wildlife Refuge System

Property	General Ownership Type
Housatonic River (Nells Island, Popes Island, Milford Point: SBM-NWR)	Wildlife Management Areas, Part of USFWS Wildlife Refuge System
Silver Sands / Charles Island Natural Area Preserve	State Park and Natural Area Preserve
Quinnipiac River	State Park, Wildlife Management Area
Farm River	State Park, Wildlife Management Area
Leetes Island	State Park, Wildlife Management Area
East River	State Park, Wildlife Management Area
Hammonasset State Park / Natural Area Preserve	State Park and Natural Area Preserve
Indian/Hammock River	Wildlife Management Areas
Menunketesuck River (SBM-NWR, Sciongay Property) *	Part of USFWS Wildlife Refuge System, DEEP property
Lower Connecticut River (Ragged Rock Creek, Great Island)	Wildlife Management Areas
Lord Cove	Wildlife Management Area
Selden Neck / Whalebone Creek (Hadlyme Cove)	State Park, other
Chapman Pond (Lord Island / Riches Island)	Wildlife Management Areas
Salmon River	State Park, Wildlife Management Area
Hurd Park	State Park
Cromwell Meadows	Wildlife Management Area
River Highlands/Wangunk	State Park, Wildlife Management Area
Rocky Neck	State Park
Harkness/Niering	State Park and Natural Preserve
Poquetanuck Cove	Water Access Site
Bluff Point	State Park, Natural Area Preserve, Coastal Reserve
Haley Farm	State Park
Barn Island	Wildlife Management Area

** map approximates marsh area as proxy for reserve – property boundaries not available. Also displays property incorrectly labeled as DEEP state park (Sciongay property acquisition.*)

Kick-off Meeting

A kick-off meeting was held on April 12, 2016 at DEEP headquarters in Hartford CT, and was streamed live via a webinar to enable remote participation. Invitations were broadly distributed via multiple e-mail contact lists maintained by DEEP, UCONN, and CT Sea Grant, as well as to specific organizations and people familiar with (or potentially interested in) the NERR effort. The meeting goals were to introduce the concept of a Reserve and to provide background on the System as a whole, to provide a rationale for establishing a NERR for Connecticut, and to identify the process to select and nominate a site. Presenters from both NOAA and the Steering Committee included:

- Erica Seiden – NERR System Program Manager, NOAA
- Allison Castellan – Coastal Zone Management Specialist, NOAA
- Dr. Sylvain DeGuise – Director, Connecticut Sea Grant
- Dr. Jim Edson – Head, UCONN Department of Marine Sciences[5]
- Kevin O'Brien – Senior Environmental Analyst and NERR Project Lead, DEEP LWRD

In addition, the Reserve Manager from the Hudson River NERR in New York, Betsy Blair, gave a presentation on the functions, benefits, and challenges faced from the perspective of an established NERR in the Southern New England sub-region to help provide some specific context for NERR operations. Rebecca Roth, Executive Director of the National Estuarine Research Reserve Association (NERRA), the national nonprofit organization advancing the work of the reserve system, was also present to support the effort and help answer questions.

Although attendance was slightly lower than expected (approximately 40 attendees in-person and via webinar) the material was well-received and generated a lively question and answer session at the end. All the materials for the kick-off meeting including agendas, presentations, attendee lists, handouts, and notes can all be accessed via the Connecticut NERR project web site at: http://tinyurl.com/CTNERR-Meeting-Materials

SST Organization

Prior to the kick-off, the Steering Committee identified a set of individuals to pre-invite to the team. Selection included factors such as involvement with or support for the earlier NERR efforts; a level of expertise or involvement in aspects critical to NERR site selection or operation; and a broad distribution of membership – geographically within the coastal area as well as by sector (e.g., academic, state, federal, non-governmental organization, public, etc.) A formal invitation was sent from DEEP Commissioner Robert Klee on April 1, 2016. While nearly all invitees responded, not all were able to commit their time to the process, and the list went through several rounds of iterations. An invitation to the public to join the SST was also made at kick-off, but resulted in no additional members.

An initial SST meeting was held on May 18, 2016. Nineteen individuals participated in person or via conference call. The meeting included a more comprehensive overview of the NERR screening process, and discussions on team logistics/operations. Based on the information

[5] During the selection process, Dr. Edson left UCONN. His role was taken over by Dr. J. Evan Ward, the current Head of the Department of Marine Sciences.

presented, a final slate of SST membership was developed. Tables 3 and 4 identifies names, affiliations, and specialties of the both the core team (i.e., the more involved role throughout the process) and the external expert team (i.e., those in a more limited capacity based on availability.) It presents the final slate of members, as retirements and job transitions affected the initial roster.

Table 3: SST Core Team Members.

Name	Organization	Specialty
Chris Elphick	UCONN - Ecology & Evolutionary Biology	Conservation Biology / ecology / ornithology
Jamie Vaudrey	UCONN - Marine Science	Ecosystem Dynamics / eutrophication / water quality
Michael Whitney	UCONN - Marine Science	Physical dynamics of estuarine / coastal systems
Roman Zajac	University of New Haven - Biology & Environmental Science	Coastal Ecology
Scott Warren	Connecticut College	Wetland Ecology
Chantel Collier	The Nature Conservancy	Director, TNC LIS Program
John Forbis	CT Audubon Society (CAS) Roger Tory Peterson Estuary Center Board	Systems Engineering / Project & Business Management / Civic volunteerism
Ralph Wood	CT Audubon Society Roger Tory Peterson Estuary Center Board	Systems Engineering / Org. Development / CAS Emeritus Chair
Peter Auster	UCONN / Mystic Aquarium / Sea Research Inc.	Fish Ecology / conservation
Dave Kozak	DEEP LWRD - Coastal Planning	Coastal land use planning / conservation
Dana Payne	CT Sea Grant	Education coordinator
Julianna Barrett	CT Sea Grant	Coastal Ecosystems / Ecology / Climate Change-Resiliency
Shannon Kearney	DEEP - Environmental Conservation	Wildlife Management
Robin Blum	DEEP - Environmental Conservation	Wildlife Management
Mark Parker	DEEP - LISS Coordinator	Water Planning & Standards / Long Island Sound Study Liaison
Tom Robben	CT Ornithological Society	Avian Habitats / conservation
Susan Whalen	DEEP - Environmental Conservation	Environmental Management Outdoor Recreation / Natural Resource Programs

Table 4: SST External Experts.

Name	Organization	Specialty / Interest
Jennifer Mattei	Sacred Heart University	Upland, wetland, stream restoration / control of invasive plant species / population ecology
Shimon Anisfeld	Yale University - Water Resources & Environmental Chemistry	water resources, coastal ecology, environmental organic chemistry
James Ammerman	EPA Long Island Sound Study	Water Quality
Patrick Comins	CT Audubon Society	Avian conservation, habitat restoration & protection
Ron Rozsa	Public / DEEP (retired)	plant community ecology, coastal ecology, marine biology, benthic community ecology, natural history, marine and terrestrial taxonomy
Ralph Lewis	DEEP (retired) / UCONN Marine Sciences Emeritus	Marine Geology
Suzanne Paton	US Fish & Wildlife Service - Senior Biologist	Biology / Coastal Habitats

Kevin O'Brien, Senior Environmental Analyst with DEEP served as the overall Site Selection Lead.

All the materials for the initial SST meeting and all subsequent meetings including agendas, presentations, attendee lists, handouts, and notes can all be accessed via the CT NERR project web site at: http://tinyurl.com/CTNERR-Meeting-Materials

Preliminary Screening

Following the initial SST meeting, the group refined aspects of the preliminary screening process, and developed two key data sets.

One provided additional information on potential candidate sites. Using the initial list and map as guide, LWRD staff created an augmented inventory and property summary that included data on property size, the location and types of adjacent protected lands, brief property descriptions, and basic ecological data. (See Appendix 3.)

LWRD staff also created a set of typological inventory summaries. These were designed to help compare NOAA typological classification elements between any potential CT sites and the current reserves in the Southern New England Biogeographic region (Hudson River, New York;

Narragansett Bay, Rhode Island; and Waquoit Bay, Massachusetts.) Existing NERR Site Description documents and Management Plans for these Reserves provided key information.[6]

Organizationally, the SST set up several functional sub-teams:

Site Description Teams: Five teams of three to four people to provide a uniform level of details/analysis of potential sites by addressing the following:

- General Site Description
- Ownership Status
- Site Profile based on NERR Typologies
- Possible boundaries
- Considerations as part of Multi-Site NERR
- Educational opportunities
- Research/monitoring opportunities
- Stewardship/Conservation ability
- Access issues

The teams used the augmented inventory summaries, plus additional research, knowledge and expertise to develop preliminary site descriptions. An example description for Hammonasset State Park and Natural Area Preserve is included as Appendix 4.

Team 1: Sherwood Island, Great Meadows/Long Beach, Housatonic River, Silver Sands

- Jennifer Mattei (SHU)
- Patrick Comins (Audubon CT)
- Chantal Collier (TNC)

Team 2: Quinnipiac River, Farm River, Leetes Island (aka Great Harbor/Lost Lake/West Woods), East River

- Mark Parker (DEEP)
- Dave Kozak (DEEP)
- Chris Elphick (UCONN)

[6] Site descriptions and management plans for all established Reserves can be found at https://coast.noaa.gov/nerrs/

Team 3: Hammonasset, Hammock River., Menunketesuck, Cromwell Meadows, River Highlands

- Juliana Barrett (UCONN/Sea Grant)
- Michael Whitney (UCONN)
- Kevin O'Brien (DEEP)

Team 4: Hurd Park, Salmon River, Chapman Pond, Selden Neck, Lord Cove, Lower Connecticut River

- Ralph Wood (CT Audubon RTP Center)
- John Forbis (CT Audubon RTP Center)
- Mark Johnson / Dave Simpson (original members of the selection process from DEEP Fisheries who retired after the preliminary screening)
- Diana Payne (UCONN/Sea Grant)

Team 5: Rocky Neck, Harkness, Bluff Point, Poquetanuck Cove, Barn Island

- Jamie Vaudrey (UCONN)
- Scott Warren (Conn College)
- Susan Whalen (DEEP)

Shannon Kearney, DEEP Wildlife, provided information on the specific state Wildlife Areas that are included in many of the above configurations.

Typology Team: One team to review typological make-up of southern New England NERRs and provide guidance when determining if/how potential CT sites are unique. The team used existing typological inventory summaries, discussion with several NERR Reserve staff, and reviewing additional reports and material.

- Ron Rozsa (public/DEEP retired)
- Roman Zajac (UNH)
- Peter Auster (UCONN/Mystic Aquarium)
- Kevin O'Brien (DEEP)

Between June and September, 2016, the teams researched and compiled information. In August a check-in call was conducted to gauge progress, share preliminary information and raise any concerns or issues. On October 4, 2016 the SST team convened an internal day-long

meeting to present the results of the site review process and conduct a preliminary screening exercise.

Each team provided a review of the material collected for their assigned sites. For the teams assigned to potential sites in the western area of LIS and the Connecticut River, this included additional property beyond the initial site inventories. Parts of the USFWS SBM-NWR on several of the Norwalk Islands were added in the western LIS area, as well as numerous properties along the main stem and coves of the Connecticut River.

Each team provided overall observations for consideration:

Team 1: Sherwood Island, Great Meadows/Long Beach, Housatonic River, Silver Sands:

- The combination of several sites here can provide linkages to NERR program goals and to advance a concept of an "urban estuary." Assessment also included units of SBM-NWR on several of the Norwalk Islands. Suggested a combination of all into a large mosaic.

Team 2: Quinnipiac River, Farm River, Leetes Island (aka Great Harbor/Lost Lake/West Woods), East River

- Suggested that most of the sites covered here would not compare favorably with sites from other groups. East River might be a possible exception from an ecological perspective, although research and educational histories are comparatively limited.

Team 3: Hammonasset, Hammock River, Menunketesuck, Cromwell Meadows, River Highlands

- Recommended a combination of Hammonasset SP/NAP and Hammock River WMA as good combination site; upper Connecticut River sites did not have much information to assist in evaluation. The SBM – NWR brings substantial federal land holdings – concern with meeting 50% non-federal land, general concept of using federal property seems odd considering the amount of high-quality state lands.

Team 4: Hurd Park, Salmon River, Chapman Pond, Selden Neck, Lord Cove, Lower Connecticut River

- After an exhaustive review/analysis, recommended a blend of several properties in the Connecticut River mouth, plus two optional freshwater components (Machimoodus State Park/Haddam Neck, or the Eightmile River.)

Team 5: Rocky Neck, Harkness, Bluff Point, Poquetanuck Cove, Barn Island

- Noted concerns with potential use conflicts across all sites. Identified Barn Island, Bluff Point, and Rock Neck as sites that might offer the most in terms of combining ecologic/education/research capacity.

The SST next discussed the needs and possibilities for typological uniqueness. Comparative analyses on the upland components suggested evidence that vegetative components of several significant salt-marsh complexes in the areas of the Connecticut and Housatonic Rivers would constitute either unique examples (based on plant communities) or exemplary examples (based on size, community composition, salinity exposure/ranges, and low levels of disturbance / hydrologic modification.) Other examples included sites with substantial acres of robust coastal forests (Bluff Point) or habitats not found or likely to exist in neighboring Reserves (sea-level fens in Barn Island.) Relative to off-shore components, sites with direct access to LIS proper could leverage sub-tidal depth and bottom-type characteristics that are not represented in neighboring reserve which are typically shallow (< 6 meters) and have minimal hard-bottom habitat – i.e., bedrock, boulder fields, rocky-dominated areas, etc.

Lastly, the SST considered how best to choose the three to five sites to advance to the detailed screening. Although the preliminary process outlined a quantitative approach of assessing scores based on several relevant criteria, the SST felt it would be more productive to first talk through ways to remove sites that consensus deemed marginal, then consider ways to strategically consolidate any remaining sites. If this effort resulted in more than the target number of sites, then the scoring approach would be employed. The SST first eliminated sites (e.g., several of the sites in the upper reaches of the Connecticut River, plus Poquetanock Cove, Leetes Island, and Farm River) lacking robust levels of general information. During the presentations, several reviewers noted that based on their experience and the results of their investigations, several sites likely had limited capacity to either satisfactorily advance NERR program goals, or generally greatly paled in comparisons to other sites. The marsh complexes in the East River and the Quinnipiac River were examples removed based on this approach.

The sites remaining were generally localized in western, central and eastern areas of the Connecticut coast, as well as in the Connecticut River, which suggested logical ways to combine them based on combining important habitats within similar geographies. Size and overall expanse were discussed, but the SST focused on how the remaining properties could make the best case for a reserve balancing habitat variability and NERR program capacity.

A remaining point of discussion was the inclusion of USFWS SBM-NWR property, which were spread along the coast with saltmarsh units concentrated in the west and central coastlines. Since it was unclear what a final offshore zone might encompass, the primary concern was ensuring that any federal property contributions would not exceed the 50% limit established in the NERR regulations. This, along with a feeling that quality examples of saltmarsh were reflected in other properties, resulted in the Menunketesuck properties being excluded from consideration.

The resulting suite of site possibilities were:

Western Long Island Sound (WLIS):

- Norwalk Islands USFWS SBM-NWR properties on Sheffield, Chimon, & Goose Islands (1) shown in red;
- Sherwood Island State Park (2) shown in green;
- USFWS SBM-NWR Great Meadows & Milford Point properties (3) shown in red;
- Charles Wheeler Wildlife Management Area and DEEP water access at Stratford Point (4) shown in green.
- An offshore area, to be refined during the Detailed Screening that generally extends east to west from the Housatonic River to Long Neck Point, Darien and south to just shy of the Connecticut/New York state boundary. Rather than concentrate these into areas proximal to the upland components, a case was made that the offshore environment has sufficient ecological and monitoring/research related issues that might best be served as one unit.

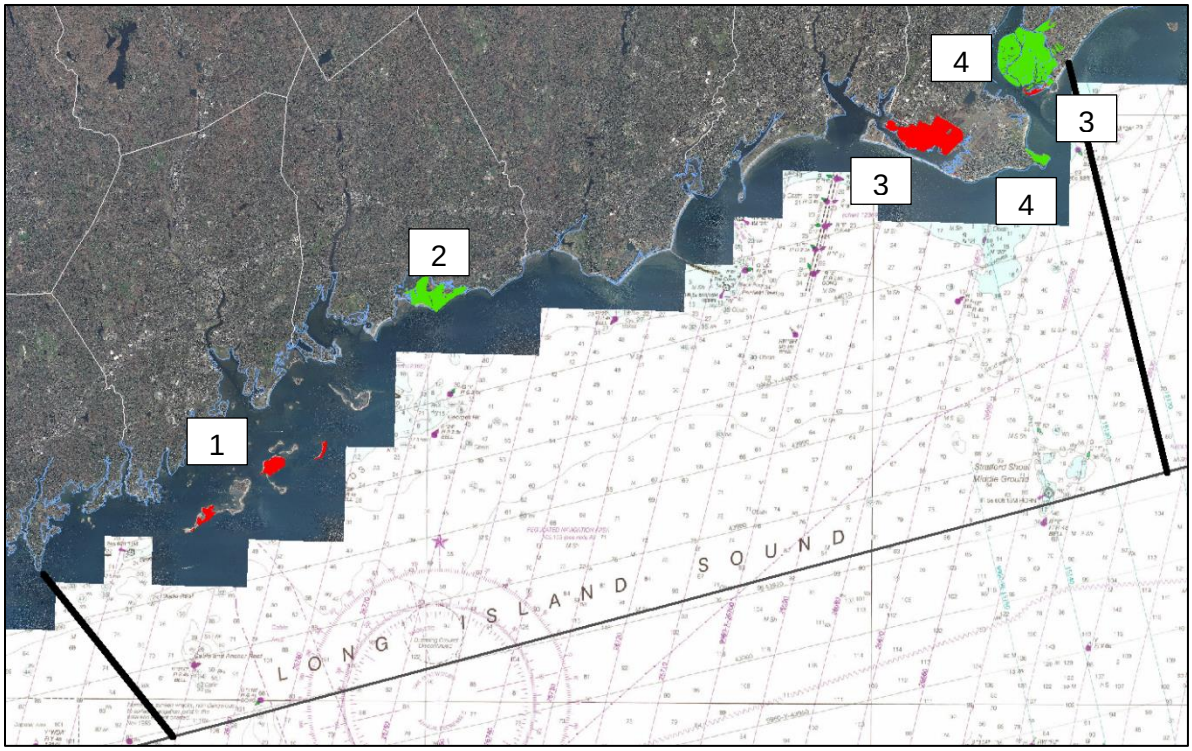


Figure 7: Western LIS Site.

Central Long Island Sound (CLIS):

- Hammonasset State Park and Natural Area Preserve (1)
- Hammock River Wildlife Management Area (2)
- Duck Island Wildlife Area (3)
- An offshore area, to be refined during the Detailed Screening that generally extends east to west from the Menunketesuck River, Westbrook to Meig's Point at Hammonasset State Park and south to just shy of the Connecticut/New York state boundary.

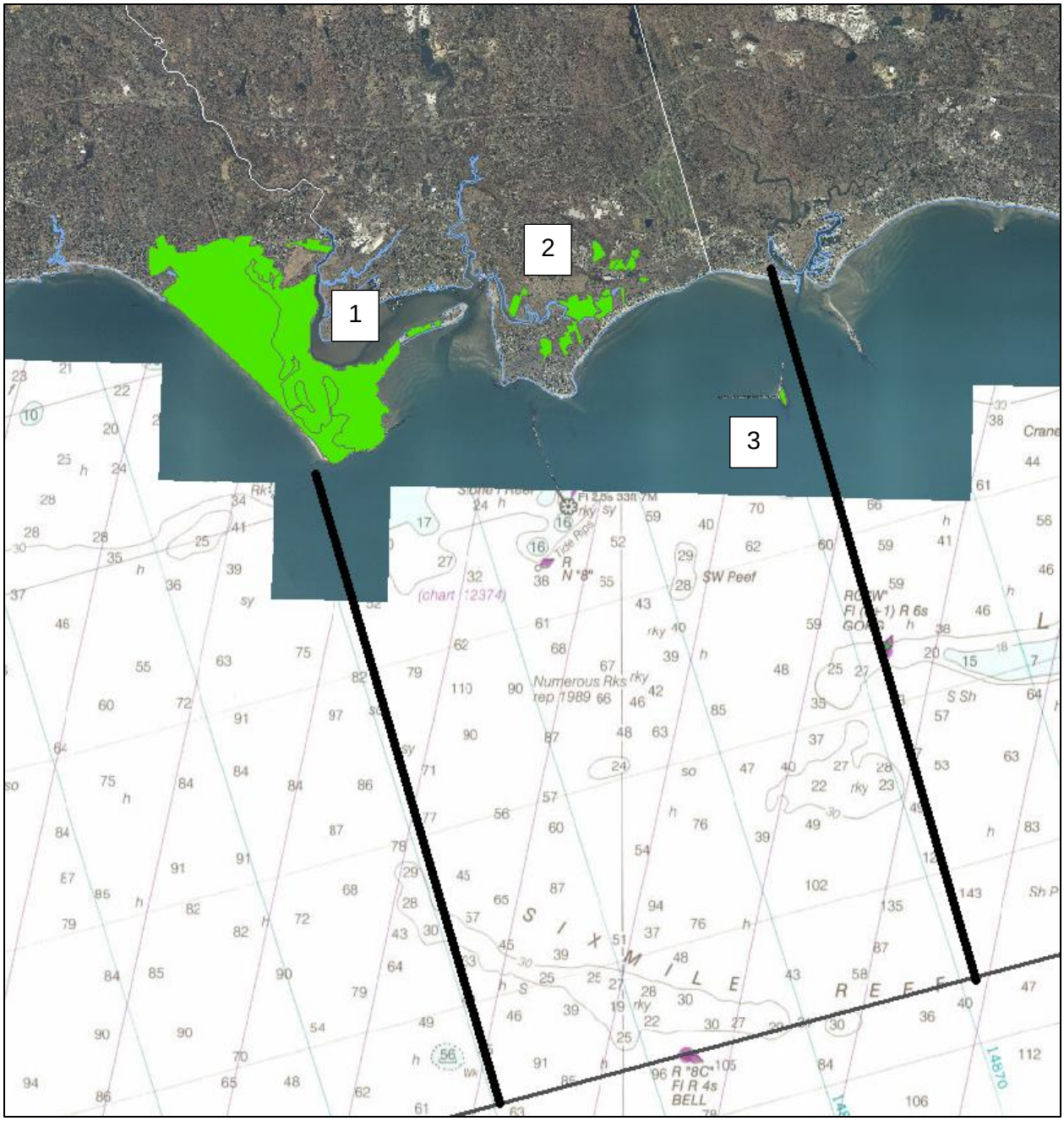


Figure 8: Central LIS Site.

Connecticut River:

- Upper (Freshwater) Component (yielding a greater river range and some added upland habitats not provided by the Eight Mile River option;)
    - Machimoodus State Park; (1)
    - Haddam Neck Wildlife Management Area (2)
- Lower (Brackish) Component:

  - Lord Cove & Nott Island Wildlife Management Areas (3)
  - Ferry Point Wildlife Management Area (4)
  - Great Island Wildlife Management Area (5)
  - Ragged Rock Creek Wildlife Management Area (6)
  - DEEP Marine Headquarters (7)
- An offshore area, to be refined during the Detailed Screening that generally extends east to west from Hatchett Point, Old Lyme to Cornfield Point, Old Saybrook and south to just shy of the Connecticut/New York state boundary. The main stem of the Connecticut River, from just north of Haddam Neck Wildlife Management Area to the mouth is also included, and for the purposes of preserving the riverine system and including a fresh to saline gradient is treated as a single unit.

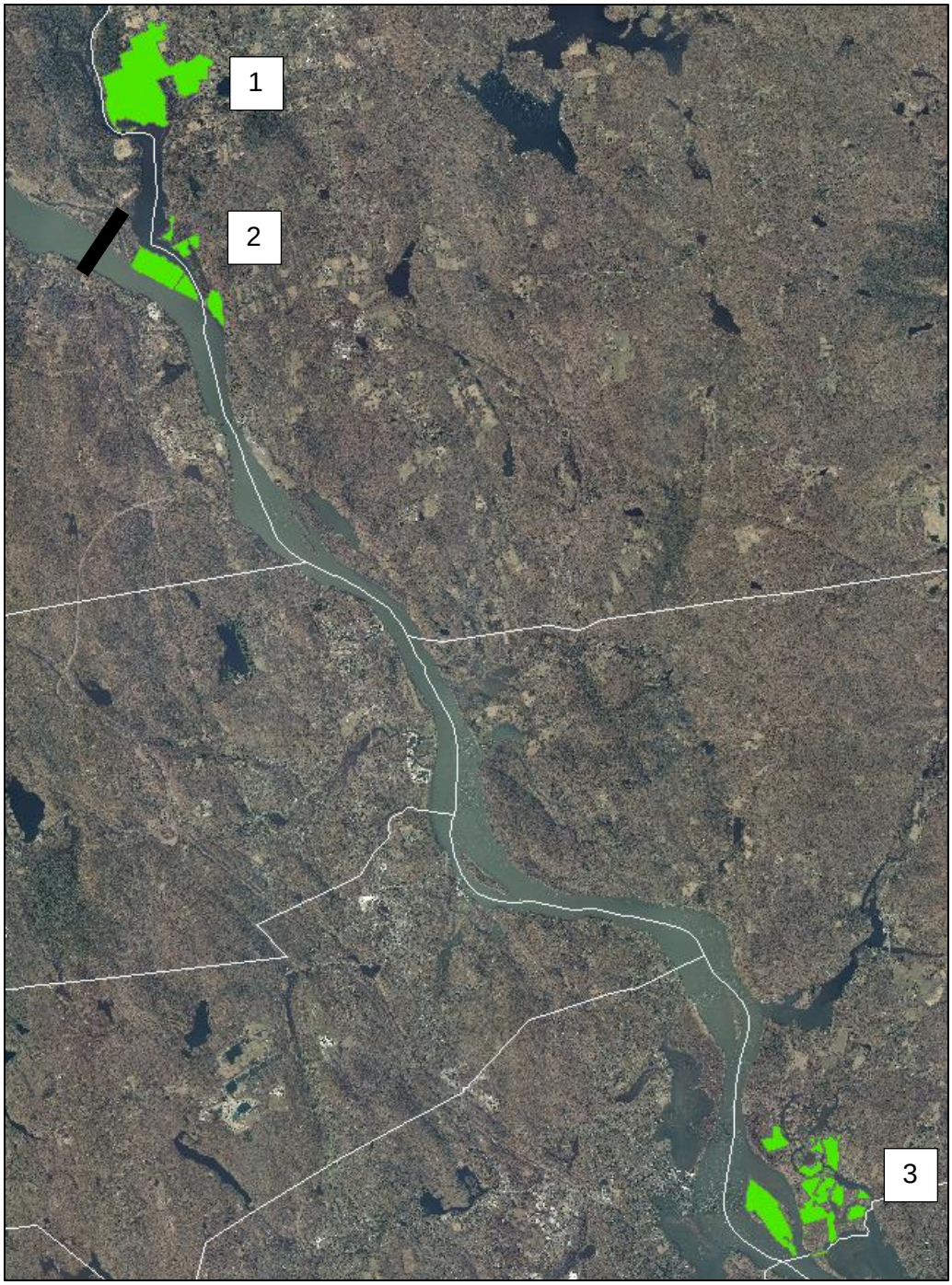


Figure 9: Connecticut River Site - Upper (plus Lord Cove, for context.)

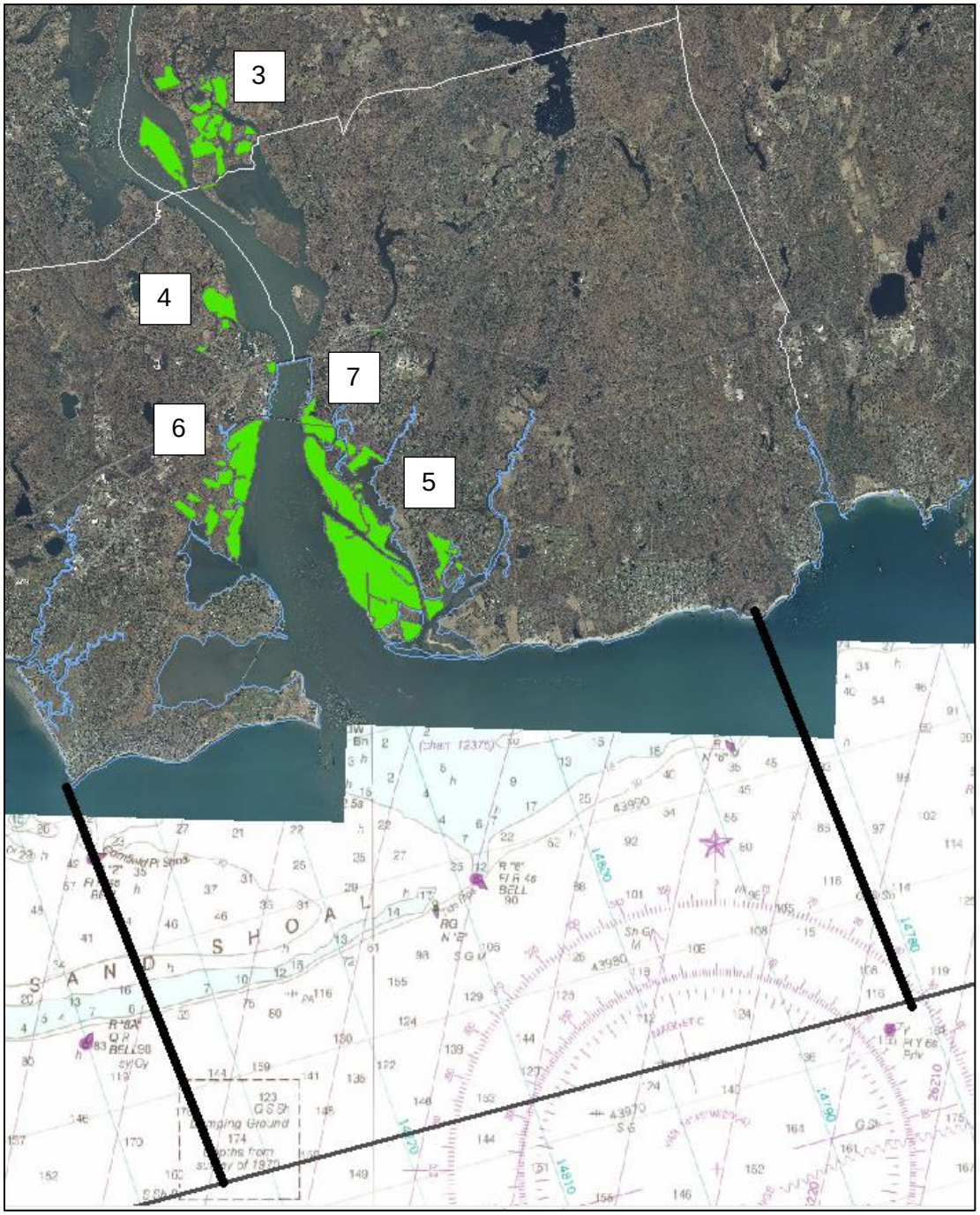


Figure 10: Connecticut River Site – Lower.

Eastern Long Island Sound (ELIS):

- Bluff Point State Park/Natural Area Preserve/Coastal Reserve (1)
- Haley Farm State Park (2)
- Barn Island Wildlife Management Area (3)
- Two offshore areas, to be refined during the Detailed Screening that:

- Extends east to west from Groton Long Point, Groton to White Point, Waterford and south to just shy of the Connecticut New York state boundary. The mouth of the Thames River served as the LIS/riverine boundary (A);
- Includes Wequetequock River and the Connecticut portion of Little Narragansett Bay (B);

Here, the areas are split because the majority of hard-bottom examples are concentrated in the west, with the remaining eastern area of LIS largely dominated by softer bottoms. A smaller subsection concentrated near Barn Island was a suitable way to address this.

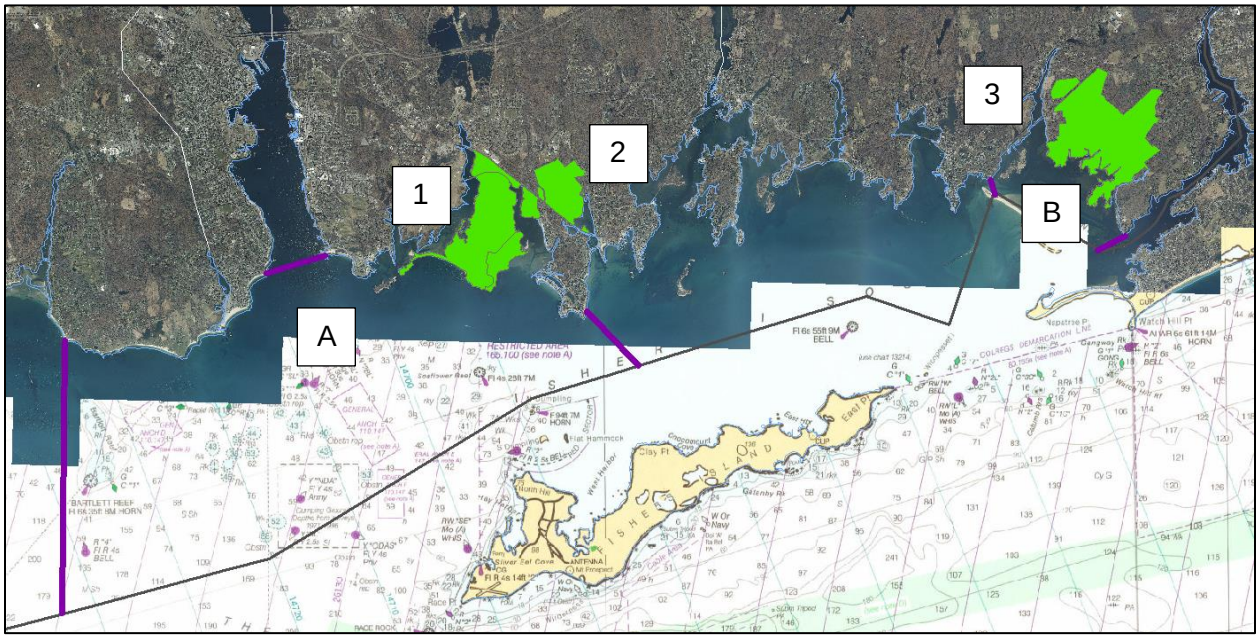


Figure 11: Eastern LIS Site.

These four assemblages represent exceptional examples of:

- Exemplary habitat quality and diversity (e.g., saltmarshes, shrublands, coastal forests; beaches/dunes, islands)
- Sufficient examples of established research and educational opportunities and/or pathways to emergent opportunities;
- Easy points of access through normal mode of transportation;
- Existing or potential capacity to incorporate infrastructure (office, lab, or classroom space) to initially support NERR activities, either on site or nearby.

For sites that were not included as part of these four complexes, the basic rationale was although they have or are believed to have some NERR-related value, they represented add-

ons that generally only extended the extent, size, or existing composition/capacity of other potential sites, but not adding something new or needed. So, for example while Silver Sands State Park and Rocky Neck State Park were not necessarily poor candidates, in the view of the SST they really did not substantially increase the overall value to the western and eastern complexes, respectively.

The SST noted that this process yielded a set of sites that fell within the suggested range to advance to the detailed screening while being consistent with the preliminary criteria and the need to address the capacity of typological uniqueness.

Detailed Screening

From October 2016 to early 2017, the SST transitioned to the Detailed Screening Phase and concentrated efforts on developing strategies to implement the detailed screening criteria and preparing a public meeting to present the results of the Preliminary Screening.

During this phase, the SST re-organized into teams designed to assess and apply the five criteria sets. In this way topical expertise was leveraged to efficiently and consistently assess all four site options and develop scoring recommendations for the entire SST. These recommendations were envisioned to provide a thorough, consistent look at each aspect of the review that would in turn provide a solid foundation for each SST member of the core team to complete their overall scoring. Teams were formed based on background/knowledge as well as stated preference. Individuals with an (*) represent team leads.

Category 1: Environmental Representativeness & Characteristics

- Kevin O'Brien (DEEP)*
- Chantal Collier (TNC)
- Juliana Barrett (UCONN/Sea Grant)
- Jamie Vaudrey (UCONN)
- Chris Elphick (UCONN)
- Shannon Kearny (DEEP)
- Ron Rozsa (public/DEEP retired)
- Scott Warren (Conn College retired)
- Patrick Comins (Audubon CT)
- Tom Robben (CT Ornithological Society)

Category 2: Value for Research Monitoring & Stewardship

- Kevin O'Brien (DEEP)*
- Roman Zajac (UNH)
- Mark Parker (DEEP)
- Peter Auster (UCONN/Mystic Aquarium)
- Michael Whitney (UCONN)

Category 3: Value for Training, Education, and Interpretation

- **K**evin O'Brien (DEEP)
- Diana Payne (UCONN/Sea Grant)*
- John Forbis (CT Audubon RTP)
- Ralph Wood (CT Audubon RTP)

Category 4: Acquisition & Management

- Kevin O'Brien (DEEP)
- Dave Kozak (DEEP)*
- Shannon Kearney (DEEP)
- Susan Whelan (DEEP)
- Robin Blum (DEEP)

Category 5: Climate Resiliency

- Kevin O'Brien (DEEP)
- Juliana Barrett (UCONN/Sea Grant)*
- Dave Kozak (DEEP)

Additionally, a team to help refine the site boundaries was created:

- Kevin O'Brien (DEEP)
- Peter Auster (UCONN/Mystic Aquarium)
- Roman Zajac (UNH**)**

Preliminary Screening Outreach Results

In May 2017, the Steering Committee and SST organized an evening public meeting hosted at the UCONN Marine Science Campus at Avery Point. The intent was to share the results of the preliminary screening, outline the steps of the detailed selection phase, and provide a forum for attendees to ask questions or engage in a dialogue. Invitations were distributed to reach out to a broad and diverse audience included:

- An email invitation to over 200 individuals, organizations, and municipal officials whose roles or interests may overlap with the Reserve program;
- An email invitation to Connecticut state legislators representing the NERR Project area towns;
- Email invitations to the Connecticut offices of U.S. Senators Richard Blumenthal and Chris Murphy;
- Postings to electronic listservs:
    - CT Town Planners and Planning;
    - Long Island Sound Study Citizens Advisory Council;
    - Long Island Sound Study Scientific Advisory Committee;
    - DEEP "Sound Outlook" newsletter email distribution list;

Turnout was lower than anticipated with roughly two dozen audience members. Nonetheless, the presentation was well received and the discussion session generated a robust series of questions and answers involving allowed uses and restrictions, funding commitments/levels, and properties or locations composing sites. Meeting materials, including the summary questions and answers are included in Appendix 5.

Detailed Screening Criteria Team Activities:

Site Boundaries: No substantial resource-based upland properties were added or removed, but potential facility components were addressed. While not a formal requirement of a reserve site, several locations with the means to potentially provide a level of infrastructure support for a reserve (e.g., office space, educational or meeting rooms, equipment storage, etc.) were identified through the preliminary screening process. These along with their connection to potential sites are listed in Table 5.

Table 5: Facility Matrix.

Facility Location	Linkage to Site
DEEP Marine Headquarters	Strong geographic connection to Connecticut River
Meig's Point Nature Center at Hammonasset State Park	Strong geographic connection to CLIS
CT Audubon Coastal Center at Milford Point	Strong geographic connection to WLIS
Sherwood Island State Park Nature Center	Strong geographic connection to WLIS
USFWS facility on Chimon Island	Strong geographic connection to WLIS
UCONN Avery Point Campus	multiple

The UCONN Marine Science Campus at Avery Point was considered a unique case – while closest geographically to ELIS, it is potentially desirable to expand to all other sites due the level of capacity it holds to support multiple NERR-related functions such as research, education, science, and administrative. It is worth noting that given the size of the site complexes, other sources of possible facilities exist (e.g., aquaria, universities, etc.) and can be considered during subsequent phases.

The offshore areas were delineated to reflect NERR typological needs and significant ecosystem composition. Data on surficial sediment distribution, the location of hard-bottom types and submerged aquatic vegetation beds (SAV) or eelgrass, along with topical expertise, resulted in the following areas. Where practical, boundaries followed resources (mainly presence/type of sediment zones or SAV/eelgrass) and were defined by reasonable offsets from state boundaries of New York and Rhode Island to be wholly contained within Connecticut.

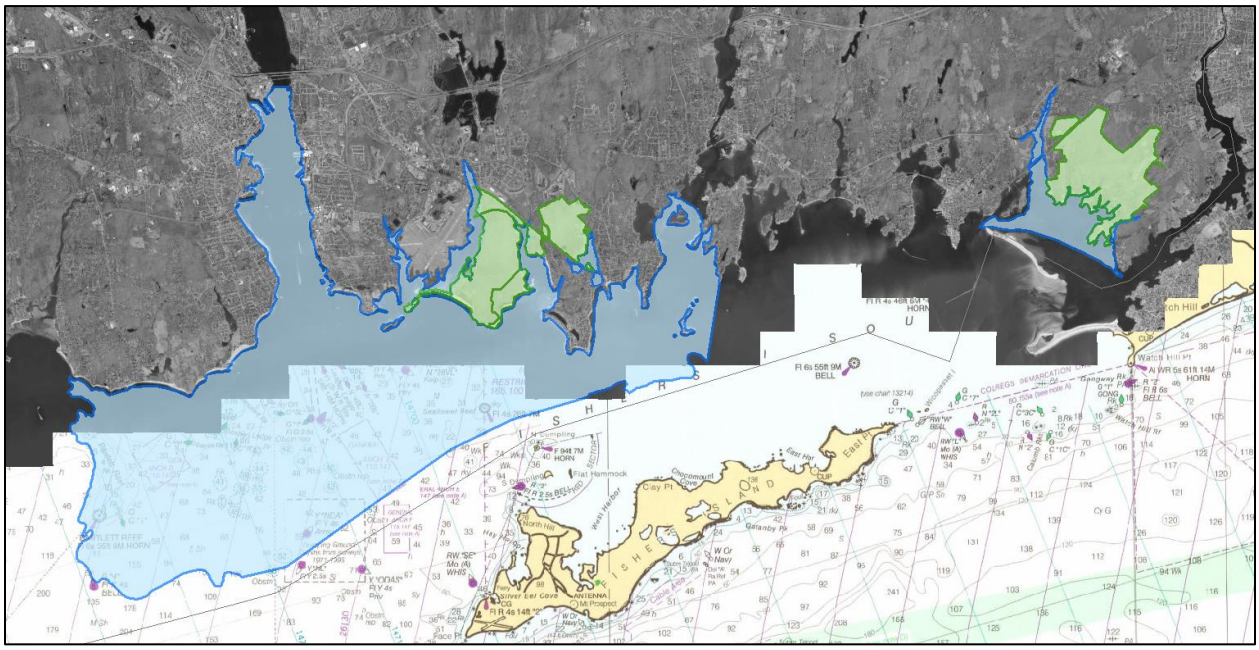


Figure 12: ELIS proposed boundaries. Upland sites are in green. Offshore / subtidal areas are in blue.

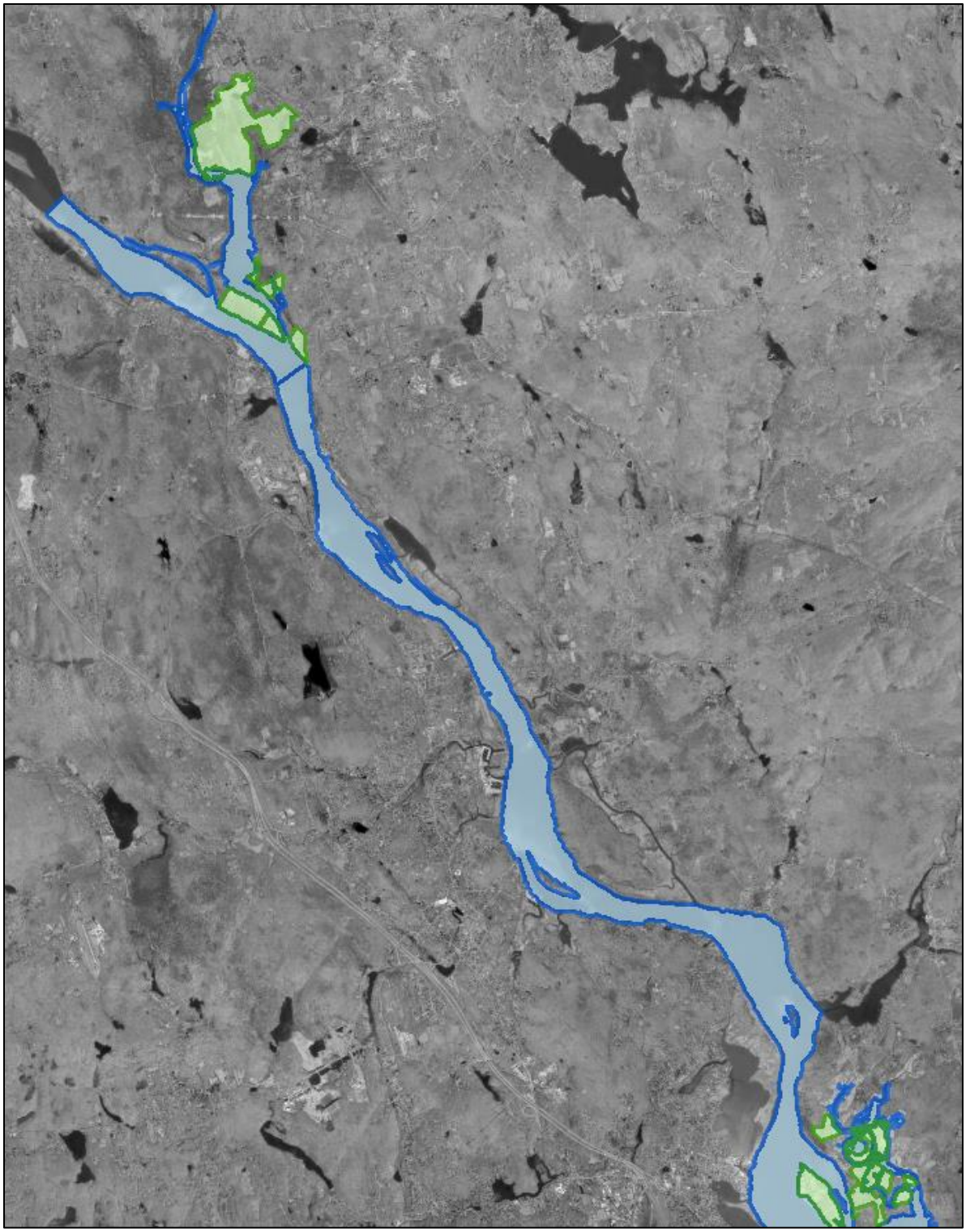


Figure 13: Upper Connecticut River Proposed Boundaries. Upland sites are in green. Offshore / subtidal areas are in blue.

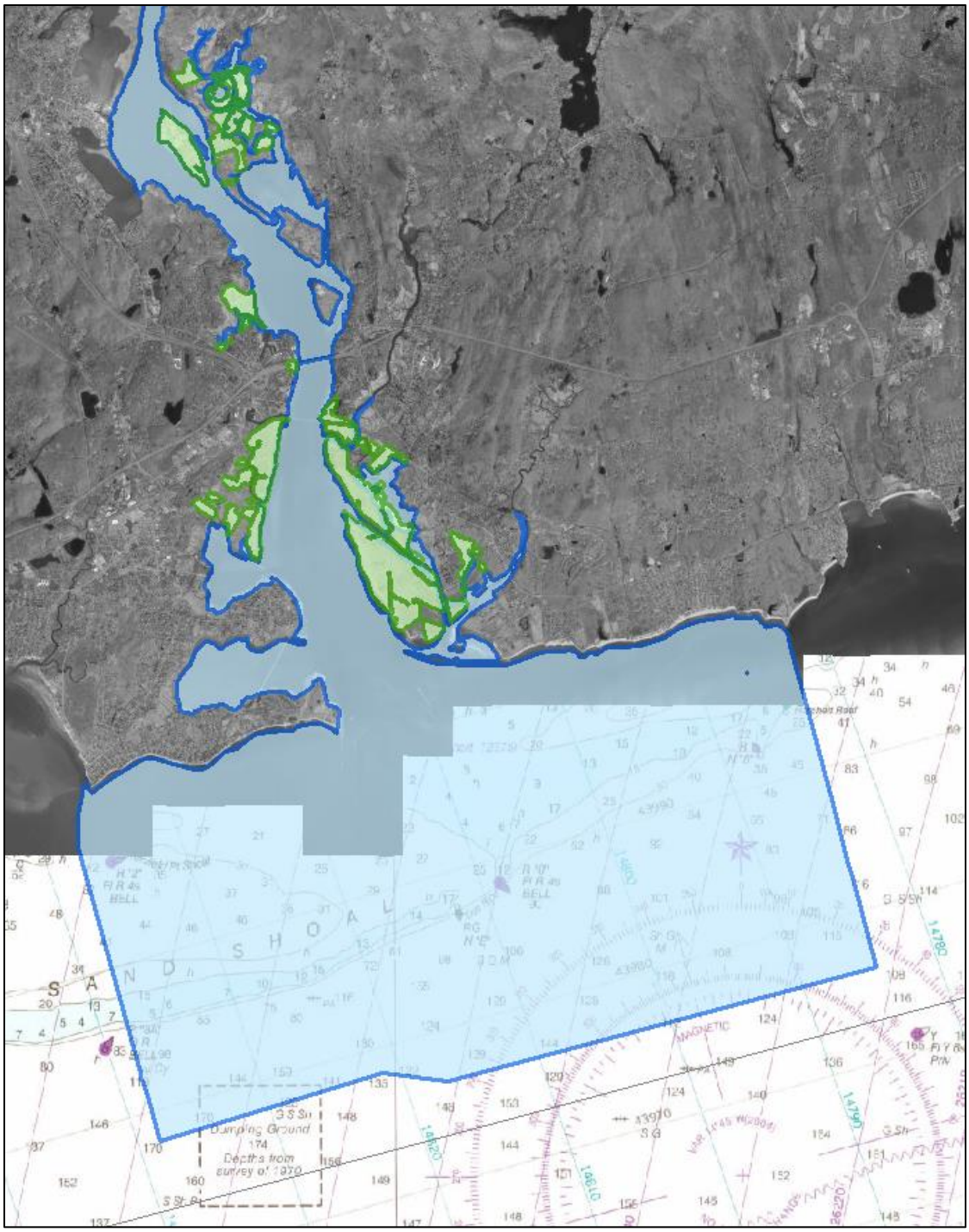


Figure 14: Lower Connecticut River Proposed Boundaries. Upland sites are in green. Offshore / subtidal areas are in blue.

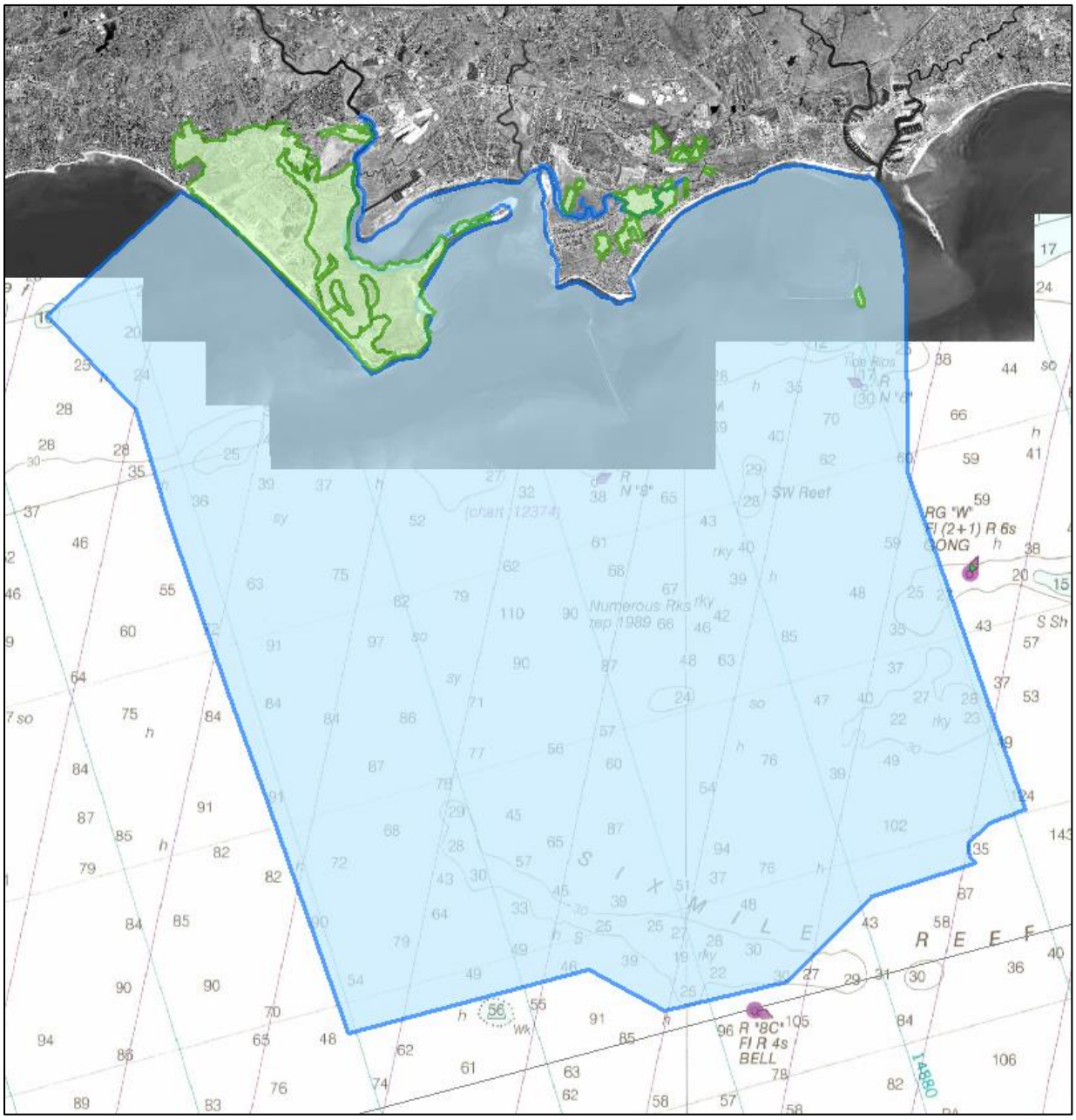


Figure 15: CLIS Proposed Boundaries. Upland sites are in green. Offshore / subtidal areas are in blue.

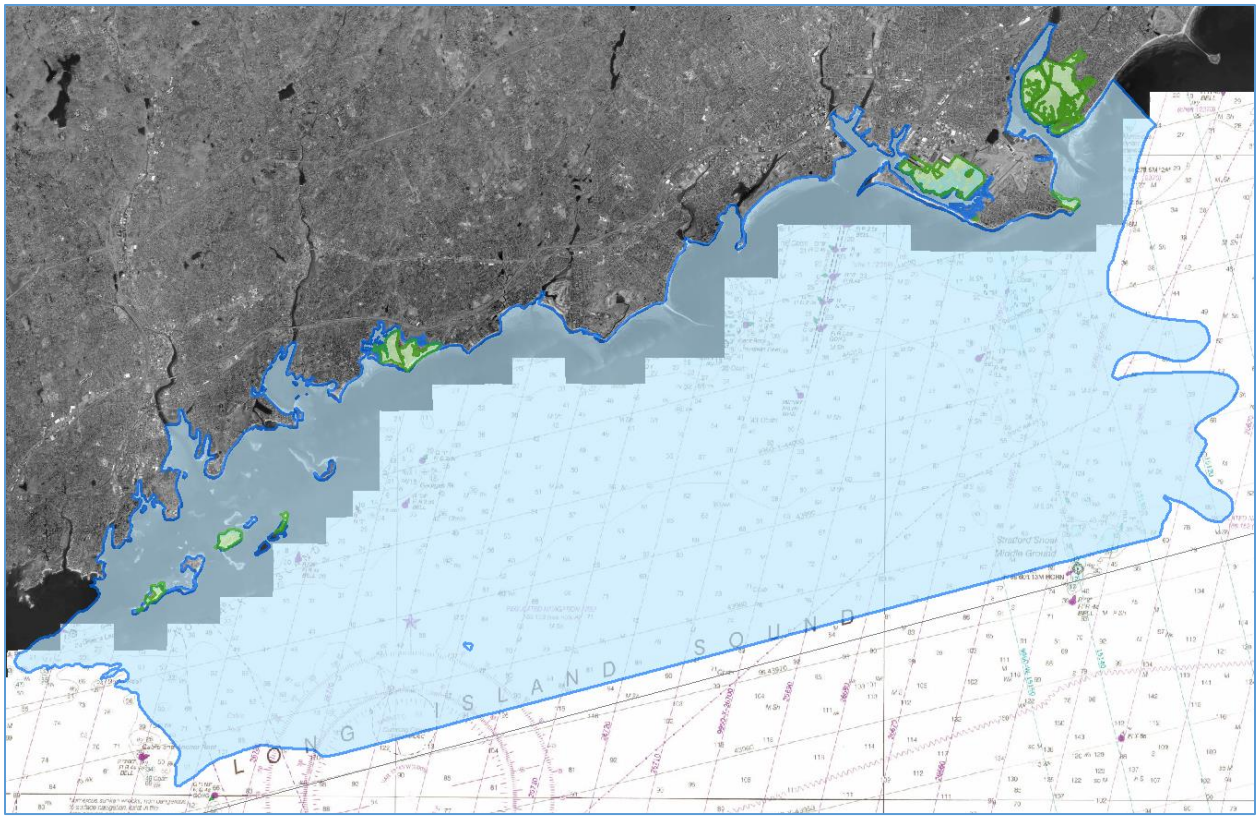


Figure 16: WLIS Proposed Boundaries. Upland sites are in green. Offshore / subtidal areas are in blue.

Criteria Teams: Each of the five teams spent the early summer months of 2017 developing and refining their approaches to arrive at recommendations. Although the differing sets of criteria necessitated differences in the evaluations, two common steps were employed.
Data Identification and Assessment: Each team identified potential sources of information available to apply to the criteria and assessed their viability. Depending on the groups and criteria to be addressed these included, but were not limited to: geospatial mapping data; published and non-published reports such as dissertations, white papers, journal articles, books, etc.; interviews with outside subject matter experts; and inventories of relevant data from web-based searches or data portals.

Interpretations and Measures of the Criteria: Some criteria had objective thresholds that relied on counting or inventorying certain characteristics which directly led scores to fall into pre-defined bins; e.g., X number of these factors leads to a score of Y, and so on. Others required more subjective levels of interpretation relating to concepts such as “good,” “exceptional,” “many” or “few.” Here teams had to break down these elements, based on an understanding of the criteria intent, into subcategories from which collected data could serve as proxies. So, a criterion using an “excellent” rank might be informed by combinations of more quantifiable

measures – number of visits, number of access points, types of resources, etc. – or absent that, a best professional judgement based on the expertise and knowledge of the teams.

On August 17, 2017, the SST team convened an internal one-day workshop. Each criteria team presented their approach and findings for comment and input from the rest of the SST as well as representatives from the Steering Committee and NOAA. While there was general concurrence on the level of overall completeness of and confidence in the analyses, a few areas of improvement were recommended to help clarify the outcomes of the Education and Management teams. It was noticed that one of the education criteria may have double counted some information, and there was some confusion in how the management team synthesized some of the material they collected into the formal scoring recommendations.

Once the Education and Management teams revised their results, voting members of the SST received the final recommendation reports and instructions for evaluating the criteria in mid-September. By early October, the initial results were tabulated along with any supplementary comments and shared among the voting members. Per the process, team members had the opportunity to review the materials and discuss results to determine if any information might cause them to change their scores. On October 30, 2017 a call was convened to facilitate the discussion, and scoring was finalized on October 31. There were no substantive changes overall, although four reviewers did modify at least one of their criterion scores.

Scoring Results:

Each respondent's final scoring sheets (minus any comments or other identifying characteristics) were assigned a generic reviewer number and loaded into an spreadsheet. Comments included with scores were collected, anonymized, and put into an accompanying document organized by criterion. The document contains all initial comments, comments/questions/observations provided during the scoring review phases, and any included with revised scores.

Reviewer's scores were aggregated by site and the average score for each criterion was calculated. These averages were totaled to arrive at a raw score, which was then divided by the total possible points to arrive at a final percentage score.

Table 6: Final site scoring results.

Reviewer	ELIS	CT River	CLIS	WLIS
Rev1	86.46%	84.38%	72.92%	75.00%
Rev2	80.21%	87.50%	66.67%	69.79%

Reviewer	ELIS	CT River	CLIS	WLIS
Rev3	85.42%	79.17%	73.96%	71.88%
Rev4	81.25%	83.33%	72.92%	70.83%
Rev5	84.38%	78.13%	70.83%	71.88%
Rev6	82.29%	81.25%	72.92%	71.88%
Rev7	82.29%	84.38%	72.92%	71.88%
Rev8	83.33%	80.21%	73.96%	71.88%
Rev9	82.29%	81.25%	75.00%	67.71%
Rev10	80.21%	82.29%	72.92%	68.75%
Rev11	82.29%	81.25%	72.92%	71.88%
Rev12	83.33%	68.75%	71.88%	78.13%
Rev13	81.25%	87.50%	73.96%	68.75%
Rev14	82.29%	80.21%	73.96%	71.88%
Ave:	***82.66%***	***81.40%***	***72.69%***	***71.58%***

With a very close margin but a score of 82.66, the ELIS site received the highest overall score. The Connecticut River was a very close second, scoring 81.4. The CLIS and WLIS sites were both at a comparatively lower tier, with scores of 72.69 and 71.58 respectively.

Evaluation of the Fifth (Hybrid) site:

The Steering Committee reviewed the final results which were ultimately forwarded to DEEP for final review and approval to proceed, since DEEP is the landowner. During the time between the beginning and end of site scoring process, an external, politically driven issue regarding use-based conflicts surrounding hunting on several DEEP properties arose. Although the properties in question were not included in the NERR effort, there were substantial concerns regarding user conflicts within the DEEP Wildlife Division about supporting the inclusion of Barn Island Wildlife Management Area property, given its long history of and support for hunting. Since hunting and associated use-related concerns were considered in the spectrum of management criteria during selection process and deemed to be manageable, several months during late 2017 and early 2018 were spent analyzing options for addressing this. Input from other near-by states with Reserves that support hunting (specifically the Hudson River Reserve in New York and the Jacques Cousteau Reserve in New Jersey) factored heavily in an attempt to explain not only how use-based conflicts could be mitigated but how the inclusion of Barn Island within a NERR could help support all forms of use, including hunting. Four possible options - along with associated pros/cons, estimates of effort, and impacts to expected timelines

- were proposed to the DEEP Commissioner, Deputy Commissioners, and Executive Committee members for a decision on how to proceed.

Option 1: Use the results of the scoring process and keep ELIS as is;

Option 2: Eliminate ELIS and use the second highest scoring site of Connecticut River (upper and lower sites.) The CLIS and WLIS sites, being scored at a significantly lower tier, were taken off the table from further consideration.

Option 3: Investigate a new 5th site = a "hybrid" of the lower Connecticut River plus Bluff Point/Haley Farm (no Barn Island, no upper Connecticut River)

Option 4: Investigate a new 5th site = merge all parts of the Connecticut River and ELIS sites in their entirety (including Barn Island)

The options were examined during several rounds of discussions (both internally among DEEP staff as well as with the Steering Committee and NOAA.) It became evident, though that it was politically unfeasible to include Barn Island going forward, which effectively eliminated Option 1 and Option 4. Additionally, a merger of a substantially large number of sites via Option 4 was concerning to NOAA based the level of complexities managing such configurations in other reserves. Option 2 was the most expedient, but would eliminate some of strengths of the Bluff Point and Haley Farm properties from the ELIS configuration – namely a wider variety of exceptional upland habitats and a greater resource resiliency to potential climate change impacts. Ultimately, DEEP felt that Option 3, despite the potential impacts of an extended schedule, was worth investigating to see if it would generate a higher score than the ELIS site. If not, the DEEP Commissioner would make a final determination.

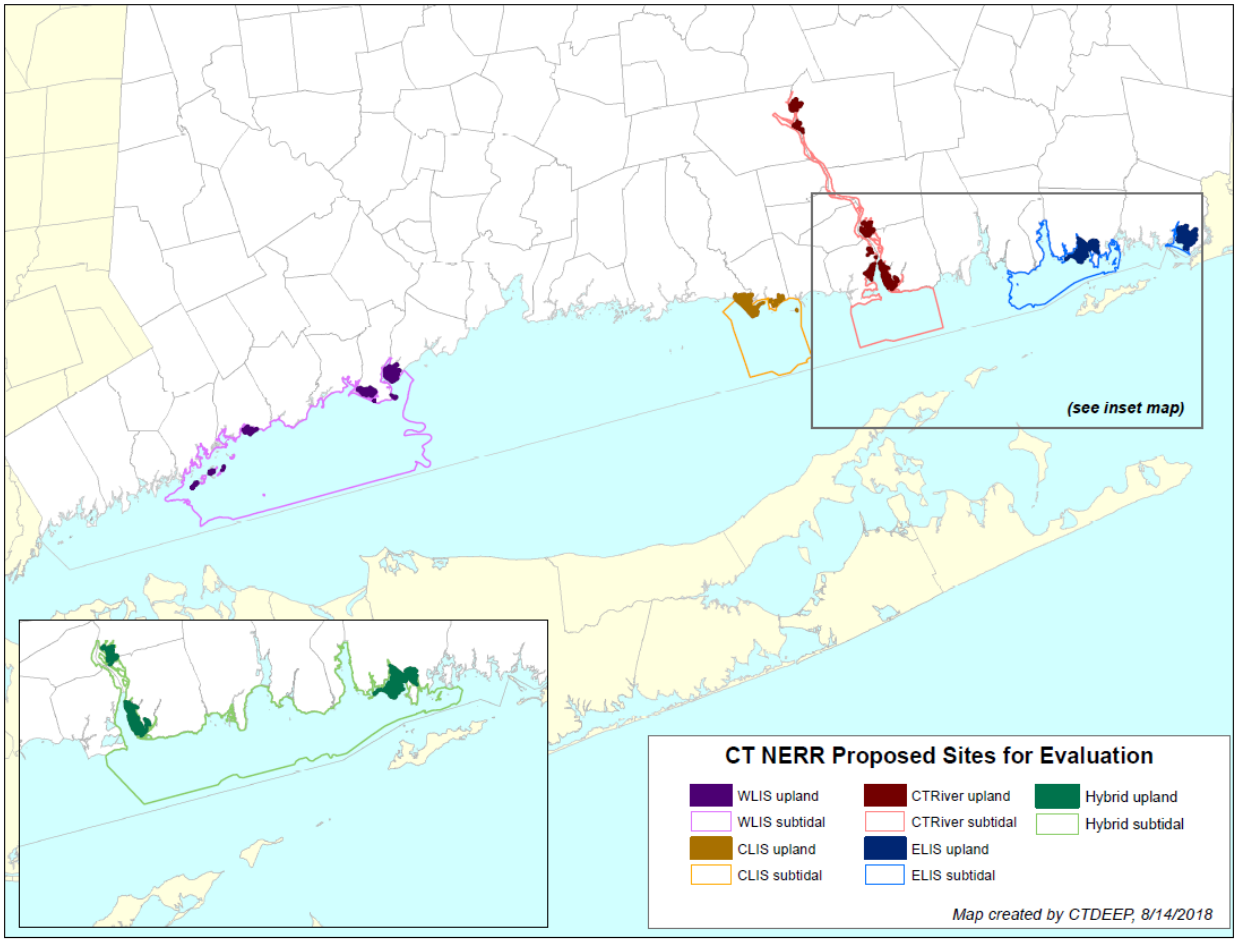


Figure 17: The five potential CT NERR sites evaluated with upland and offshore areas.

During the Summer of 2018, the SST re-visited the evaluation process for the Hybrid configuration of the Great Island and Lord Cove Wildlife Management Areas from the lower Connecticut River site and Bluff Point and Haley Farm from the Eastern LIS site. This process only evaluated the hybrid site – scores from the previous sites were not re-visited. In doing so the team used the same approaches (described previously) and the same data from the initial round to make the scoring as equivalent as possible. Despite these efforts, the two scoring rounds did differ slightly. Due to scheduling conflicts, three individuals who provided scores initially were unable to do so for the hybrid. However, one individual who was unable to participate in the first round was able to in the second. Additionally, due to the compacted timeline, the hybrid scoring did not include a review and rescore option – only one round of final scores were compiled. In short, although the configuration of scorers and steps differed, the discrepancies were deemed slight enough by the Steering Committee to provide confidence that the hybrid score would be comparable to the initial scores.

Summary Scoring Analysis:

The tables and charts below provide a breakdown of how the scoring contributed to the overall site scores, as well as how sites compared when looking at criteria groups.

Table 7 presents the results of the hybrid scoring, included along with the original four sites.

Table 7: Final site scoring results including hybrid site.

Reviewer	**ELIS**	**CT River**	**CLIS**	**WLIS**	**Hybrid**
Rev1	86.46%	84.38%	72.92%	75.00%	93.75%
Rev2	80.21%	87.50%	66.67%	69.79%	86.46%
Rev3	85.42%	79.17%	73.96%	71.88%	83.33%
Rev4	81.25%	83.33%	72.92%	70.83%	85.42%
Rev5	84.38%	78.13%	70.83%	71.88%	86.46%
Rev6	82.29%	81.25%	72.92%	71.88%	85.42%
Rev7	82.29%	84.38%	72.92%	71.88%	86.46%
Rev8	83.33%	80.21%	73.96%	71.88%	n/a
Rev9	82.29%	81.25%	75.00%	67.71%	n/a
Rev10	80.21%	82.29%	72.92%	68.75%	85.42%
Rev11	82.29%	81.25%	72.92%	71.88%	86.46%
Rev12	83.33%	68.75%	71.88%	78.13%	n/a
Rev13	81.25%	87.50%	73.96%	68.75%	85.42%
Rev14	82.29%	80.21%	73.96%	71.88%	83.33%
Rev15	n/a	n/a	n/a	n/a	85.42%
Ave	***82.66%***	***81.40%***	***72.69%***	***71.58%***	***86.11%***

With a score of **86.11**, the Hybrid site received the highest overall score, besting the next closest scorers (ELIS at 82.66 and Connecticut River at 81.40) by 3.45 and 4.71 points, respectively. The differential between the hybrid and ELIS (3.45) more than doubles the previous differential of 1.26 between ELIS and Connecticut River from the initial scoring. CLIS and WLIS sites were both at a comparatively lower tier, with final scores of 72.69 and 71.58 respectively.

Therefore, the Hybrid site became the CT NERR nominee.

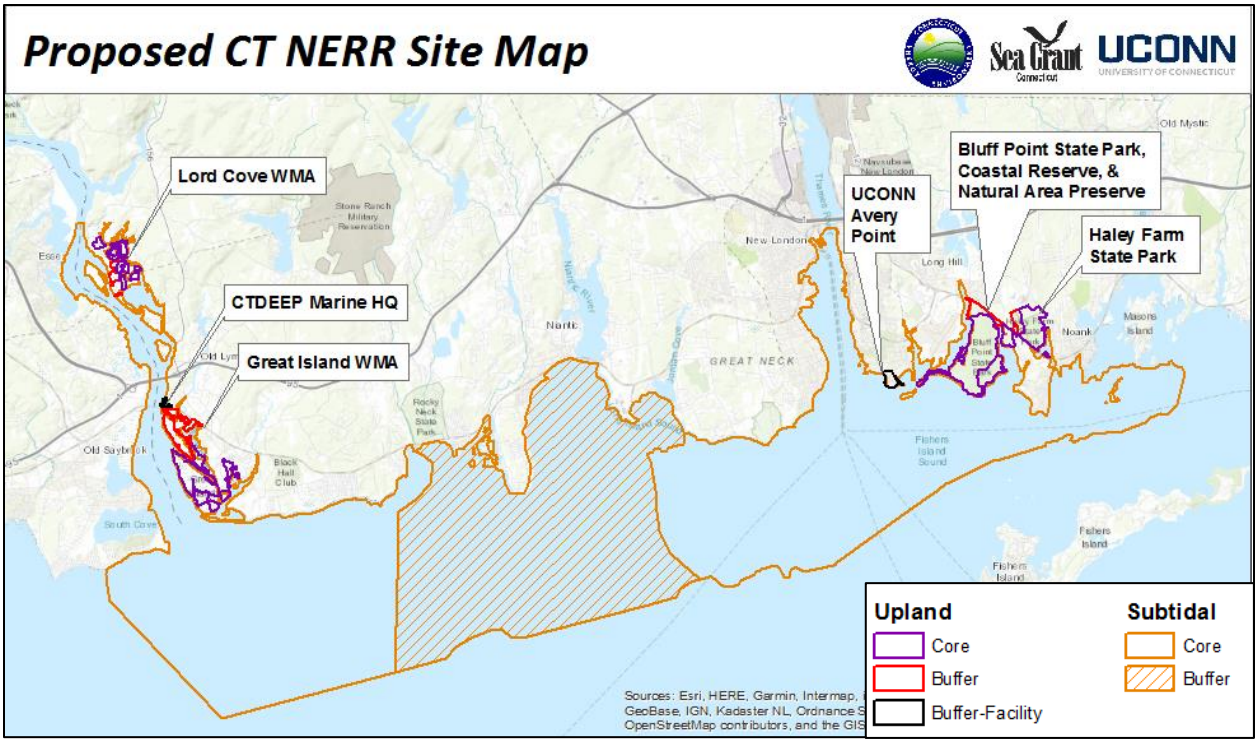


Figure 18: Map of proposed reserve based on the hybrid site.

When looking at the distribution of final scores, the Hybrid Site was identified as the high score by nine of the fifteen reviewers. ELIS was second with four high scores, and the Connecticut River third with two high scores. CLIS and WLIS scored well, but did not receive a high score by any reviewer. As there were two rounds of scoring with slightly different scorer compositions, three of the ELIS scores did not have a hybrid score to compete against and one of the Hybrid scores had no competing scores. If only those reviewers providing scores for all five sites were considered, the hybrid would have had eight high scores, ELIS one, and Connecticut River, two.

When considering the impact of selection criteria, Table 8 and Figure 19 show that the Hybrid site scored very highly across the board, representing the class lead in four of the five criteria groups: Environmental Representativeness, Education and Training, Acquisition and Management, and Resiliency. Although third to ELIS and WLIS in overall ratings for Research/Monitoring/Stewardship, the differentials were extremely close. Table 9 and Figure 20 illustrate this as well by showing the average score received by each site for each criteria group.

Table 8: Table showing component scoring of site by criteria group.

Component Scoring: Contribution of each Criteria Group to the Overall Score						
	Environmental Representativeness Component Score	Research / Monitoring / Stewardship Component Score	Education / Training Component Score	Acquisition / Management Component Score	Resiliency Component Score	Overall Score
ELIS	27.68%	14.43%	9.30%	23.07%	8.18%	82.66%
CT River	28.13%	12.95%	10.04%	23.88%	6.40%	81.40%
CLIS	24.11%	12.35%	7.96%	21.43%	6.85%	72.69%
WLIS	25.30%	14.29%	8.71%	16.96%	6.32%	71.58%
Hybrid	29.17%	13.89%	10.33%	24.39%	8.33%	86.11%

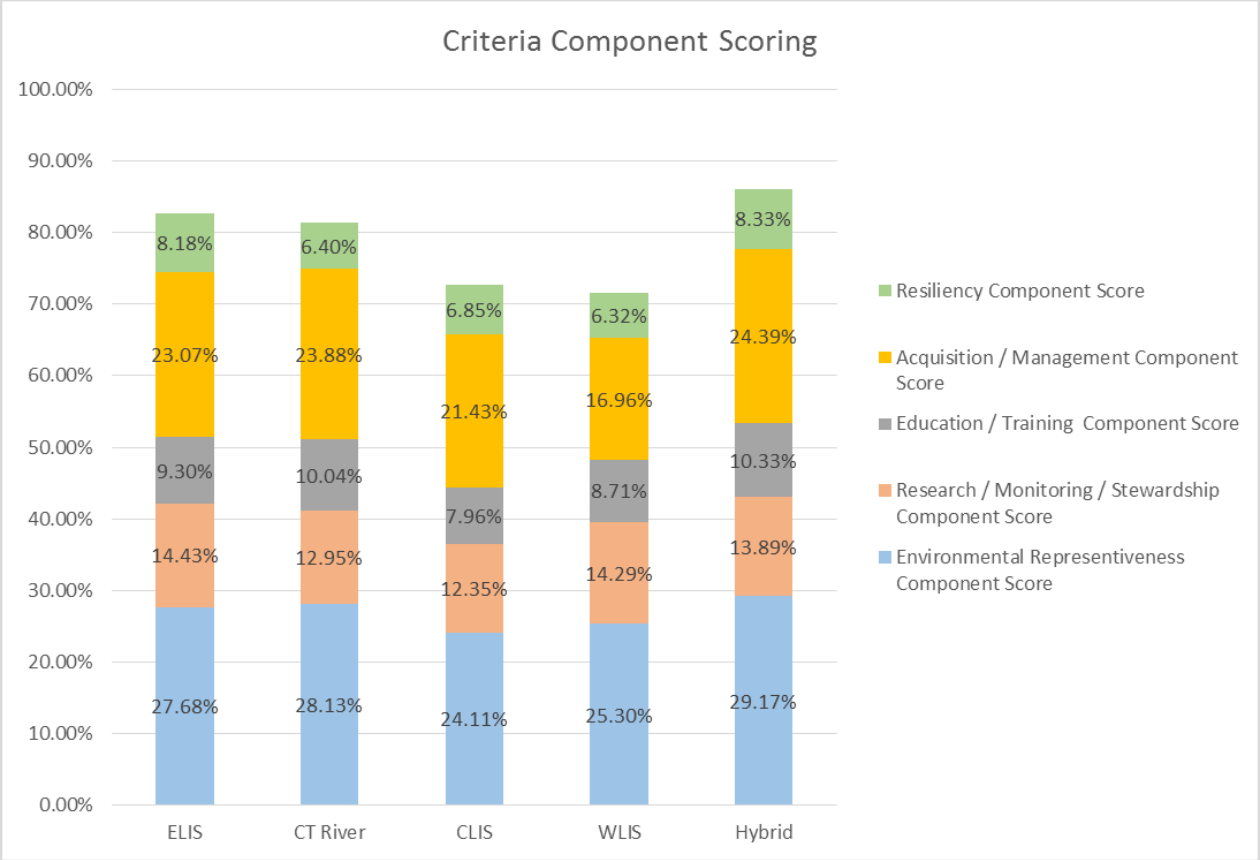
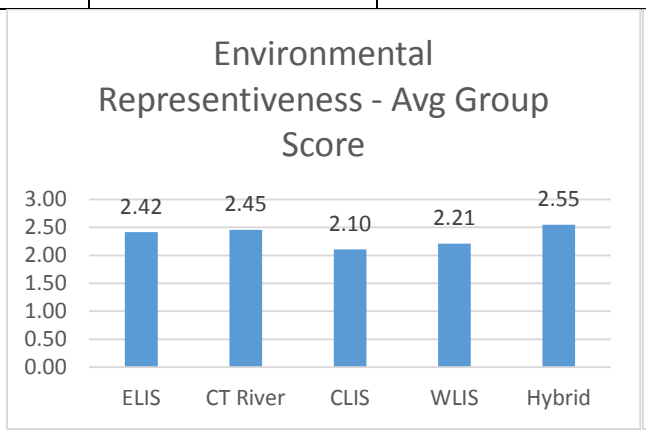
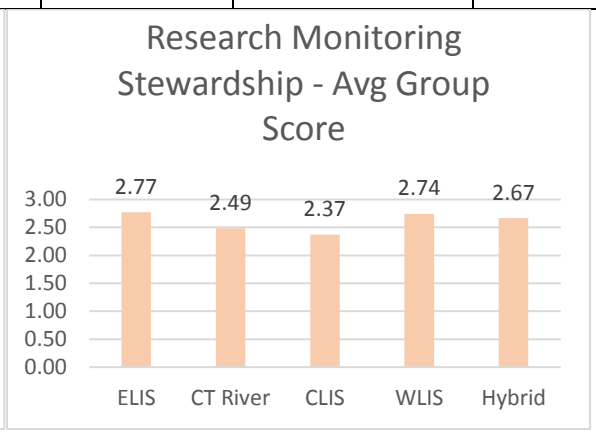


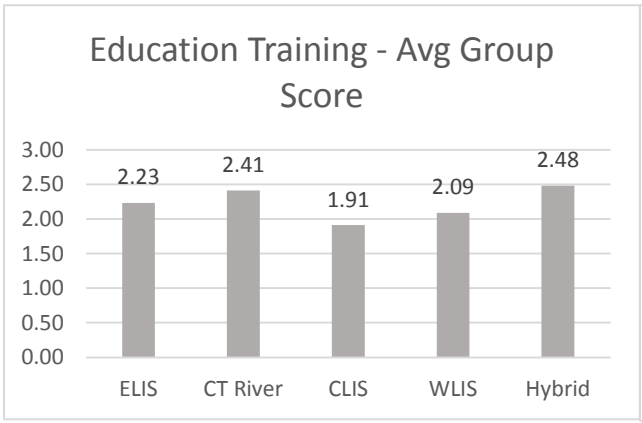
Figure 19: Chart showing component scoring of site by criteria group – graphic representation of values from Table 8.

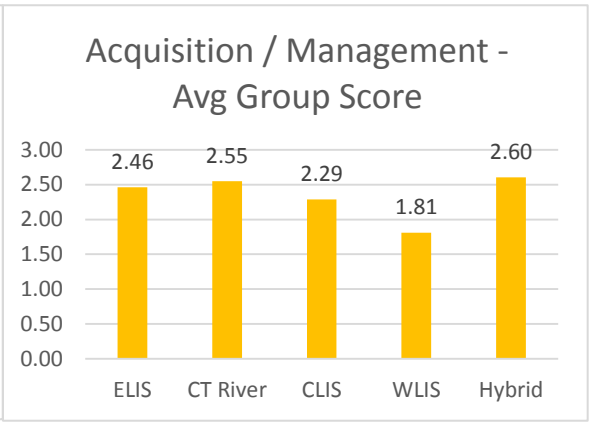
Table 9: Average scoring of criteria groups for each site; highest scores for each group are in bold.

Average Scoring of Criteria Groups					
	Environmental Representativeness Avg Group Score	Research / Monitoring / Stewardship Avg Group Score	Education / Training Avg Group Score	Acquisition / Management Avg Group Score	Resiliency Avg Group Score
ELIS	2.42	**2.77**	2.23	2.46	2.62
CT River	2.45	2.49	2.41	2.55	2.05
CLIS	2.10	2.37	1.91	2.29	2.19
WLIS	2.21	2.74	2.09	1.81	2.02
Hybrid	**2.55**	2.67	**2.48**	**2.60**	**2.67**









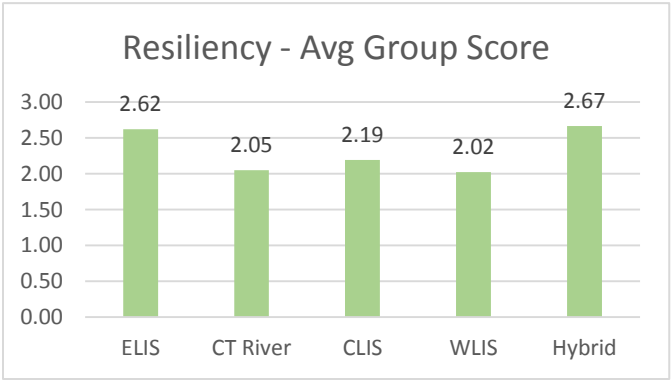


Figure 20: Charts of criteria group average scores by site.

Copies of the SST recommendation reports and scoring of the five sites can be found in Appendix 6. A complete inventory of the review and scoring materials is accessible via https://drive.google.com/open?id=0B5JvtMMeDBUJeUdselVBYzBKUzA, as some of the materials do not lend themselves to easily readable hardcopy formats.

Public Meeting Describing the Proposed Site

On Tuesday, November 13, 2018 a public meeting to describe the selection process and the proposed site and to seek public comments was held at the Avery Point Campus of the University of Connecticut in Groton, CT. Per NOAA regulations, this was posted in the Federal Register by NOAA on October 30, 2018 and notice was provided by DEEP to the Hartford Courant, the New London Day, and the Middletown Press on October 26, 2018. In addition, other announcements included:

- Invitations via email (sent three weeks prior with a reminder the preceding week) to:
    - over 200 individuals, organizations, and municipal officials whose roles or interests may overlap with the Reserve program;
    - Connecticut state legislators representing the NERR Project area towns; and
    - the Washington D.C. and Connecticut offices of U.S. Senators Richard Blumenthal and Chris Murphy and U.S. Representative Joe Courtney;
- Postings to electronic listservs:
    - CT Town Planners and Planning;
    - Long Island Sound Study Citizens Advisory Council;
    - Long Island Sound Study Scientific Advisory Committee;
    - DEEP “Sound Outlook” newsletter email distribution list;
- Postings to social media platforms (DEEP Facebook and Twitter, Long Island Sound Study Facebook;)
- A formal DEEP press release on November 9, 2018;
- Mailings and phone calls by CT NERR partners from the Roger Tory Peterson Estuary Center and Connecticut Audubon Society in the Lower Connecticut River.

Had Connecticut proposed a smaller, more compact reserve it may have been possible to identify and notify individual abutting landowners. However, given the expanse of the land and water areas included in the proposed site, the Steering Committee felt it was impractical to consider an attempt. Further, since the State of Connecticut is the primary land owner (and in the case of the subtidal areas the entity responsible for holding the public trust) the Steering

Committee, with NOAA's approval, felt the above approach was suitable for seeking broad public engagement. Approximately 175 individuals attended the event where NOAA provided an overview of the Reserve System and DEEP described the Site Selection Process and a profile of the selected site. This number greatly exceeded expectations based on the attendance from previous public forums. Staff from neighboring NERRs in Rhode Island and New York were also present to help provide insights in Reserve operations and to help answer questions. An hour-long question and answer session capped the night with many informed questions and comments.

A majority of the commenters provided vocal support for the Reserve, with typical questions revolving around how the processes would move forward, the determination of boundaries and/or the inclusion of various places or locations, and the impact a Reserve might have from a regulatory standpoint. Only one speaker offered what could be considered a negative take – while acknowledging the environmental importance, they disagreed with the statements that it would not result in new regulations.

At the time of submission, DEEP received 13 written letters of support from 21 organizations and individuals. Eight written comments, statements, or requests for more information were also received (Table 10.)

Table 10: Written comment summary table.

Individual/Organization	Support	Comment/ Question
Blacker, Kevin		X
Connecticut Ornithological Association	X	
Connecticut River Joint Commissions	X	
Robinson, David	X	X
Harbor Management Commission, Town of Essex		X
Stacey, Paul (Footprints in the Water LLC)	X	X
Friends of Whalebone Cove	X	
DEEP Fisheries		X
Weicker, Lowell (former U.S. Senator and Connecticut Governor)	X	
Tyler, Humphry (Lyme)		X
Needleman, Ned (CT State Senator-elect)	X	
Old Lyme Land Trust		X
Lower Connecticut River Valley Council of Governments	X	
Connecticut River Gateway Commission	X	
Lower Connecticut River Valley Regional Planning Committee	X	
Sherman, Roger		X

Individual/Organization	Support	Comment/ Question
Friends of Silvio O. Conte National Fish and Wildlife Refuge	X	
Connecticut River Conservancy (plus partners below:)	X	
Connecticut Council of Trout Unlimited (CT)	X	
Farmington Valley Chapter of Trout Unlimited (CT)	X	
Farmington River Watershed Association (CT)	X	
Chicopee 4 Rivers Watershed Association (MA)	X	
Millers River Watershed Council (MA)	X	
Lyme Land Conservation Trust (CT)	X	
Rivers Alliance of Connecticut (CT)	X	
Zyla, Alison Mystic Aquarium	X X	

A copy of the meeting invitation materials, a summary of the comments discussed at the meeting, and copies of all written comment and support letters are included in Appendix 7.

Proposed Management and Operational Partners

Upon acceptance of the nomination by NOAA the Steering Committee, along with project partners UCONN, Connecticut Sea Grant, and DEEP, will lead the effort to develop a Management Plan for the Reserve. As in the Site Selection phase, DEEP will continue in the lead state role to coordinate and carry out Connecticut's responsibilities, in close coordination with NOAA. While the formal structure of this effort has yet to be developed, it is envisioned to include representation from organizations or individuals that have a geographic and/or operational connection to the proposed Reserve.

Existing ownership and primary responsibility of the land and water areas will not change as a result of the designation of a Connecticut Reserve. The state parks, wildlife management areas, coastal reserves, and natural area preserves within the proposed Connecticut NERR will continue to remain within DEEP. The facility areas of DEEP Marine Headquarters and the UCONN Avery Point campus will remain under the ownership and management of DEEP and UCONN, respectively. Management of the public trust waters and resources will remain under their current statutorily defined entities including, but not limited to DEEP, local shellfish and harbor management commissions, the Department of Agriculture/Bureau of Aquaculture, etc.

It is important to note that NOAA recognizes there is no one-size fits all management model, and encourages states to seek structures that best leverage their own unique resources to support their Reserve's missions. As such, responsibility for the overall management of the

Connecticut Reserve will be finalized during the subsequent management planning steps. It is expected that regardless of which organization assumes the management capacity, both DEEP and UCONN will have formal roles to address the various research, education and resource management objectives of the NERR based on areas of expertise. These roles and their responsibilities will be fully explored and defined during the subsequent phases, and once finalized, be codified via Memoranda of Agreement (MOA). A MOA will exist between the reserve management organization and NOAA, as will MOAs between DEEP and UCONN. Since the management planning phases will also rely on external stakeholder input, it is possible that other parties may express an interest to support the Reserve. For example, organizations such as The Nature Conservancy and the Connecticut Audubon Society's Roger Tory Petersen Estuary Center - who were part of the Site Selection process – or other local/regional groups, may wish to formally or informally engage with the Reserve in some fashion. As needed, these will be reviewed and addressed accordingly, via additional MOAs or other appropriate measures.

Interstate Issues / Tribal Considerations

The proposed Reserve is located wholly within the statutory boundaries of the State of Connecticut. During the course of the Site Selection process no past, current, or expected issues relating to the establishment of a Connecticut reserve that might affect neighboring states were uncovered or brought forth. Further, while Connecticut does have two active tribal nations in southeastern Connecticut (the Mashantucket Pequot Nation and the Mohegan Nation), none of the upland properties are owned by the tribes, and no instances of tribal ownership or interest in the subtidal areas was uncovered. Although both nations were invited to the two public meetings in 2017 and 2018, no comments were received.

CONNECTICUT NERR SITE DESCRIPTION

The proposed Connecticut NERR site (referred to as the 'Nominated Reserve' for the remainder of this report,) is a large and diverse mosaic of a variety of upland and aquatic habitats.

Site Boundaries

The proposed boundary for the Nominated Reserve comprises a total land and water area of approximately 47,890 acres.

The landward components (totaling approximately 1,890 acres) include the following state properties, owned and managed by the Connecticut Department of Energy and Environmental Protection:

- Bluff Point (850 acres): Bluff Point is subdivided into 3 components – Bluff Point State Park, Bluff Point Coastal Reserve, and Bluff Point Natural Area Preserve.
- Haley Farm State Park (275 acres):
- Great Island Wildlife Management Area (565 acres):
- Lord Cove Wildlife Management Area (200 acres)

The offshore components (totaling approximately 46,000 acres) include the public trust waterbodies generally defined by:

(a) Long Island Sound ranging approximately west to east from the mouth of the Connecticut River to Mason's Island and north to south waterward of the mean-high-water shoreline to just shy of the Connecticut state boundary in Long Island Sound;
(b) the area waterward of the mean high shoreline of the lower Thames River from approximately the Gold Star Bridge south to the area described in (a);
(c) the area waterward of the mean high shoreline of the lower Connecticut River from approximately Lord Cove south to the area described in (a).

The core and buffer areas are described as follows:

Core and Buffer Areas

NOAA requires Reserves to identify "core and "buffer" areas. Core areas refer to areas so vital to the functioning of the estuary ecosystem that they must be under a level of control sufficient to ensure the long-term viability of the reserve. Buffers denote areas, typically adjacent or near to core areas that serve to protect the core and may also accommodate future habitat shifts. Buffers also include facility areas.[7] The preliminary delineation of core and buffer areas are as follows.

Upland Core Areas – Bluff Point/Haley Farm:

In Bluff Point, making the Coastal Reserve and the Natural Area Preserve (NAP) components "core areas" is a sensible and practical approach. The rationale of the Coastal Reserve and NAP (described below) directly align with the intent of core areas.

[7] NERR Core and Buffer areas: CFR 15 921.11c(3)

- Coastal Reserve: established to preserve native ecological associations, unique faunal and floral characteristics geological features, and scenic qualities in a condition of undisturbed integrity;
- "Natural area preserve" means a natural area (an area of land or water, or land and water, containing, or potentially containing, plant or animal life or features of biological, scientific, educational, geological, paleontological, or scenic value worthy of preservation in their natural condition) which has been approved by the commissioner and designated by the Governor.

For Haley Farm State Park, the data used for NERR Criteria 1.1 Assessment show the vast majority of the site to be dominated by forest types (upland and wetland.) When moving in a general progression from the land/water interface at Palmer Cove to the northwest corner of the property, these habitats, plus all other unique habitat types are included in the largest of the four parcels comprising the park. This area in particular will represent key areas for research and monitoring and well-represent the overall ecosystem and is therefore considered as a core area

Upland Buffer Areas - Bluff Point/Haley Farm:

In Bluff Point, the State Park component of the property is appropriate to include within the buffer designation largely because the ecological designations of the Coastal Reserve and Natural Area Preserve are best served as the core areas. Further the State Park area could potentially facilitate shifting of certain habitat types. In Haley Farm State Park, the most upland habitat class (upland forests) is of a size, location, and distribution within the Park that it could lend itself to be subdivided. A substantial percentage was included in the core area, and thus the rest (the three smaller parcels on the western side of the property) is included within the buffer with the assumption that it could facilitate a shift in habitat types if needed.

The UCONN-Avery Point Marine Science Campus – located just to the west of Bluff Point and can potentially serve as a general hub for research, education, and administration - is included within the buffer.

Figure 21: Bluff Point and Haley Farm core areas.

- NERR Typological Shorelands/Transition Areas in the core areas consist of:
  - Intertidal Flats
  - Intertidal Beaches
  - Coastal Marshes
  - Cliffs/Bluffs
  - Coastal Non-tidal wetlands
  - Coastal Shrub/Grasslands
  - Maritime Forests
- In addition to some developed areas/infrastructure, NERR Typological Shorelands/Transition Areas included in the buffer areas consist of:
  - Coastal Marshes
  - Maritime Forests
  - Developed areas/infrastructure

<u>Upland Core Areas – Lower Connecticut River: Great Island/Lord Cove</u>

Both Lord Cove and Great Island are almost entirely salt-marsh dominated habitats and as such represent not only a key ecological unit within the proposed Reserve but also the Connecticut

River estuarine system. Therefore, nearly all of Lord Cove and most of the Great Island properties towards the mouth of the Connecticut River are best classified as core areas.

Upland Buffer Areas – Lower Connecticut River: Great Island/Lord Cove

To help discriminate these areas further, recent (2017) Sea Level Affecting Marshes Model (SLAMM) predictions were examined to understand the potential impacts of rising sea levels on these marshes – possibly one of the more significant potential factors on the long-term ecosystem composition of the River. Areas that exhibited a reasonably high likelihood (better than 50%) of retaining a mix of high and low marsh features, were classified as buffer areas since they may be able to accept a habitat shift and provide a measure of diversity in ecological composition in the face of possible SLR scenarios on the order of 25-50 years in the future.

The DEEP Marine Headquarters - located immediately north of the Great Island Wildlife Management area and can serve to support aspects of research, education, and administration - is included within the buffer.

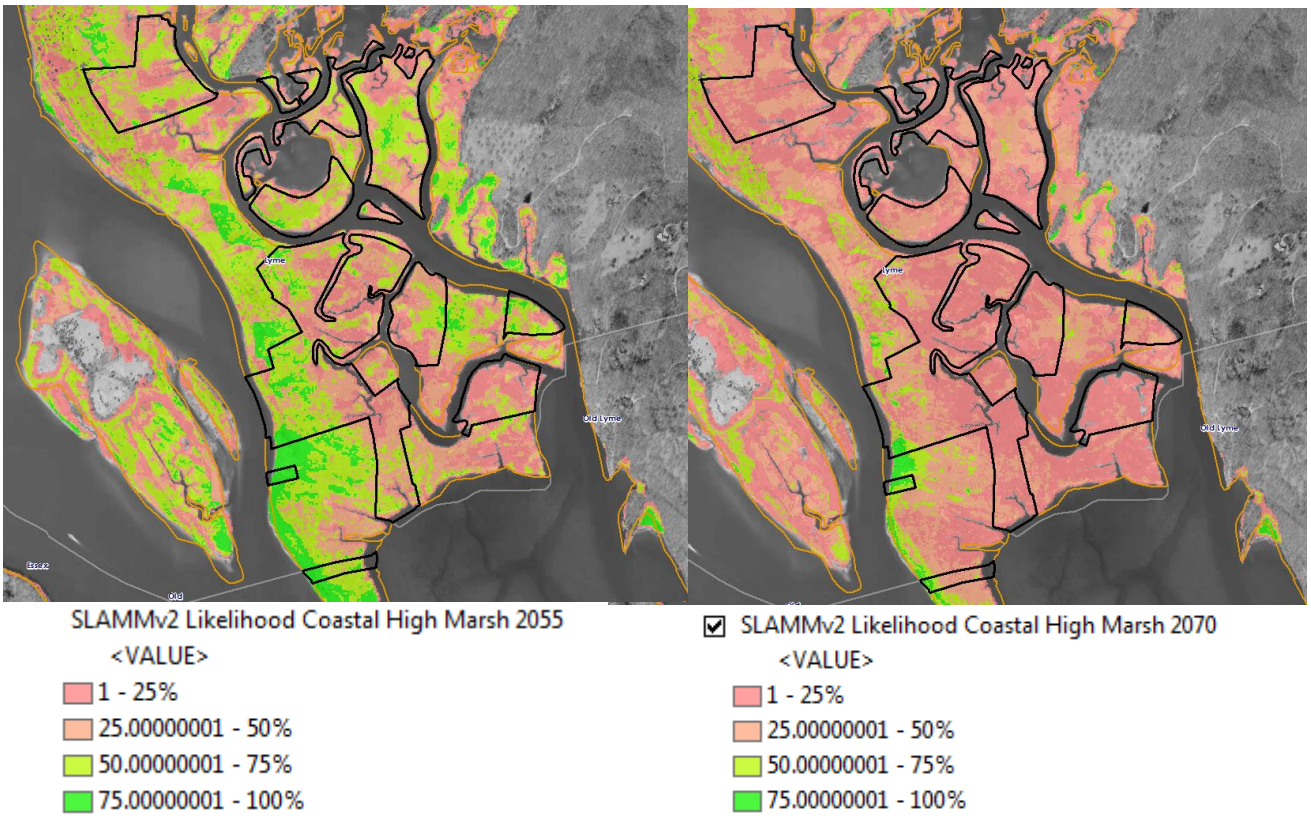


Figure 22: Lord Cove SLAMM Predictions.

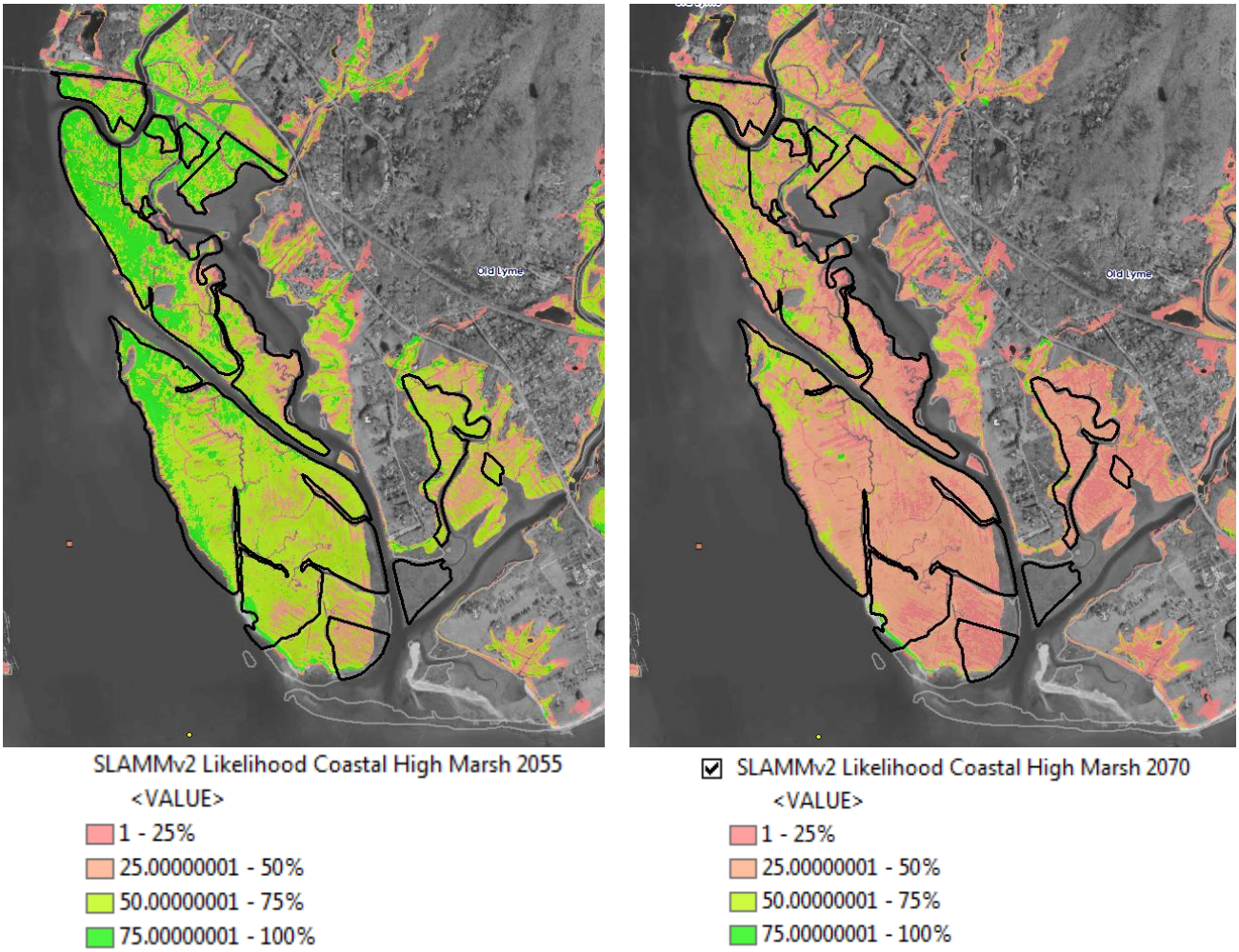


Figure 23: Great Island SLAMM Predictions.

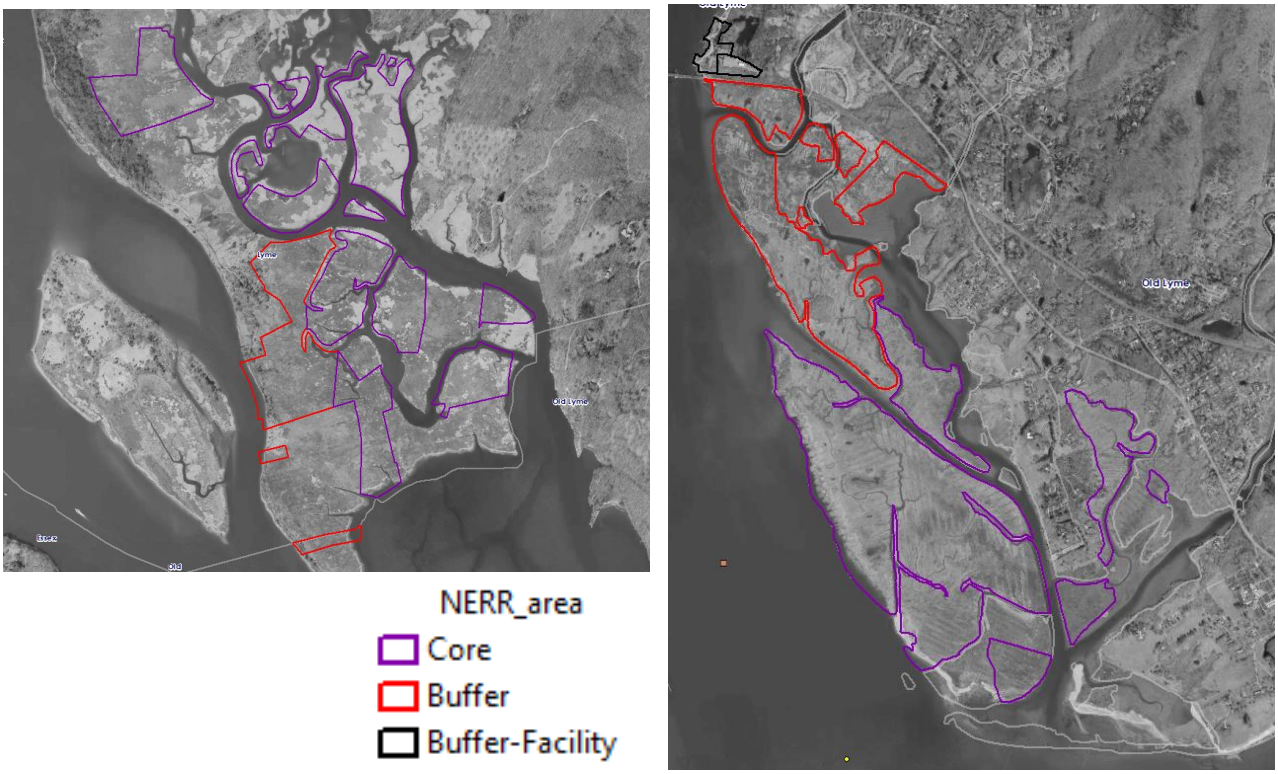


Figure 24: Core and buffer areas of Lord Cove and Great Island.

- NERR Typological Shorelands/Transition Areas in the core areas consist of:
  - Intertidal Flats
  - Coastal Marshes
- NERR Typological Shorelands/Transition Areas in the buffer areas consist of:
  - Coastal Marshes
  - Developed areas/infrastructure

<u>Subtidal/offshore Zone - Core Areas:</u>

Core areas in the subtidal water of the Nominated Reserve are delineated to generally focus on areas of hardbottom (reefs, ledges, surficial sediment areas, rock/rocky/boulder features,) surrounding areas of variable softbottom sediment types, and areas mapped as SAV (eelgrass and other) inclusive of depth ranges from shallow (just below the public trust shoreline) to deep (> 150 ft.) This is reflective of the strategy used to address the new typological aspects provide by the Connecticut Reserve vs. other reserves within the biogeographic region, as well as to target areas conducive to a broad range of potential research topics and opportunities. Within these areas, further emphasis was placed on assembling component areas proximal to the

upland sites rather than many smaller disparate areas. Thus, there are two zones "anchoring" the eastern and western ends that constitute core area.

Subtidal/offshore Zone - Buffer Areas:

The interior zone between the two core areas has less of a direct, physical tie to the upland sites but still retains aspects of typological uniqueness in terms of sedimentary composition and varying depth regimes, is held as a buffer in that it can likely accommodate possible habitat shifts from the core that might result from the expected effects of warming waters, sea level rise, or increased acidification, to name a few.

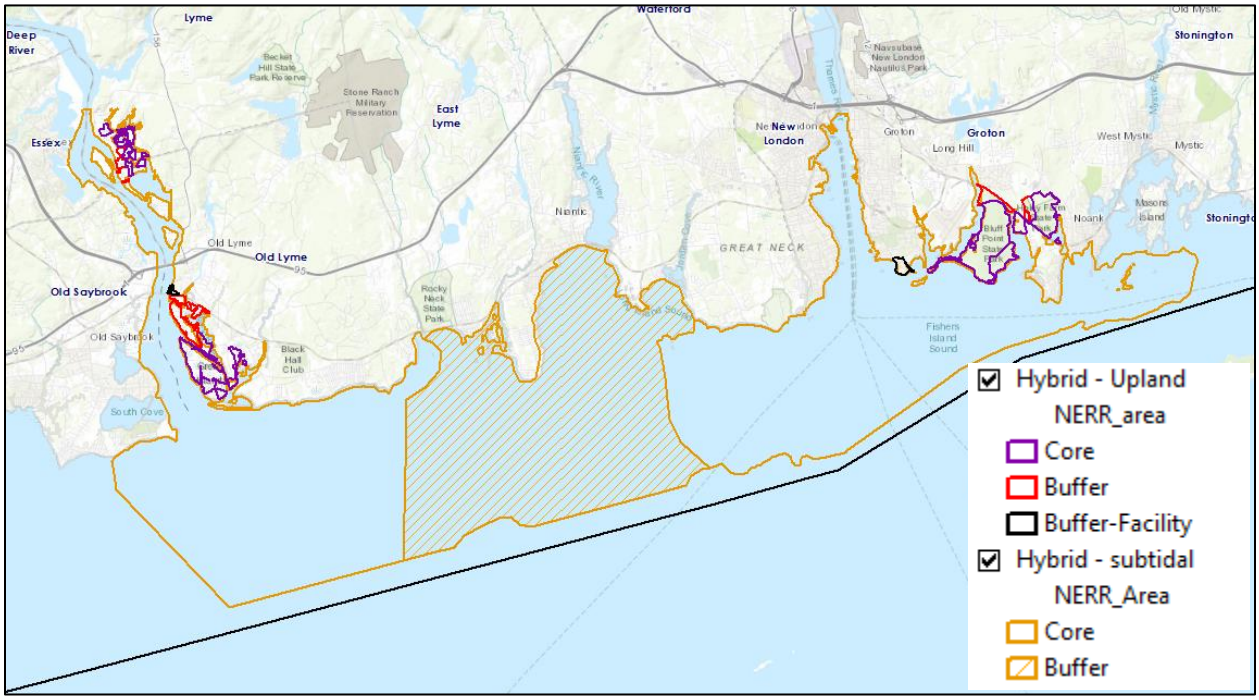


Figure 25: Land-based and Offshore core and buffer areas.

Physical Setting

Climate

The coastal region of eastern Connecticut spanning the footprint of the Nominated Reserve can be generally characterized as a combination of Humid Subtropical and Temperate Ocean climates, bringing mix of hot, humid summers with milder winters consisting of a mix of rain with

infrequent snow.[8] Average monthly temperatures (in degrees Fahrenheit) can range from lows in the 20s in January to highs above 80 in July and August. Average annual temperatures range from the mid-40s to low 60s. Rainfall is fairly consistent throughout the year at about 4 inches per month. The average annual snowfall is about 24 inches, with the highest average amounts occurring in January and February.[9]

Hydrography / Oceanography

The Nominated Reserve features a combination of a large area of eastern Long Island Sound and the mouths of two major Connecticut riverine systems – the Connecticut River and the Thames River. All areas are governed by a semi-diurnal tidal cycle of two highs and two lows.

For the Long Island Sound component of the Nominated Reserve, (exclusive of the major riverine systems of the Connecticut and Thames) the mean tide range is approximately 2.7 feet (increasing to 3.2 feet on a spring tide) although these values will differ in various embayments. Water temperatures can vary from 0 degrees Celsius in the winter to 20 degrees Celsius in the summer, but are moderated daily by the large volume of water. Temperatures in the embayments are influenced by the temperatures in the Sound, but also flushing rates, depths, and solar radiation. Bottom waters in embayments can range annually from 2 to 24 degrees C while surface waters can range annually from 0 to 30 degrees Celsius. Halinity across most of the area is relatively constant, averaging 30-32 parts per thousand (ppt) at the bottom and 28-30 ppt at the surface. This horizontal and vertical gradient generate characteristic circulation patterns which continue throughout the tidal cycle. At depths of less than 65 feet, the bottom waters flow shoreward where they mix with surface waters. In the embayments, halinity regimes are influenced by freshwater at their heads and are at their lowest during periods of Spring runoff. Highest values typically occur in the summer when rainfall is low and air and water temperatures are high. Additional freshwater inputs from areas of surface water in-flow and where tributaries drain also affect levels.[10] Average current speeds can range between 1.2 to 2.0 knots on a flood tide and between 0.8 and 3.1 knots on an ebb tide.[11]

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[8] Wikipedia Connecticut Climate: https://en.wikipedia.org/wiki/Connecticut#Climate
[9] US Climate Data: https://www.usclimatedata.com/climate/groton/connecticut/united-states/usct0087/2010/1
[10] Natural Resources Inventory of and Management Recommendations for Bluff Point Coastal Reserve and State Park, Groton, CT. Unpublished Connecticut Department of Environmental Protection report.
[11] NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/currents14/tab2ac3.html

Both the Connecticut and Thames Rivers display salt wedge estuarine structure whereby river circulation creates a distinct boundary between an upper low-salt concentration layer, and a high-salt concentration wedge beneath it. Tidal ranges in the mouths of both rivers are somewhat comparable at approximately 2.5 feet in the Thames and 3.5 feet for the Connecticut.[12] While both contribute significant freshwater inflows to Long Island Sound, the Connecticut River contributes the lion's share – just under 20,000 cubic feet per second, or about 70% of total freshwater input.[13] Further, the Connecticut has a different seasonal cycle from the Thames due to the significant size and extent of its watershed (ranging from Long Island Sound to mountains of northern New England and Canada) which results in large spring freshets and sediment plumes. The salinity ranges in the marshes and near the beaches of the Connecticut river can vary quickly and extremely – variations from 0 to 26 ppt in a day have been recorded. Variations in the mouth of the Thames are also substantial, but not as extreme – here the range can be 16 to 28 ppt.[14]

Geology[15]

Regional Overview: The rock dominated coastline of eastern Connecticut shows irregularities that reflect the shape of the underlying bedrock surface. Seventeen glacially smoothed bedrock hills of various sizes extend seaward forming points, and fifteen glacially modified bedrock valleys underlie the intervening embayments. The points are typically overlain by a blanket of thin till and the valleys are filled with layered sands and gravels (Eastern margin deltaic deposits) deposited as deltas in Glacial Lake Connecticut. Wave action against the till covered bedrock points removes any fine glacial material and leaves behind a cobble/boulder lag sitting on bedrock. Ledges that commonly occur on the seaward side of the rocky points are generally attributed to "plucking" of rock material by southward moving glacial ice. This glacial plucking is the source of the glacial boulders that dot the landscape. Natural sandy beaches and spits develop in the valleys between the points as wave action erodes the sands and gravels of the glacial deltas. The size of these beaches/spits is limited by the size of the delta supplying their sediment. Owing to the fact that the glacial delta surfaces are low and flat, they are the first to be inundated as sea level rises, and they are where marshes have developed.

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[12] NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/currents14/tab2ac3.html
[13] RAMSAR nomination report: https://nctc.fws.gov/resources/knowledge-resources/pubs5/ramsar/begin.htm
[14] Personal communication – Dr. James O'Donnell, University of Connecticut Marine Sciences Dept. 7/19/2017
[15] Personal communications – Ralph Lewis, Connecticut State Geologist (ret). August, 2017.

In contrast to the rock dominated coastline of Eastern Connecticut, the Connecticut River occupies a section of coastline that is sediment dominated. A complex of overlapping glacial deltas overwhelmed and buried the glacially smoothed bedrock surface (hills and all) as meltwater streams delivered large quantities of sediment to Glacial Lake Connecticut. Coastal irregularities result from the presence of boulder and cobble laden recessional moraine ridges. The composition and shape of these makes them more resistant to coastal retreat than the surrounding, low-lying, glacial delta sands and gravels. As a result, they form moraine-armored points. Where the moraines are subjected to wave action, fines are removed and boulder/cobble beaches develop. As is typical all along the Connecticut coast, where glacial delta deposits are subjected to wave erosion, the size of the sandy beaches/spits that form is limited by the size of their deltaic sand source, and the low flat delta surfaces become a platform for extensive marsh development in a rising sea.

Upland Locations: Haley Farm and Bluff Point are all representative of the general geologic character of the Eastern Region of coastal Connecticut. However, several examples of interesting geologic features are contained within the boundaries of the Bluff Point complex. A nice example of a barrier spit which developed from erosion of the glacial deltaic sands and gravels that fill the valley between Avery Point and Bluff Point. The large size of this glacial delta allowed for the development of a comparably sized spit and provided an expansive substrate for the marsh complex that has grown over it. The Mystic recessional moraine that extends from Pine Island, through Bushy Point, underlies the marsh behind the barrier spit and crosses the northern third of the glacially-smoothed Bluff Point bedrock ridge. On Bushy Point, the wave action has winnowed out finer components of the moraine and glacial boulders, cobbles and exposed bedrock form the beach. The cliff at the seaward end of Bluff Point forms a true bedrock bluff (more than 10 feet in height). Owing to the highly fractured bedrock there, freeze and thaw cycles weather the bedrock into angular blocks of various sizes. Over time these fall to the base of the bluff forming an angular boulder/cobble beach. In addition to this angular boulder/cobble beach, and the rounded boulder/cobble beaches of Bushy Point, four other distinct beach types exist at the Park. The sandy/gravely beach of the barrier spit, the cobble beach between Bluff and Mumford Points, the adjacent large glacial boulder/bedrock beach (both derived from wave erosion the thin till blanket), and the exposed bedrock of Mumford Point. Each of these different beach types has its own compositional and ecological character.

Within the Connecticut River, the Lord Cove and Great Island marshes represent typical marshes resulting from the basic geological context. However, a recessional ice position is

inferred to extend eastward under Great Island. Based on this, the southern half of the Great Island marsh would be underlain by the erosional remnant of a glacial delta that was deposited between Saybrook Point ice position and the Saybrook-Wolf Rocks moraine just to the south. The northern half of the Great Island marsh are underlain by deltas that built south from the younger Ferry Point ice position.

Offshore Area: The subtidal area offers several noteworthy components. Submerged portions of the bedrock points often extend seaward as identifiable bathymetric features (e.g. boulder reefs and exposed bedrock outcrops associated with Bartlett Reef and Rapid Rock extend at least a mile offshore from the Waterford coast). Glacial delta deposits extend offshore of most embayments and the mouth of the Thames River, and partially eroded lake bottom deposits of Glacial Lake Connecticut underlie eastern LIS. This erosion locally exposes bedrock north of the Race. Evidence for the draining of Glacial Lake Connecticut comes in the form of the stream channels that cut across the glacial lake deposits. Bedforms of various sizes (some quite large) are common in areas just north and west of the Race. Their presence indicates a lot of modern sediment transport along the bottom of southeastern LIS. While the overall offshore area is dominated by Glacial Lake Connecticut Deposits (primarily Deltaic, Lake Bottom, & Lacustrine Fan, with the last being the rarer of the three,) it also contains rarer still Glacial Ice laid Deposits. The area is noteworthy as it is intersected by three southeast-to-northeast trending moraines: the Old Saybrook/Wolf Rocks, Mystic, and Clumps-Avondale Moraines. These moraine formations are concentrated in the western and eastern ends of the offshore areas.

Water Quality

DEEP maintains a robust water quality monitoring program dating back to the early 1990s.[16] This data, in conjunction with information from the EPA's Long Island Sound Study National Estuary Program (NEP) and other sources, can provide several reportable metrics to describe the water quality in the area of the Nominated Reserve.[17]

- Hypoxia (as measured by the frequency of years where Dissolved Oxygen levels < 3.0 milligrams/liter) were present from 1994 to 2017) falls into the range of 0 to 10% for

[16] CTEEP LIS Water Quality Monitoring Program: https://www.ct.gov/deep/cwp/view.asp?a=2719&q=325616&deepNav_GID=1654
[17] LISS Water Quality metrics: http://longislandsoundstudy.net/ecosystem-target-indicators/water-quality-index/

most of the offshore site area. This contrasts to waters in the Western areas of Long Island Sound where the metric shifts drastically to 90 to 100% (NOTE: The eastern portion of Long Island Sound east of the Thames River is not covered by the analysis.)

- The eastern and central LIS basins (containing the entirety of the offshore the Nominated Reserve area) as measured by EPA National Coastal Assessment (NCA) Index are rated as either good or fair for 99% of the sampling visits over a 20-year sampling period. The NCA is based on five chemical and biological measures:
    - Nitrogen (Dissolved inorganic nitrogen in surface waters)
    - Phosphorus (Phosphate, or PO4, in surface waters)
    - Chlorophyll a (in surface waters)
    - Dissolved Oxygen (in bottom waters)
    - Water Clarity (Secchi disk depth)

  Good water quality is defined here as water containing low concentrations of nitrogen, phosphorus and chlorophyll a, high concentrations of dissolved oxygen and high water clarity.
- Additional factors that have a direct influence on water quality are measures of development and impervious surface (both within the site and in the site's watersheds.) In total, less than 2% of the site's upland areas are classified as 'developed' based on recent (2010) land cover data. Here developed reflects high-density built-up areas typically associated with commercial, industrial and residential activities and transportation routes. These areas can be expected to contain a significant number of impervious surfaces, roofs, roads, and other concrete and asphalt surfaces. Within the watershed, and looking specifically at impervious surface cover, nearly 83% of the watershed has impervious surface coverage within the 0 to 25% range, and only 10% is classified as having greater than 50% Impervious surface coverage.)
- Water quality measures for the riverine components of the Lower Connecticut and Lower Thames River can be qualified via the recent (2016) DEEP Integrated Water Quality Report[18], established pursuant to the requirements of Sections 305(b) and 303(d) of the Federal Clean Water Act. Using data from both DEEP ambient monitoring and USGS physical, chemical, and bacteria data collections, the main stems of both rivers received the following assessments based on five classes of uses:

[18] DEEP 2016 Integrated Water Quality report:
http://www.ct.gov/deep/lib/deep/water/water_quality_management/305b/2016_iwqr_draft.pdf

Table 11: Water quality metrics from 2016 DEEP Integrated Water Quality Report.

	Designated Uses				
Waterbody Name	***Aquatic Life***	***Recreation***	***Fish Consumption***	***Shellfish Consumption***	***Shellfish Classification***
Connecticut River (Lower) Essex	Unassessed	Unassessed	Not supporting	Commercial Harvesting	Unassessed
Connecticut River (Mouth) Old Lyme	Unassessed	Unassessed	Not supporting	Commercial Harvesting	Unassessed
Thames River (Mouth) New London	Not Supporting	Fully Supporting	Fully Supporting	Commercial Harvesting	Not Supporting

In addition to the metrics from Table 10, the presence of eelgrass can be used as a general proxy for water quality. Eelgrass thrives in a low nutrient environment with good water clarity; it is widely believed (though not conclusively determined) that nitrogen enrichment is a primary driver of wide-spread, large scale areas of eelgrass declines in the coastal water of the US. LIS is not exception, with extensive areas having died out in the 1930s. Recolonization has failed in the western and central areas of the Sound – which have overall lower measures of water quality, but beds in the Eastern basin, which includes the offshore areas of the Nominated Reserve, have experienced an overall recovery. This resurgence has been tempered, as declines in certain eastern LIS embayments containing or near point and non-point nutrient load sources have been documented. It is important to note that a dramatic exception to embayments that lack eelgrass is Mumford Cove, the waterbody immediately adjacent to Bluff Point on the eastern side. Here the likely reason for the substantial resurgence of eelgrass in the cove was the removal of the Groton sewage treatment discharge 1987. Although it took several years to establish a thriving meadow, the recovery of eelgrass in

Mumford Cove does provide strong evidence that improving water quality can create favorable conditions for eelgrass colonization and growth.[19]

Site Components and Habitat Types

The Nominated Reserve is composed of 4 upland properties and an offshore area including parts of Long Island Sound and the lower Connecticut and Thames River areas. Each possesses a variety of habitat types. An overview description of each component is listed below.

Haley Farm[20]: The park is a mosaic of upland and wetland vegetation types. Algae and intertidal plants can be found on the shore, including salt meadow grass, sedge and sphagnum moss. The swampy areas of Haley Farm State Park have red maple and tulip trees, but the uplands include cherry, hickory and shrubs. In 1973, a white oak on the site was found to be 142 years old, in the upper end of the life expectancy of the species.

[19] An Assessment of the Impacts of Commercial and Recreational Fishing and Other Activities to Eelgrass in Connecticut's Waters and Recommendations for Management. Connecticut Department of Environmental Protection / Department of Agriculture report. 2007

[20] Barrett, J., Long Island Sound Stewardship Ecological Sites Inventory Update. Long Island Sound Study / New England Interstate Water Pollution Control Commission report. 2014. Assessment record for Haley Farm State Park

Figure 26: View from Haley Farm State Park walking trail, showing Palmer Cove. Photo credit: DEEP.

Bluff Point: The backbone of this 800+ acre peninsula is a streamlined hill approximately 1.8 miles in length. It is underlain by bedrock and is technically referred to as a drumlinoid hill. Typical of hills in the eastern coastal ecoregion of Connecticut, the elevations are somewhat low. The maximum elevation is about 130 feet in the north-central area. Elevations gradually increase from the southern shore to this area, and the summit lands or predominantly level. Along the southern shore are coastal bluffs or sea-cliffs. Relief of these average about 10 feet high, and attain a maximum of 20 feet above the beach at "Bluff Point." The area to the east contains over half a mile of continuous sandy barrier beach. In total, there are over three-quarters of a mile of beachshore.[21]

The natural habitats found here include coastal woodlands, beach and dune grasslands, coastal plain ponds, coastal bluff, tidal wetlands, intertidal mud flats and offshore eelgrass beds. Because of this unique combination of habitats, a variety of plants and animals live in the area.

[21] Natural Resources Inventory of and Management Recommendations for Bluff Point Coastal Reserve and State Park, Groton, CT. Unpublished Connecticut Department of Environmental Protection report.

Coastal woodlands cover much of the peninsula. The major tree types are oak and hickory, with shrubs of blueberry and black huckleberry. Catbrier and Asiatic bittersweet have formed dense thickets in some disturbed areas. Where the soils are thicker, such as on the eastern slopes of Bluff Point, more herbaceous species occur. Here the trees are approximately 70 to 90 years old.

Figure 27: Fringe of interior woodlands along the eastern walking trail at Bluff Point. The shore of the Poquonnock River is just visible to the right. Photo credit: DEEP.

The open grasslands are dominated by switchgrass and little bluestem. These grasslands contain a variety of plants that are preferred habitat for some insects and birds.

The coastal bluffs at the southern tip of the point are affected by salt spray. Only plants that tolerate such conditions can live here. These include bayberry, sumac, Japanese honeysuckle, Asiatic bittersweet, switchgrass, beach rose and poison ivy.

Figure 28: Coastal bluff as seen from the western side of Bluff Point. Photo credit: DEEP.

The dunes behind Bushy Point beach are dominated by beach grass. Salt-spray rose and beach pea form scattered thickets on the back side of the dune. These plants are critical for stabilizing the dunes, which prevent wind from carrying away the sand and waves from entering the marshes behind the dunes. Because of the sifting nature of sand, perennial plants are often uprooted, especially on the upper reaches of the beach. Thus, many beach plants are annuals whose seeds move around during the winter to come up in a new location the next spring. They also are plants that can withstand the salt spray received from the high waves of storms. These include Russian thistle, seaside goldenrod, sea-rocket, and seaside spurge.

Figure 29: The barrier beach at Bushy Point, as seen from the bluffs. Long Island Sound appears in the foreground. The Poquonnock River can be seen in the background behind the beach. Photo credit: DEEP.

Behind the Bushy Point beach and extending along the trail to the beach is a large tidal wetland. Marsh makes up most of the wetland, providing a highly productive food, shelter and breeding habitat for numerous invertebrates, fish and birds. A comprehensive study of salt marsh plants has not been done, but a progression of vegetation, from the upper to lower marsh areas can be expected to include phragmites, bayberry, marsh elder and black grass in the upper boundaries; salt marsh hay, spike grass, glasswort and sea lavender in the high marsh zone; and salt water cord grass dominating the low marsh.

Figure 30: The tidal wetlands and back shore dunes of Bushy Point Beach. Long Island Sound can be seen in the background. Photo credit: DEEP.

Near the mouth of the Poquonnock River a saltwater intertidal flat provides a spawning and nursery area for winter flounder, as well as other finfish and shellfish. A similar intertidal flat occurs on Mumford Cove. Both the Poquonnock River and Mumford Cove have areas of established eelgrass beds.

Over 200 bird species have been seen at this site, including a number that are uncommon in Connecticut. Many of these uncommon species occur in migration, when Bluff Point acts as a landfall in the spring and a land trap in the fall. The result is that it attracts a wide species diversity and large numbers of individual birds. There is also a great diversity of nesting species, thanks to the variety of habitat types near one another.

Offshore, and sometimes on the beach or in tidal pools, a variety of crustaceans are sometimes seen. Crabs include green, blue, hermit, spider, fiddler and sand. Many of these are being displaced by the Japanese shore crab. The horseshoe crab, actually an arthropod, makes its

home around the shore and marshes. Various snails and insects also inhabit the beach and salt marsh. Clams and mussels bury themselves in the mud flat along the Poquonock River.[22]

[22] Bluff Point website: https://www.ct.gov/deep/cwp/view.asp?a=2716&q=417062&deepNav_GID=1650

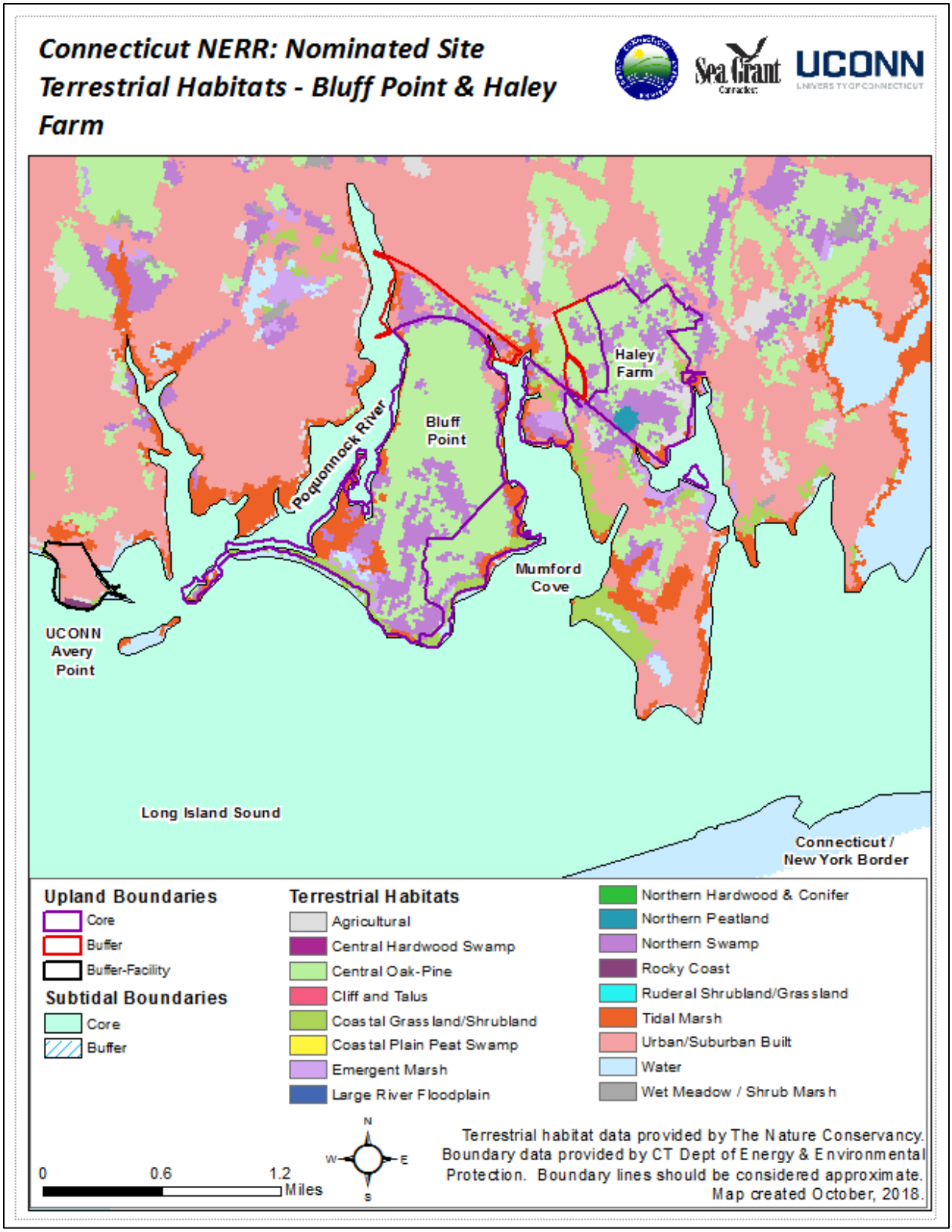

Figure 31: Bluff Point / Haley Farm Terrestrial Habitats. Map created by DEEP.

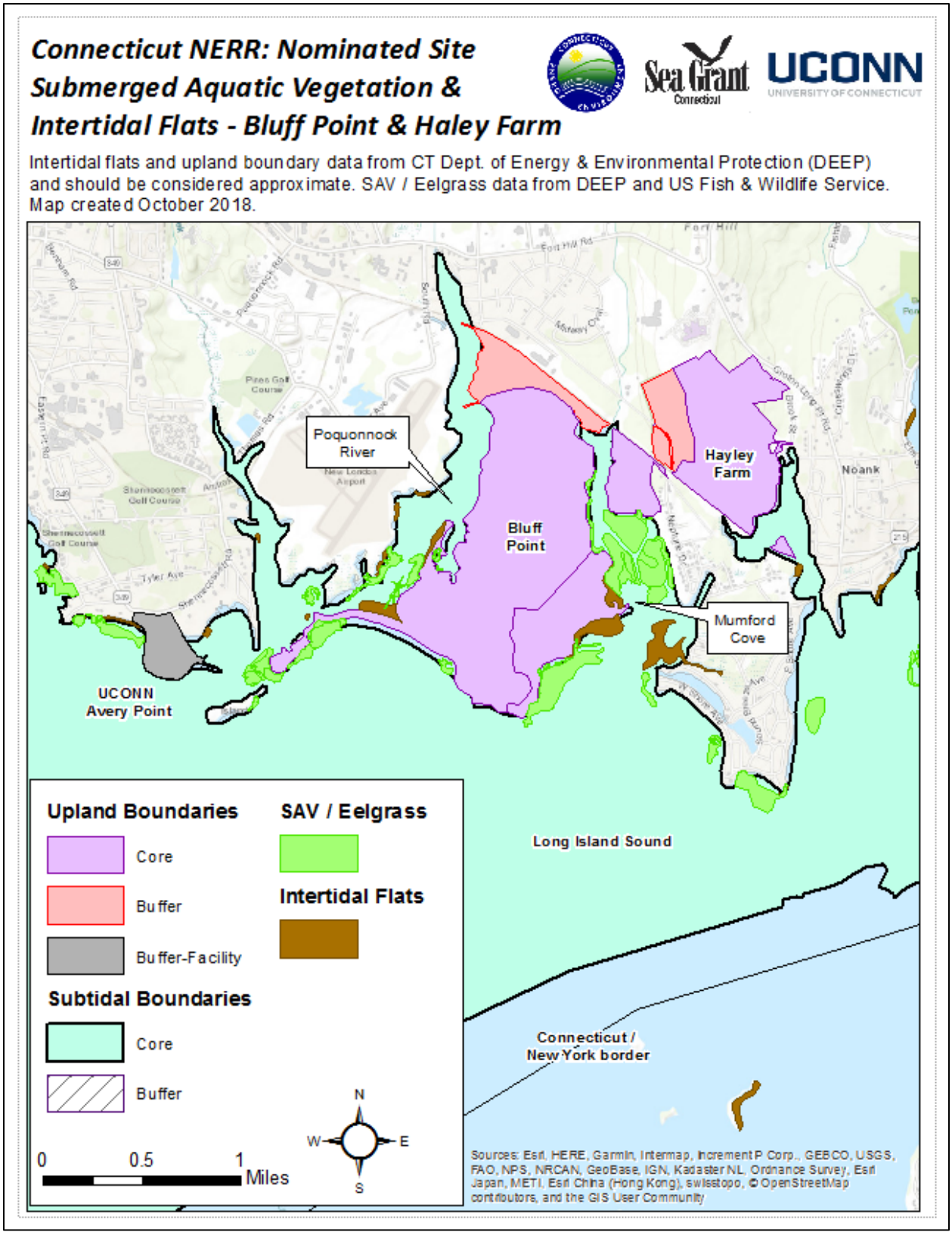

Figure 32: Bluff Point / Haley Farm Intertidal Flats and SAV. Map created by DEEP.

Lord Cove and Great Island Wildlife Management Areas:[23] The Great Island WMA consists of an extensive system of salt and brackish meadow marshes. As is typical of most saltmarshes along the shoreline of Long Island Sound, the dominant vegetation zone is high-marsh consisting of a mosaic characterized by black-grass, salt-meadow cord-grass, and spike grass. Other plant associates include seaside goldenrod, perennial salt marsh aster, saltmarsh aster, and spearscale. Pannes (shallow depressions) are common and contain glasswort, stunted smooth cordgrass, sea lavender, seaside plantain, sea lite, and arrow grass. A narrow band of low-marsh, characterized by monocultures of smooth cordgrass, exists at the waterward edge of the marsh as well as creeks and ditches. Within the high brackish meadow marshes, the dominant plant types include salt-meadow cordgrass and black grass, similar to the high saltmarshes. However, seaside goldenrod and arrow-grass are more abundant and saltwort and sea lavender are less abundant than in saltmarshes. As soil salinity decreases, bentgrass, and spike rushes dominate with straw sedges, red fescue, mock bishop-reed, New York aster, salt marsh fleabane, and silverweed are present as well. A distinctive community type of several species of bulrushes and threesquare sedges can also be found within brackish marshes. These colony forming species may cover several acres and consist of common threesquare and Olney threesquare sedges, plus short bayonet grass, tall saltmarsh bulrush, and robust bulrush. Low marsh zones within brackish marshes are also dominated by smooth cordgrass, but in contrast to the low saltmarsh zone, there is often a distinct understory present commonly comprised of dwarf spike rush and/or the diminutive umbellifer lilaeopsis.

[23] RAMSAR nomination report: https://nctc.fws.gov/resources/knowledge-resources/pubs5/ramsar/begin.htm

Figure 33: Great Island, as seen looking west from the Lieutenant River Boat launch in Old Lyme. Photo credit: DEEP.

Lord Cove WMA consists of an extensive area of brackish reed marsh and floodplain forest, In the high-marsh zone, the dominant species is the narrow–leaved cattail, which can reach an average height of 5 feet and form monospecific colonies. Other colonizing reeds include robust bulrush, common threesquare, common reed, and rose mallow. Although reeds dominate here, pockets of brackish meadow vegetation can also occur. In low-marsh zones, smooth cordgrass is the principle species.

Figure 34: View of Lord Cove marshes, looking west towards the Connecticut River. Photo credit: DEEP.

Both Great Island and Lord Cove are proximal to intertidal flats, which can support dwarf spike-rush, lilaeopsis, tidal arrow-head, and mudwort. The subtidal waters of the Connecticut River that span these two properties support an assortment of submerged aquatic vegetation with horned pondweed, wild celery, widgeon grass, water-milfoil, and canadian pond weed as the primary species.[24]

The Lord Cove and Great Island Wildlife Management Area marshes are critical habitats for a variety of animals, such as the bald eagle, osprey, black rail, northern harrier, American bittern, and northern diamond-back terrapin. The area is particularly important as both a movement corridor and migratory stopover for numerous avian species, especially waterfowl, and in particular, American Black duck. Here, the river and marshes open-water wintering habitat when may inland areas are frozen over. The riverine waters and tidal flats are important finfish

[24] Barrett et al "Distribution and Abundance of Submerged Aquatic Vegetation in the Lower Tidal Connecticut River." Connecticut Department of Environmental Protection report. 1997.

and shellfish areas especially for Atlantic and shortnose sturgeon, Atlantic salmon, American shad, blueback herring, American oyster and soft-shelled clam.

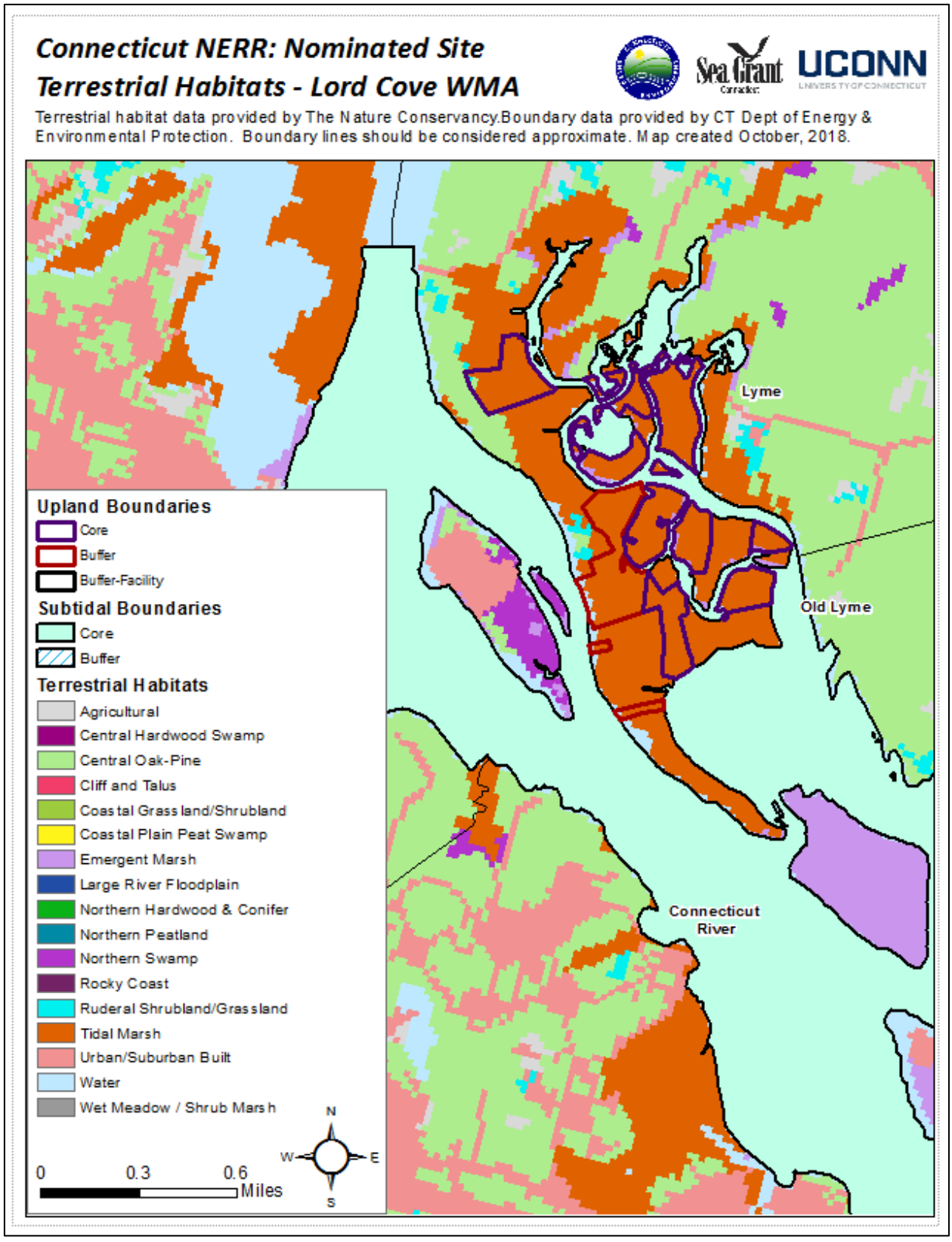

Figure 35: Lord Cove Terrestrial Habitats. Map created by DEEP.

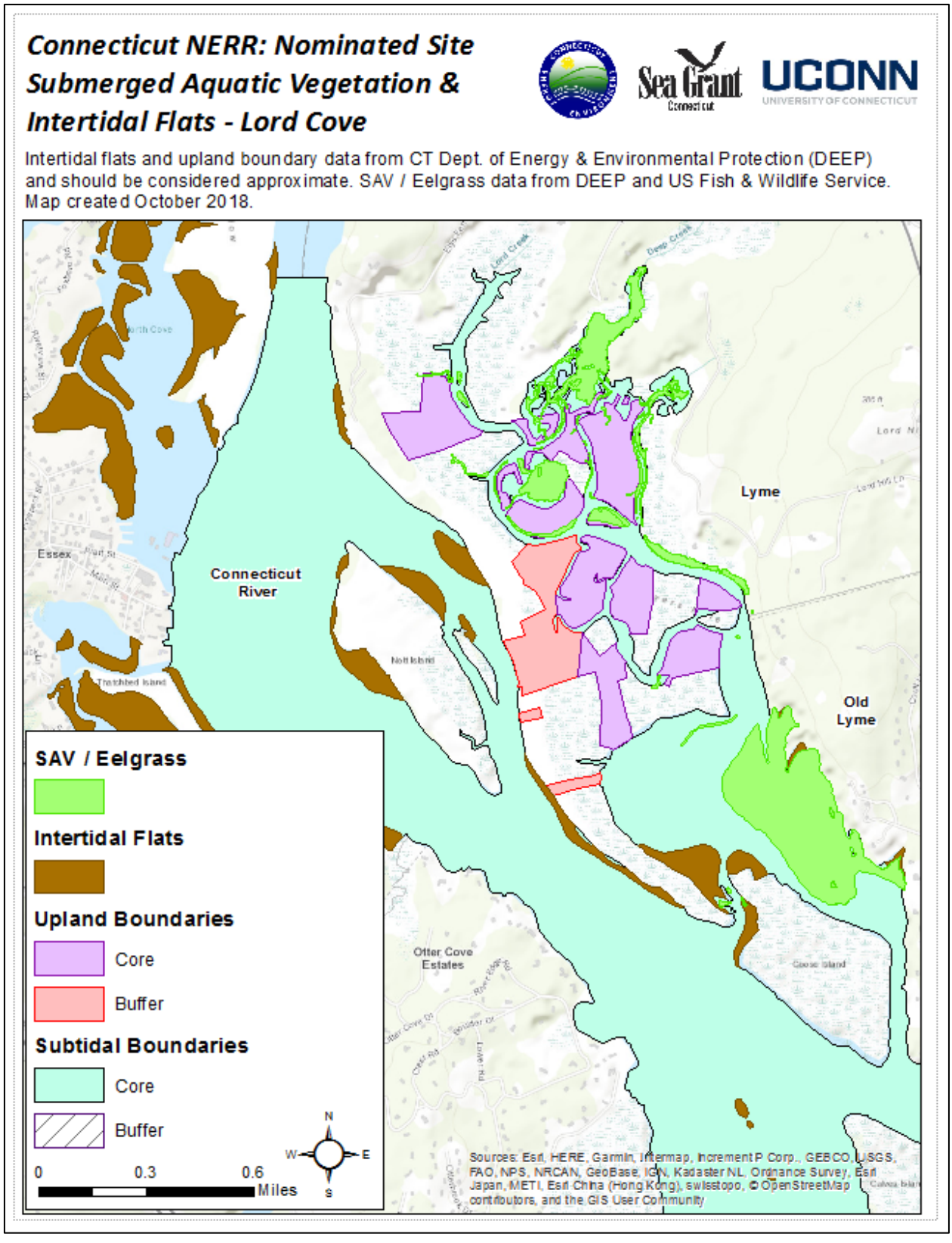

Figure 36: Lord Cove Intertidal Flats and SAV. Map created by DEEP.

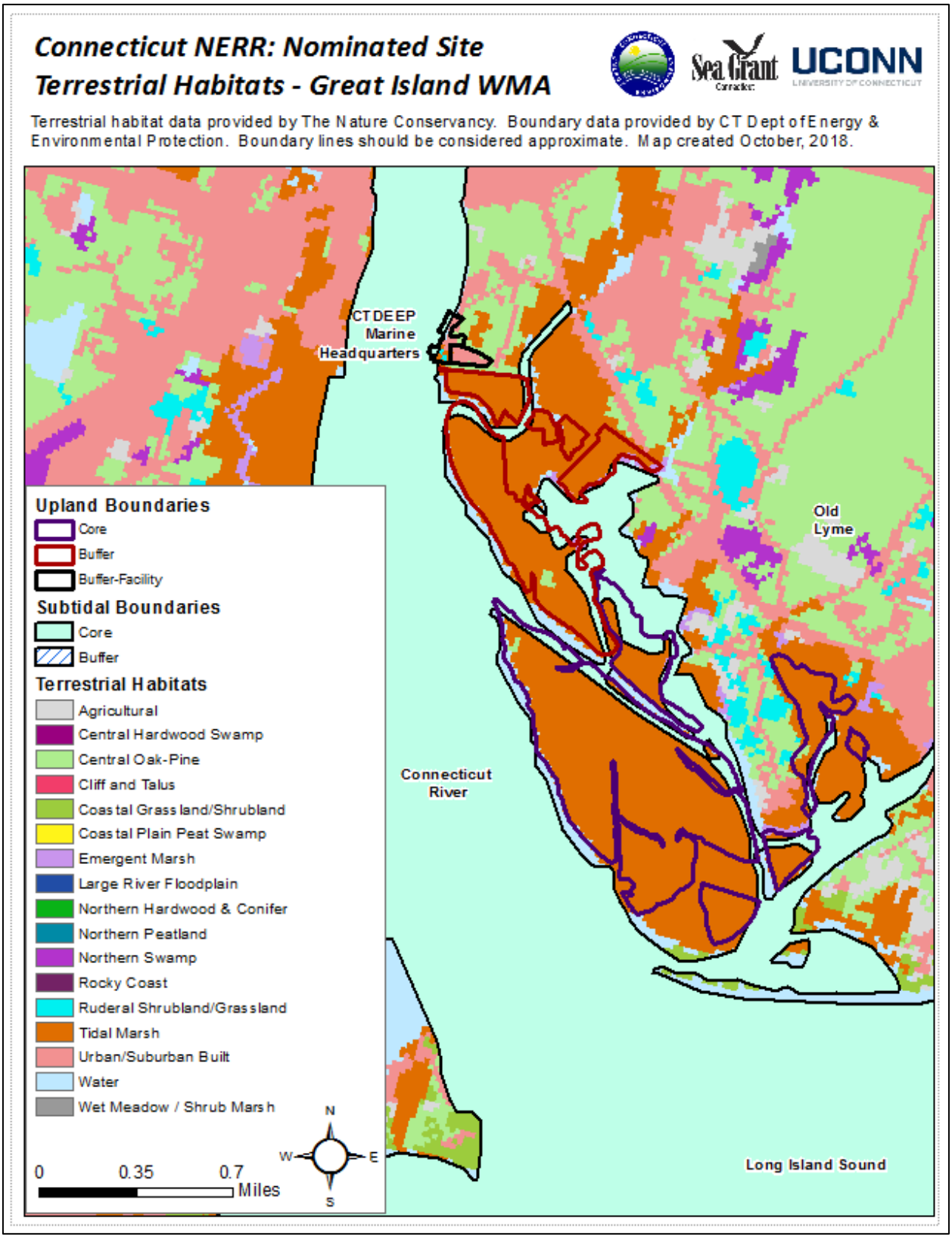

Figure 37: Great Island Terrestrial Habitats. Map created by DEEP.

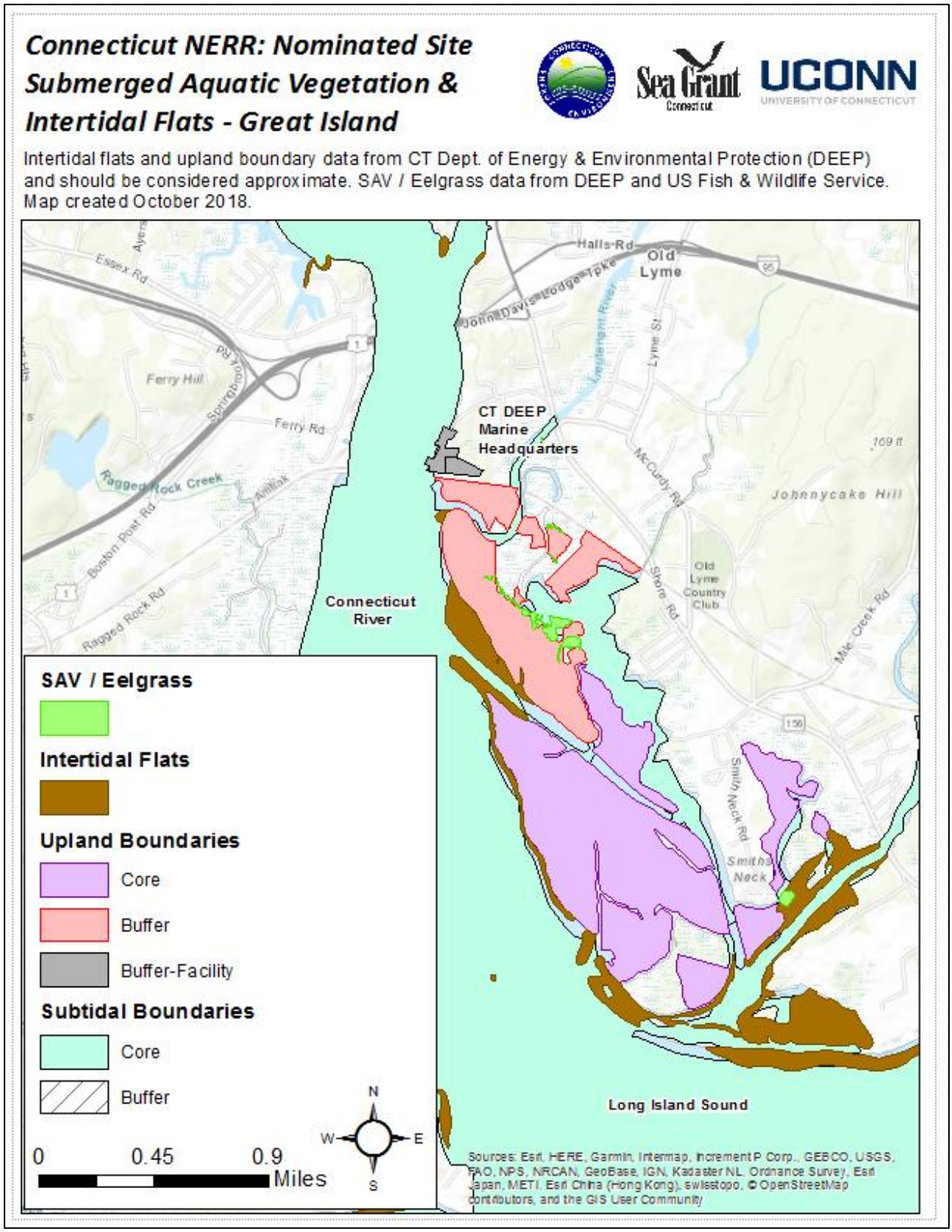

Figure 38: Great Island Intertidal Flats and SAV. Map created by DEEP.

Offshore:[25] The offshore areas of the Nominated Reserve are an array of submerged aquatic vegetation, soft-bottom, and hard-bottom, which span a depth regime from 1 to over 150 feet in depth. Seagrasses and seaweeds are often the dominant structure-forming organisms in the near-shore shallow waters. Like terrestrial grasses and trees, these are primary producers, providing dissolved oxygen, food, and shelter for organisms living within the habitat. Dense seagrass meadows provide refuge from predators and tidal currents.

Figure 39: Submerged aquatic vegetation – Eelgrass.

Softbottom (Sandy and silt/mud/clay) dominated habitats are perhaps the most prevalent and perhaps least complex of the range of subtidal habitats in the Nominated Reserve, but are nevertheless critical as many burrowing species adapt to life in these habitats. Tidal and storm currents form sand waves and sand ripples, which like rocks and fauna in more spatially-complex habitats, provide refuge from current flows. The cohesive nature of fine silt and clay

[25] Text and photos from Explore LIS: http://www.lisrc.uconn.edu/explorelis/index.htm. Photo credits for Figures 39-44: Peter J. Auster, Robert E. DeGoursey, Robert Bachand, Edward Parry, and Eric Heupel.

sediments as well as an abundance of nutrient-rich material provide an optimal habitat for many infaunal and epifaunal invertebrates

Figure 40: A juvenile striped cusk eel digs into the sand tail first and comes out at night to forage for prey.

Figure 41: A sand shrimp burrows into the mud in search of prey and shelter. Trails from snails surround the shrimp.

Boulder and gravel areas are the most spatially complex habitats. These areas range in structure from large piles of boulders to flat pavements of small cobbles and pebbles. The relative stability of rock substrates provides a home for many encrusting and mobile organisms, and the crevices between and under boulders provide cover from predators and refuge from swift currents. Several examples of cold-water corals have been observed.

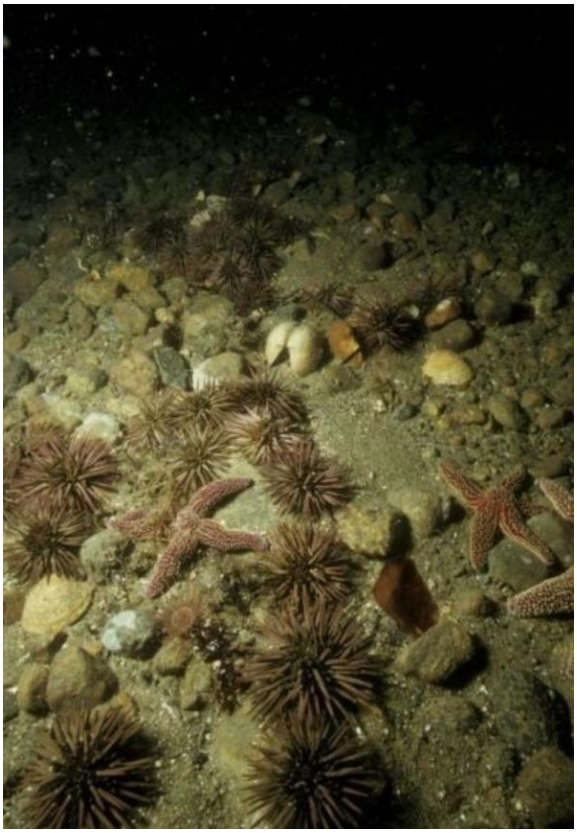

Figure 42: Purple sea urchins and sea stars on cobble covered seafloor.

Figure 43: Blue mussels and barnacles compete for space on hard rock substrates.

The offshore area serves as nursery area for nearly 3 dozen species of fish; a migration area for 8 diadromous fish species, and concentration area for 8 fish species. Invertebrates such as the horseshow crab, American lobster, and eastern oyster use this as nursery and spawning areas, and marine mammals such as seals, porpoises, dolphins, and humpback whales have been overserved transiting though. The large degree of benthic diversity – spanning biologic, geologic, and depth classifications - allows for a wide range of sizes and types of organisms able to utilize such habitats.

Figure 44: In Long Island Sound, Atlantic salmon migrate through estuaries to the inland rivers and streams for spawning.

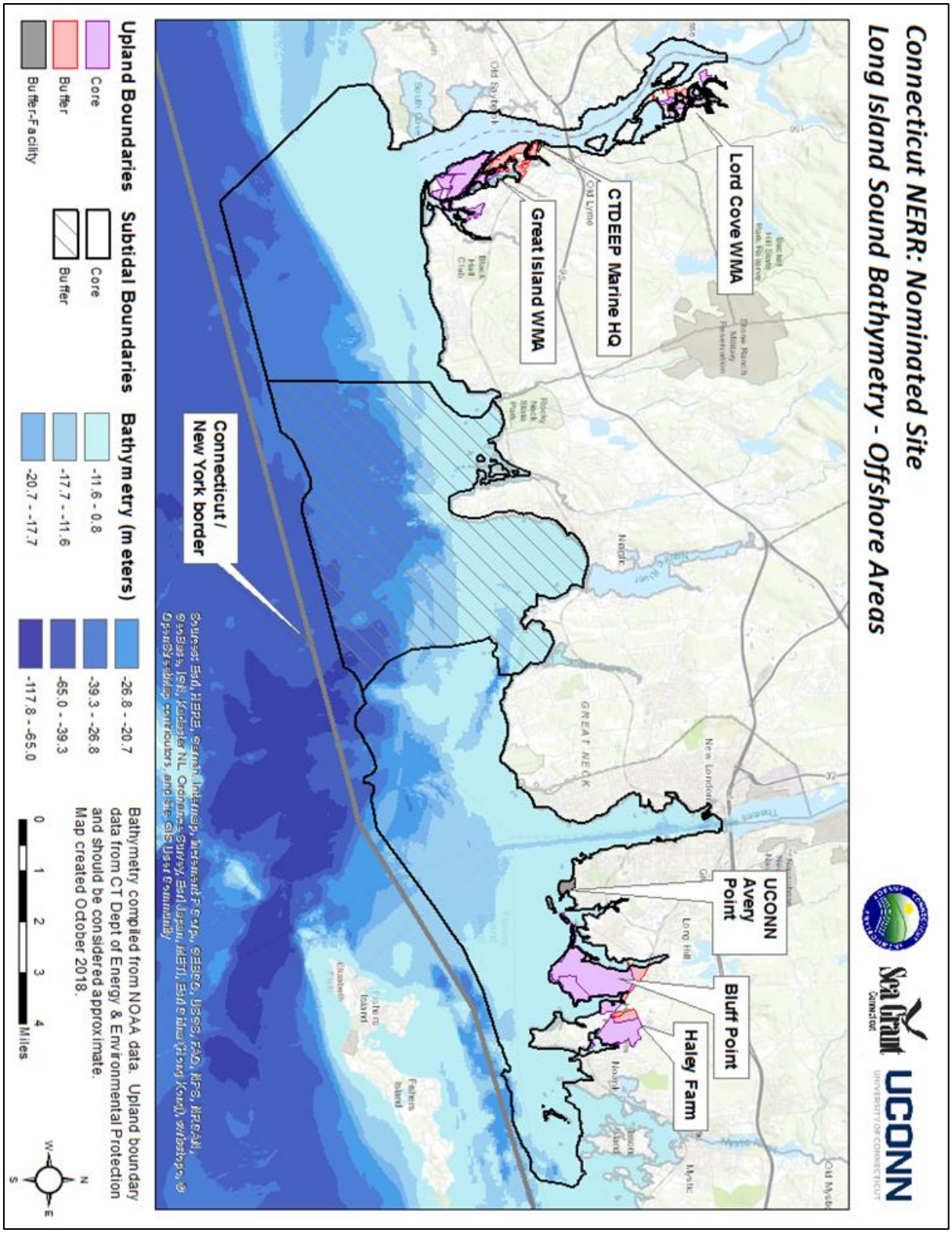

Figure 45: Offshore bathymetry. Map created by DEEP.

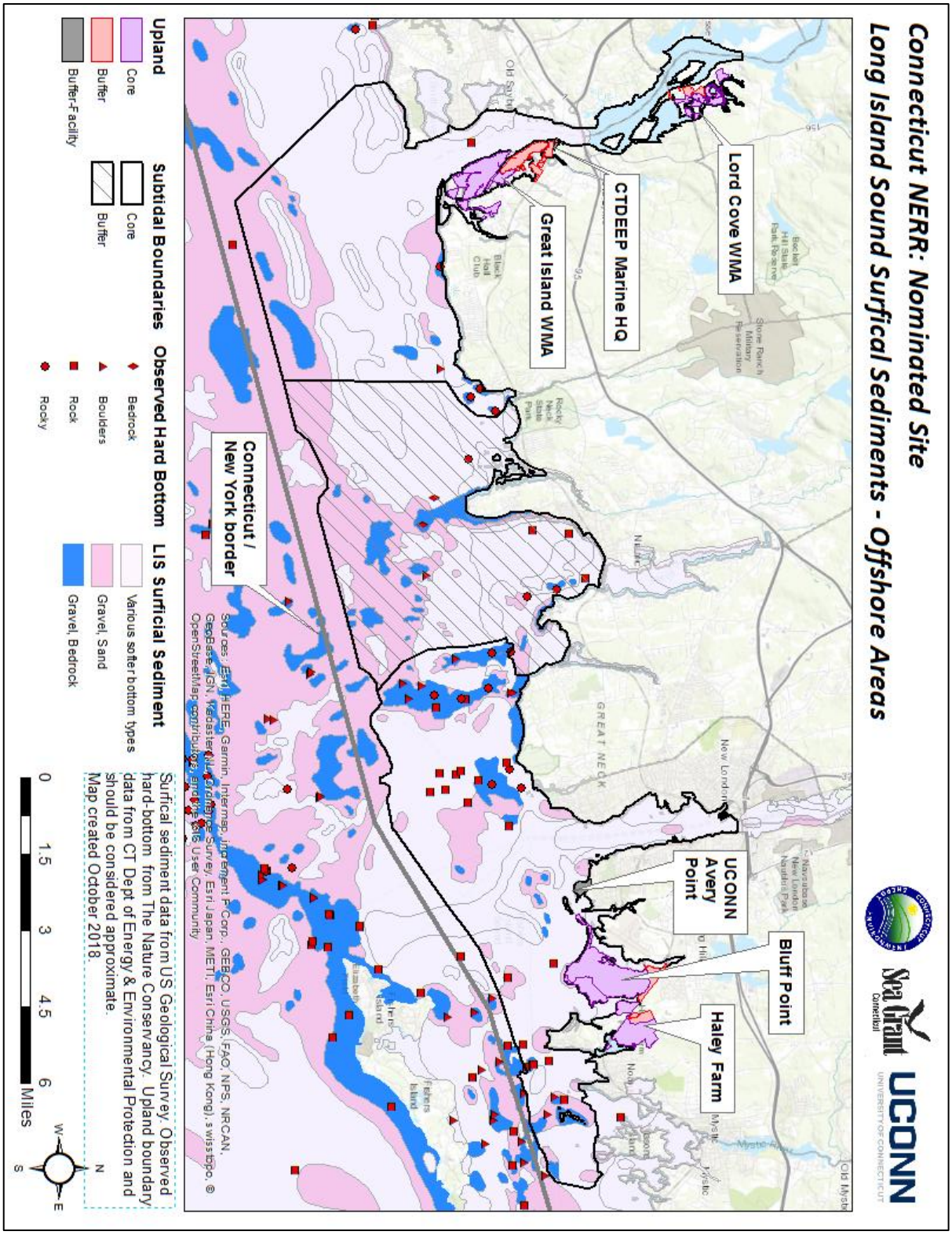

Figure 46: Offshore surficial sediments and hard-bottom locations. Map created by DEEP.

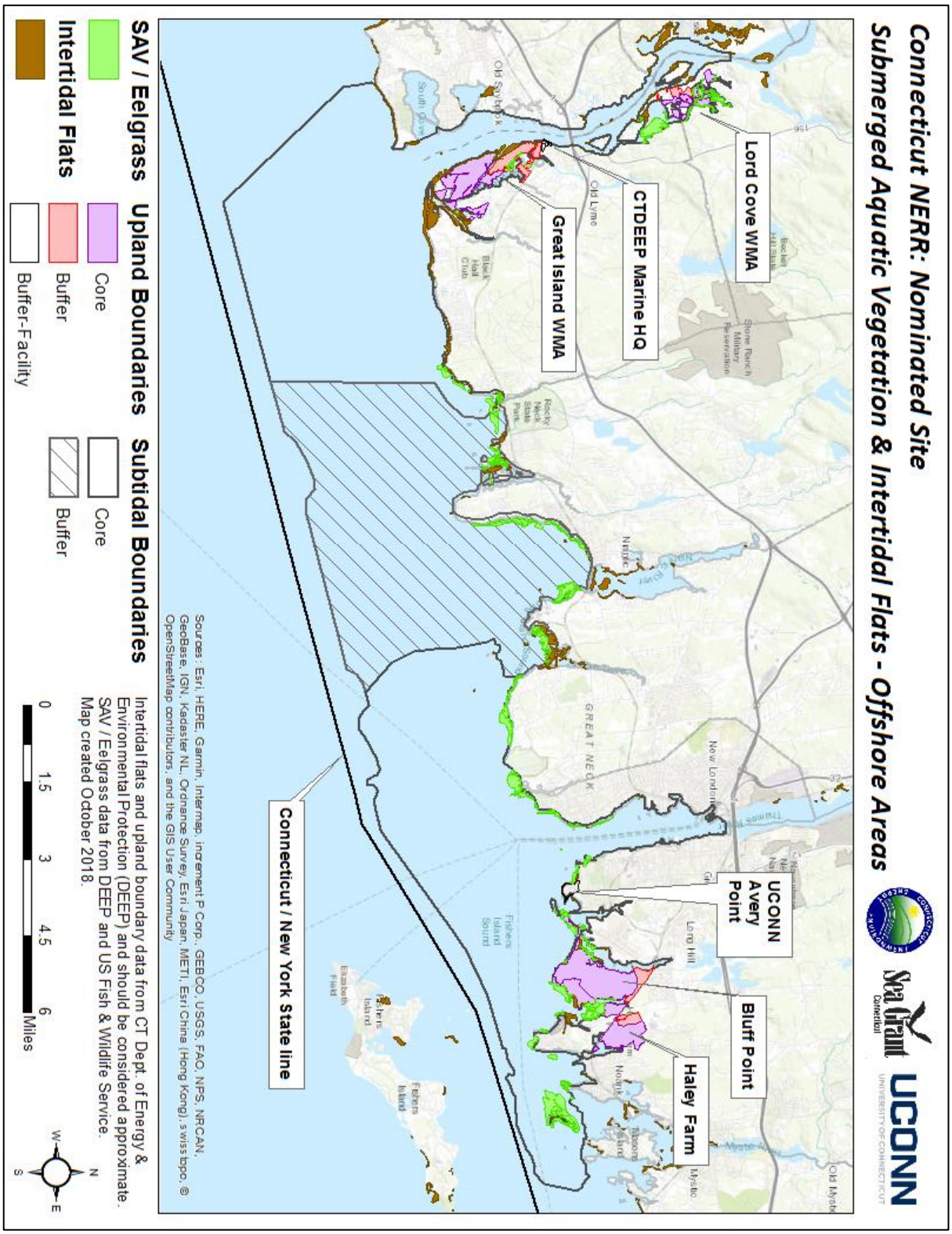

Figure 47: Offshore intertidal flats and SAV. Map created by DEEP.

Significant Flora and Fauna

The upland and offshore areas of the Nominated Reserve, owing to the overall size and the range of habitats include, numerous occurrences of significant species. A brief summary is provided below, and more comprehensive listings can be found in Appendix 8.

Haley Farm: Five plant, three bird and one invertebrate species. All but two of these are listed as either endangered, threatened, or species of concern by Connecticut, and four are listed as species of Greatest Conservation Need (GCN).

Bluff Point: 13 plant, nine bird, 11 invertebrate, and one terrestrial mammal species. All but six are listed as either endangered, threatened, or species of concern by Connecticut. 14 are listed as GCN species, and two are listed as International Union for Conservation of Nature (IUCN) species.

Lord Cove: Nine plant, nine bird, and one reptile/amphibian species. All are listed as either endangered, threatened, or species of concern by Connecticut, 10 are listed as GCN species, and one is listed as IUCN species.

Great Island: Seven plant, 15 bird, and one invertebrate species. All are listed as either endangered, threatened, or species of concern by Connecticut. All but nine of these are listed as GCN, and two are listed as IUCN species.

Offshore[26]:

- Fish: nursery area for nearly three dozen species of fish; migration area for eight diadromous fish species; concentration area for eight fish species; Includes vulnerable occurrences of Atlantic and short nosed sturgeon.
- Invertebrates: nursery area for horseshoe crab, American lobster; spawning area for horseshoe crab; concentration area of eastern oyster.

[26] 2016 NOAA ESI data: https://response.restoration.noaa.gov/maps-and-spatial-data/download-esi-maps-and-gis-data.html

CONFORMITY OF PROPOSED SITE WITH NERR PROGRAM GUIDING PRINCIPLES

Throughout the site selection process consideration was given to how each of the candidate sites would conform to the guiding principles for the NERR program, as described in 15 CFR 921.11(c) (Appendix 29). Many of these considerations are reflected in the site selection criteria developed for this effort, and the established process used was reviewed by leadership within the Stewardship Division of NOAA's Office for Coastal Management. The following summaries, however, serve to highlight how the final candidate site conforms to these guiding principles and, therefore, ultimately contributes to the national system.

Site's Contribution to the Biogeographical and Typological Balance of the NERR

The Nominated Reserve is located in a biogeographic region that includes several neighboring reserves - the Hudson River in New York, Narragansett Bay in Rhode Island, and Waquoit Bay in Massachusetts. Many of associated typologies the Nominated Reserve contains – predominantly saltmarsh, tidal rivers, and sub-tidal softbottom sediments - complement those found in regional neighbors. The SST was cognizant, however, that any nominee also needed to bring either unique or exemplary typologies to the region. As a result, Nominated Reserve brings several key characteristics to the Reserve system that existing reserves do not, specifically:

- Subtidal areas of varying bottom type ranging from soft-bottom silt/clays to hard-bottom (reefs, bedrock/gravel zones, rocky/boulder areas) that span depth envelopes of 0 to >150 feet Mean Lower-Low Water.) Combining these bottom types, particularly the hard-bottom, with a significant range of depth classes (both of which are atypical in neighboring Reserves) brings a fundamentally new suite of habitat types to the Northeast biogeographic region.
- Shoreland and Transition Areas include an example of habitat types that to our knowledge do not exist, or exist in a very limited fashion, in the region:
    - A Mesic cove forest found on sheltered coves and concave slopes within the Bluff Point property. Soils are often rocky and may be coarse or fine-textured, and may be residual, alluvial, or colluvial. Single tree gap-phase regeneration drives forest stand dynamics.
- Further, the Connecticut River area of the site includes several noteworthy characteristics:

- Salinity ranges in the Connecticut River occur at levels that exceed the Hudson River
- Circulation characteristics based on freshwater and mixing parameters make the Connecticut River distinct from the Hudson River.[27]
- Exemplary brackish tidal wetlands (recognized as such by their designation as wetlands of international importance by the RAMSAR convention.)

Site's Ecological Characteristics and Degree of Human Influence

The Nominated Reserve contains ecological characteristic of local, regional, and global significance.

Bluff Point State Park lies between a railway line and an abandoned railroad spur, and railroad related activities in the 19th century altered much of the natural resources in this area. Despite this, Bluff Point is the last remaining significant piece of undeveloped land along the Connecticut coastline. The natural habitats found here include coastal woodlands, beach and dune grasslands, coastal plain ponds, coastal bluff, tidal wetlands, intertidal mud flats and offshore eelgrass beds. Because of this unique combination of habitats, a variety of plants and animals live in the area. Some of these are rare or endangered. The coastal reserve component of Bluff Point State Park was established by the Connecticut legislature in 1975 with the purpose of preserving "native ecological associations, unique floral and faunal characteristics, geological features and scenic qualities in a condition pf undisturbed integrity." A portion of the coastal reserve was further given the designation of a natural area preserve, which sets aside *natural areas* (an area of land or water containing, or potentially containing, plant or animal life or features of biological, scientific, educational, geological, paleontological, or scenic value) to support *protected resources* (particular conditions, vegetation or natural features within a natural area preserve, including, but not limited to, any species of plant or wildlife, which require protection and preservation in order to continue and flourish.)[28]

Haley Farm State Park and the State Park component of Bluff Point, are slightly less diverse in ecological habitats, but nevertheless provide tidal and freshwater wetlands, coastal forest

[27] Geyer, W. Rockwell and MacCready, Parker. The Estuarine Circulation. Annual Review of Fluid Mechanics. Vol 46., March, 2014. pp 175-97.
[28] Natural Resources Inventory of and Management Recommendations for Bluff Point Coastal Reserve and State Park, Groton, CT. Unpublished Connecticut Department of Environmental Protection report.

stands, and coastal grasslands that function as refuge and breeding areas for a variety of fish, amphibian, and avian species.[29]

The DEEP Wildlife Management Areas of Lord Cove and Great Island in the lower Connecticut River offer several unique aspects worth noting within this context. The Connecticut River is the only principal river in the northeastern United States without a major port, harbor, or urban area at its mouth. This is the result of shifting sandbars in Long Island Sound which impede navigation. This situation has served to preserve the largely rural character of the regional landscape and maintain the River's extraordinary assemblage of natural and relatively undisturbed biotic communities. The waters and marshes provide essential habitat for several federally listed and candidate species, globally rare species, and dozens of state rare and endangered species. From a regional standpoint, there are no other areas in the Northeast that support such extensive or high quality fresh and brackish tidal wetland systems as do those in the Connecticut River – a key factor in their designation by the RAMASAR Convention as "Wetlands of International Importance."[30]

The offshore areas of the Nominated Reserve include a variety of ecological characteristics: submerged aquatic vegetation, soft-bottom, and hard-bottom, which span a depth regime from 1 to over 150 feet in depth. Sand dominated habitats are perhaps the most prevalent but boulder and gravel areas form spatially complex and significant habitats. Several examples of cold-water corals have been observed. In additional to being a migratory corridor for any number fish and marine mammals, sections of the offshore area serve as concentration, nursery, and spawning areas. The large degree of benthic diversity – spanning an assortment of biologic, geologic, and depth classifications - enables a wide range of sizes and types of organisms to utilize such habitats.[31]

Although these land and water areas support numerous ecological services, they also share space with a significant amount of human uses.

Current land-based and shore-centric human-use activities within the site boundaries vary and can range from hiking, biking, swimming, pleasure boating/kayaking, diving, recreational fishing/shellfishing, and seasonally managed hunting to large scale commercial and industrial

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[29] Haley Farm website: https://www.ct.gov/deep/cwp/view.asp?a=2716&q=325208&deepNav_GID=1650
[30] RAMSAR nomination report: https://nctc.fws.gov/resources/knowledge-resources/pubs5/ramsar/begin.htm
[31] Explore Long Island Sound website: http://www.lisrc.uconn.edu/explorelis/index.htm

water-dependent uses (most of which are centralized in the lower Thames River area and reflect its location as a center of maritime focus.) Historically, the marshes of the lower Connecticut River (as is typical of many tidal wetlands across the state) were ditched in the early part of the 20th century as part of mosquito control techniques. During the mid-1980s, restoration programs sought to cease this activity in favor of more ecologically sound techniques that encouraged the restoration of pre-ditching hydrology.[32] At Haley Farm, a former working farm dating back to the Colonial era, remnants of numerous stone walls dot the landscape as do the foundations of various farm buildings lost to time.

The off-shore area of the Nominated Reserve site in general is densely used by recreational and commercial boating, owing largely to the port facilities in Thames River, numerous marinas and yacht clubs, and close proximity to the North Shore of Long Island, Fisher's Island, and the open waters of the Atlantic Ocean. There are commercial aquaculture and kelp farming operations within the Nominated Reserve offshore boundaries, mostly concentrated in and around the Groton area, and past and current dredged material disposal sites are also included. The Thames River area includes a U.S. Coast Guard Station, and a U.S. Naval submarine base and shipyard is located outside and to the north of the offshore boundary. As such, submarines and surface vessels transit regularly through the waters of the site to other parts of LIS and the Atlantic.

While some areas within the Nominated Reserve have been influenced by humans uses and can be expected to continue in the future, many of the valuable habitats and their functions have been recognized, designated, and managed in such a way to help maintain their integrity and preservation. NOTE: Please refer the subsequent section on Adjacent Land and Water Uses for a discussion on how neighboring areas and their impacts.

Site Selection Team Scoring Notes:

The results of the selection process serve to confirm that the Nominated Reserve presents a high level of ecological significance and value. Overall, looking at the scores for the 11 criteria that assessed Environmental Characteristics, the proposed site received the highest score:

ELIS: 2.42	CTRiver: 2.45	CLIS: 2.10	WLIS: 2.21	**Hybrid: 2.55**

[32] Dryer and Niering. Bulletin 34 – Tidal Marshes of Long Island Sound – Ecology, History, and Restoration. Connecticut College Arboretum. 1995.

Further, when considering the overall recommended scores by the sub-team that evaluated and reported on these criteria, 93% of the scores provided on an individual basis concurred. Of the 7% where individual criteria scores varied form the recommendations, most were concentrated between 2 reviewers, where scores tended to be slightly lower.

Adequacy of Site's Boundaries and Control Over Human Activities

Because all of the components of the Nominated Reserve are already under public ownership or held in public trust by the State of Connecticut, the site as a whole is expected to continue to maintain adequate control to balance the resource conservation/management with human activities. Since the upland properties have been designated and are currently managed to support various forms of conservation and public recreation uses, their essential functions from a NERR perspective would not change. Existing state and local rules and regulations governing a wide range of both land and off-shore activities and uses already offer a level of control that can be considered consistent with the mission and objectives of the NERR; for example, a wide variety of research, education, training, and stewardship activities spanning various groups and time frames have successfully occurred while in conjunction with various human uses of active/passive recreation, fishing/shellfishing, boating, etc.

Site Selection Team Scoring Notes:

Overall, the selection team felt that the Nominated Reserve's characteristics in relation to management concerns were superior to the other sites. Looking at the scores for each of the nine criteria that assessed Management Characteristics, the proposed site received the highest score:

ELIS: 2.46	CT River: 2.55	CLIS: 2.29	WLIS: 1.81	**Hybrid: 2.60**

Further, when considering the overall recommended scores by the sub-team that evaluated and reported on these criteria, 90% of the scores provided on an individual basis concurred. Of the 10% where individual criteria scores varied form the recommendations, most were concentrated between 2 reviewers, with scores that were split nearly evenly with higher and lower values. The team noted that while many diverse and important recreational and commercial uses occur within the site boundaries, the designation of a Reserve is not likely to impede these. Current uplands are already managed in such a way to leverage resource and habitat protection with

various active and passive human uses, and the additional of any research, monitoring, or educational programming could similarly be managed. While the off-shore area is much more expansive and hosts a wide variety recreational as well as commercial activity there are no anticipated impacts from Reserve programs that would impede or limit these. Rather, there are potential avenues where human uses and reserve activities may be mutually beneficial

Site's Suitability for Long-Term Estuarine Research

The Nominated Reserve offers excellent opportunities for long-term research. Taken as a whole, the site contains a mosaic of upland, transitional and subtidal habitats situated proximal to a variety of coastal uses including developed waterfronts at the mouth of the Thames River, significant recreational/commercial boating and fishing, as well as shellfishing and aquaculture to name a few. This combination of resources and uses is reflected in a broad examination of research activities found in the both peer-reviewed and grey literature conducted to support the NERR Site Selection process. This meta-analysis identified close to 200 papers or projects on topics ranging from tidal wetland restoration, vegetative assessments, species predation patterns, population dynamics, invasive species identification and control, climate change, water quality impacts, nutrient loading effects, etc. The offshore areas of Long Island Sound have supported long term research and monitoring efforts for physically oceanography, water quality, benthic habitats, and fisheries assessments. The location of the UCONN-Avery Point Marine Science campus in close proximity (minutes from Bluff Point by car or boat, and not much further to the Lower Connecticut River) provide world-class facilities and resources. As such, there are multiple opportunities for important research regarding estuary habitat dynamics, long-term ecosystem monitoring and trend analyses, as well as emergent areas of climate change, aquaculture best practices, etc. These investigations and their relationships to helping address and inform key coastal management issues are indicative of the suitability of the Nominated Reserve. The site also creates valuable opportunities for comparative research with other nearby estuary systems both within the Reserve system (e.g., Narragansett Bay,) and without (e.g., numerous scientific and citizen science groups working in other areas of the Connecticut coast.) The existing research institutions, organizations, research efforts, institutional collaborations, and partnerships offer a tremendous opportunity to further leverage resources, partnerships, and expertise in a synergistic manner.

Site Selection Team Scoring Notes:

Overall, the selection team felt that the Nominated Reserve's characteristics for supporting long term research and monitoring were substantial, though it did not receive the highest score among the group. It did however finish third overall, and within a top tier including the ELIS and WLIS sites based on the scoring distribution below. This result is not surprising, considering how the configuration of the site components were constructed. The lower Connecticut River properties were part of one of the lower overall scoring sites (Connecticut River) and by excluding the Barn Island WMA property (that was originally included in the ELIS site) the loss of a significant area of long-term tidal and estuarine research becomes apparent. The site scores for the five criteria that assessed Long term Research and Monitoring Characteristics were:

ELIS: 2.77	CT River: 2.49	CLIS: 2.37	WLIS: 2.74	Hybrid: 2.67

Further, when considering the overall recommended scores by the sub-team that evaluated and reported on these criteria, 91% of the scores provided on an individual basis concurred. Of the 9% where individual criteria scores varied form the recommendations, the scores reasonably well-distributed and not obviously concentrated to any specific reviewer(s). The variations of scores above and below the recommendations were also fairly evenly split.

Site's Importance to Education and Interpretation

The Nominated Reserve provides many opportunities for education and interpretation, including opportunities that will integrate research and stewardship activities affecting Long Island Sound's estuaries and their watersheds. As mentioned previously, the area has a variety of habitat types including the last remaining significant piece of undeveloped land along the Connecticut coastline, and what is believed to be the largest expanse of tidal marshes that are adjacent to undeveloped upland habitat anywhere along the US east coast from New York City to Maine. The area is attractive for short and long-term educational opportunities as it continues to demonstrate a presence of multiple uses, and has existing and potential opportunities with local resources including but not limited to the Mystic Aquarium, Mystic Seaport Museum of America and the Sea, the Connecticut River Museum, the Roger Tory Petersen Estuary Center, Project Oceanology, and several active land trusts and watershed organizations. It is also within close proximity to public and private schools that provide an estimated audience of ~12,500 K-12 students and teachers. Adding the UCONN-Avery Point Marine Science Program

and Connecticut Sea Grant (both formal project partner) plus additional institutions of higher learning (e.g., Connecticut College, Mitchell College, the US Coast Guard Academy, and Three Rivers Community College) provide a substantial audience of additional undergraduate and graduate students. The area has a history of education and interpretation (both Bluff Point and the Connecticut River marshes are regular locations for school field trips and formal and informal nature programs) and has a high potential for future development of education and interpretation programs based on a broad range of topics including ecology, physics/chemistry, geology, biology, archaeology, habitat restoration and coastal resource management. There are multiple areas within the site properties that provide a variety of easy access via vehicle, boat and foot for targeted audiences that would include K-12 students, visitors, community members and local decision makers. Additionally, Haley Farm State Park includes parking access and a trail system which is wheelchair accessible.

Site Selection Team Scoring Notes:

Overall, the selection team felt that the Nominated Reserve's characteristics in relation to Education and Training concerns were superior to the other sites. Overall, looking at the site scores for the four criteria that assessed Management Characteristics the Nominated Reserve received the highest score:

ELIS: 2.23	CT River: 2.41	CLIS: 1.91	WLIS: 2.09	**Hybrid: 2.48**

Interestingly, when considering the overall recommended scores by the sub-team that evaluated and reported on these criteria, *only 81% were in agreement* - the lowest among the criteria groups. However, this was the result of most reviewers feeling that the recommended criteria were too low – in other words the site ought to provide better opportunities than perhaps were assessed. As a result, the disagreeing scores trended higher than those recommended.

COMPATIBILTY WITH EXISTING AND POTENTIAL LAND AND WATER USES

The Nominated Reserve is located in an area of the Connecticut coast that is used in a wide variety of ways. However, it is considered to be compatible with existing and potential land and water uses.

Land Uses

Previous sections have discussed some of the activity-based land uses in the Nominated Reserve and the current management strategies employed to preserve the balance between resource conservation and human uses and thus ensuring compatibility. Here, a look at how land-use in the future might impact the immediate vicinity of upland components is presented. NOTE - Figures 48-50 depict some of the terrestrial habitat in conjunction with recent (2016) aerial photography. Here, the 'developed' and 'water' land cover classes have been removed to better depict the ground features – neighborhoods, commercial/municipal areas, etc.

The upland components of the Nominated Reserve site are situated within two distinct locations in eastern coastal Connecticut. Great Island & Lord Cove Wildlife Management Areas are located along the eastern shores of the mouth of the Connecticut River in the towns of Old Lyme and Lyme, respectively. The populations of the two river towns are relatively small - roughly 2,300 for Lyme and 7,500 for Old Lyme[33]. As noted in the Site Description section, the Connecticut River is the only principal river system in the Northeast that does not have a major port facility or operation at its mouth. While there are several prominent marina facilities on the western side of the Connecticut River in Old Saybrook and a transportation corridor containing Amtrak railway lines and the I-95 interstate within the boundaries, the majority of nearby land is rural in nature, including properties owned by land trusts or similar conservation organizations that are immediately adjacent to portions of both Lord Cove and Great Island. Where nearby and adjacent lands have been developed, they tend to be dominated by neighborhoods and small beach communities.

[33] Connecticut Demographics: https://www.connecticut-demographics.com/cities_by_population

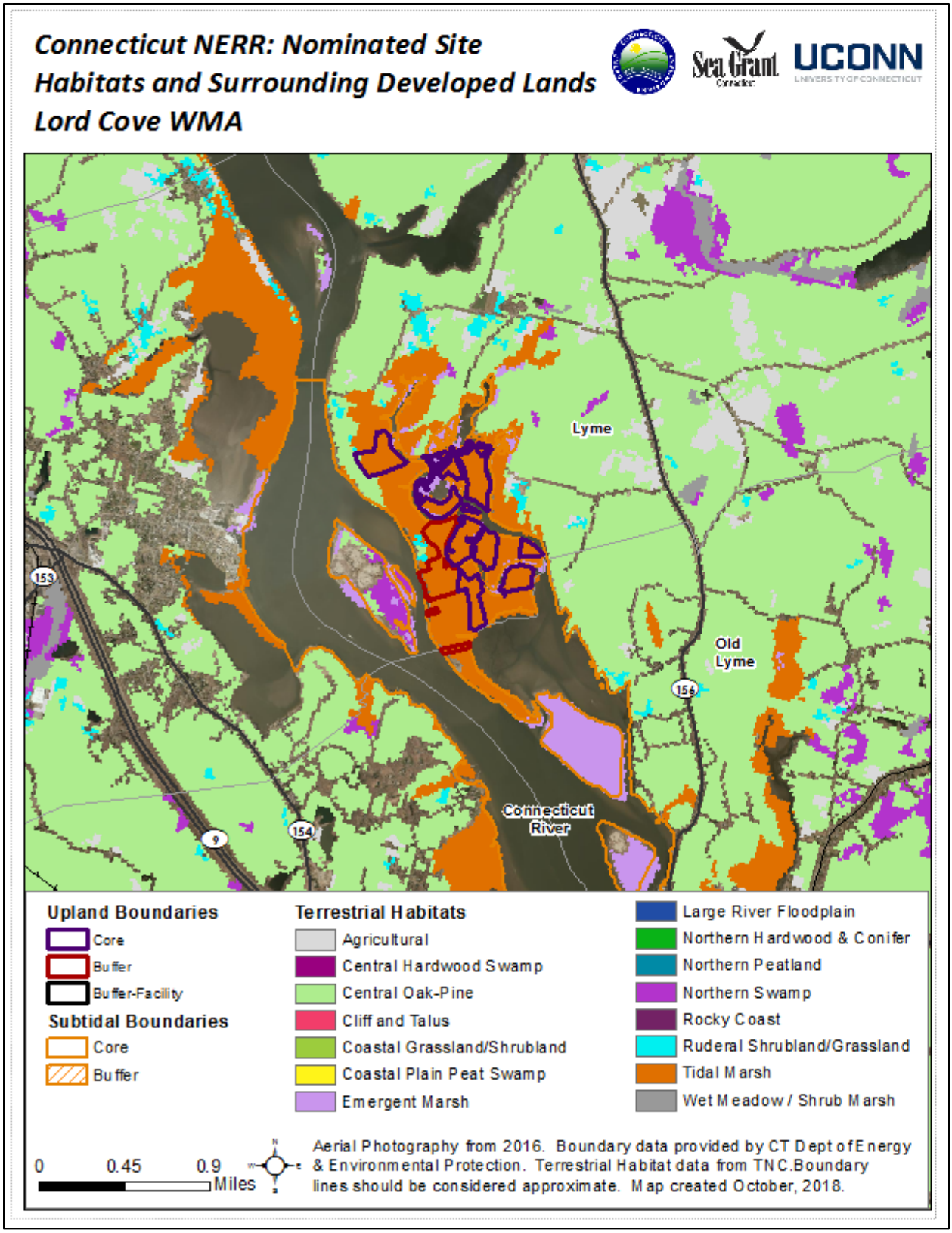

Figure 48: Lord Cove and surrounding landscape. Note the overall lack of developed areas. Map created by DEEP.

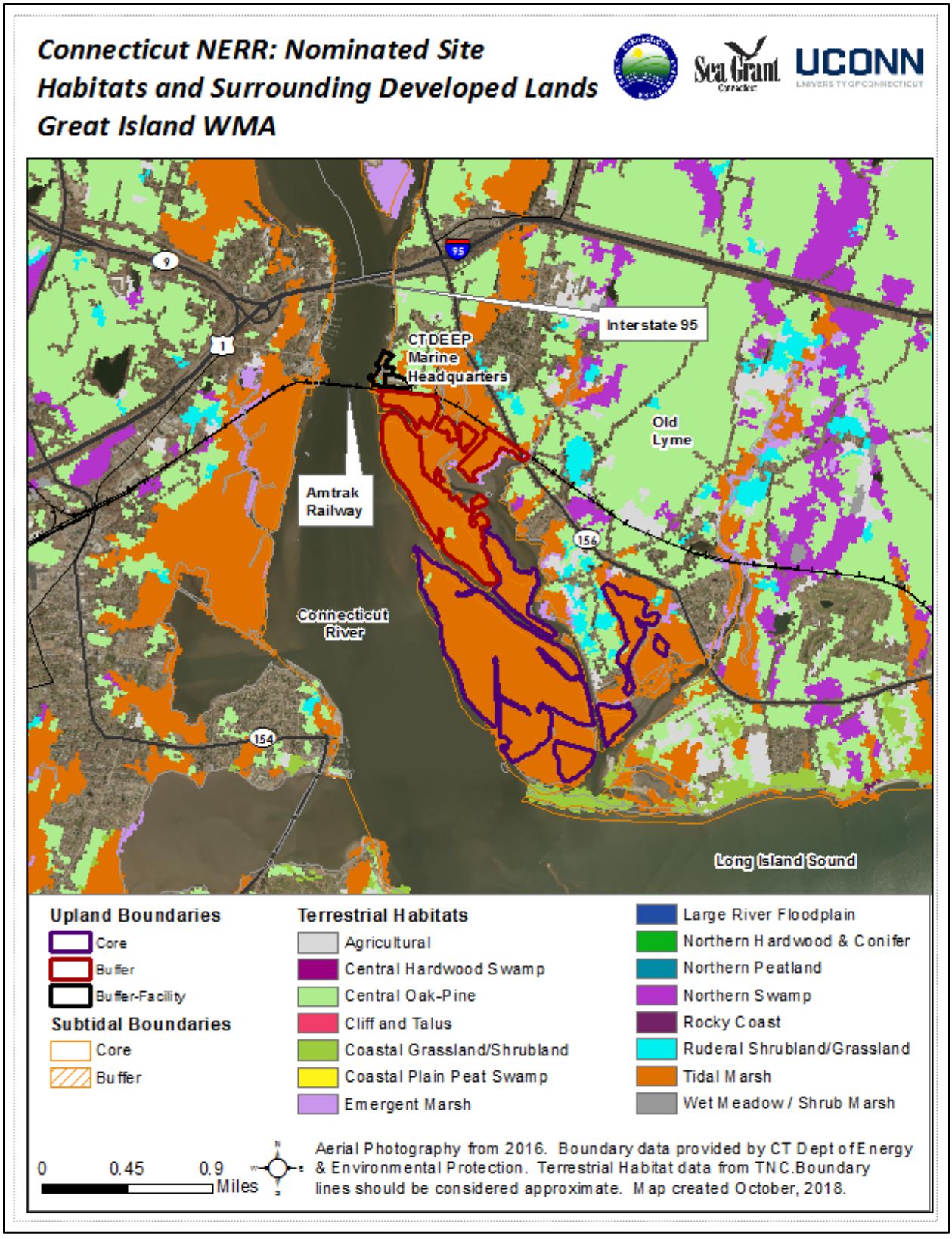

Figure 49: Great Island and surrounding landscape. Note that developed areas are primarily concentrated across the Connecticut River to the west in Old Saybrook, with very small areas immediately near the Reserve itself. Map created by DEEP.

The Bluff Point and Haley Farm locations are approximately 16 miles further to the east in the town of Groton. Compared to the lower Connecticut River Communities, Groton has a much larger population at about 39,000[34], and a different surrounding landscape. Here, there is considerably more development highlighted by Groton-New London Airport located immediately on the western side of site boundary. The airport is a public-use, publicly owned general aviation airport with two runways: 4,000 feet and 5,000 feet long, and a supporting infrastructure that includes a taxiway system, aircraft parking aprons, hangar facilities, etc.). FAA contract tower operating hours are 7 am to 10 pm daily. It serves general aviation, business, recreational and tourist-related demand in southeastern Connecticut but also supports the Army National Guard's 1109th Theatre Aviation Sustainment Maintenance Group (TASMG). The TASMG assists in deployment and redeployment, and provides technical assistance in support of Army aviation.[35] Additionally, the Amtrak railway line runs adjacent to the northern boundaries of Bluff Point and the southern boundaries of Haley Farm. The adjacent and nearby lands reflect a higher degree of development than the lower Connecticut River with neighborhoods, municipal, and commercial enterprises dominating the areas.

[34] Connecticut Demographics: https://www.connecticut-demographics.com/cities_by_population
[35] Groton-New London Airport website: http://www.ctairports.org/airports/groton-newlondon/

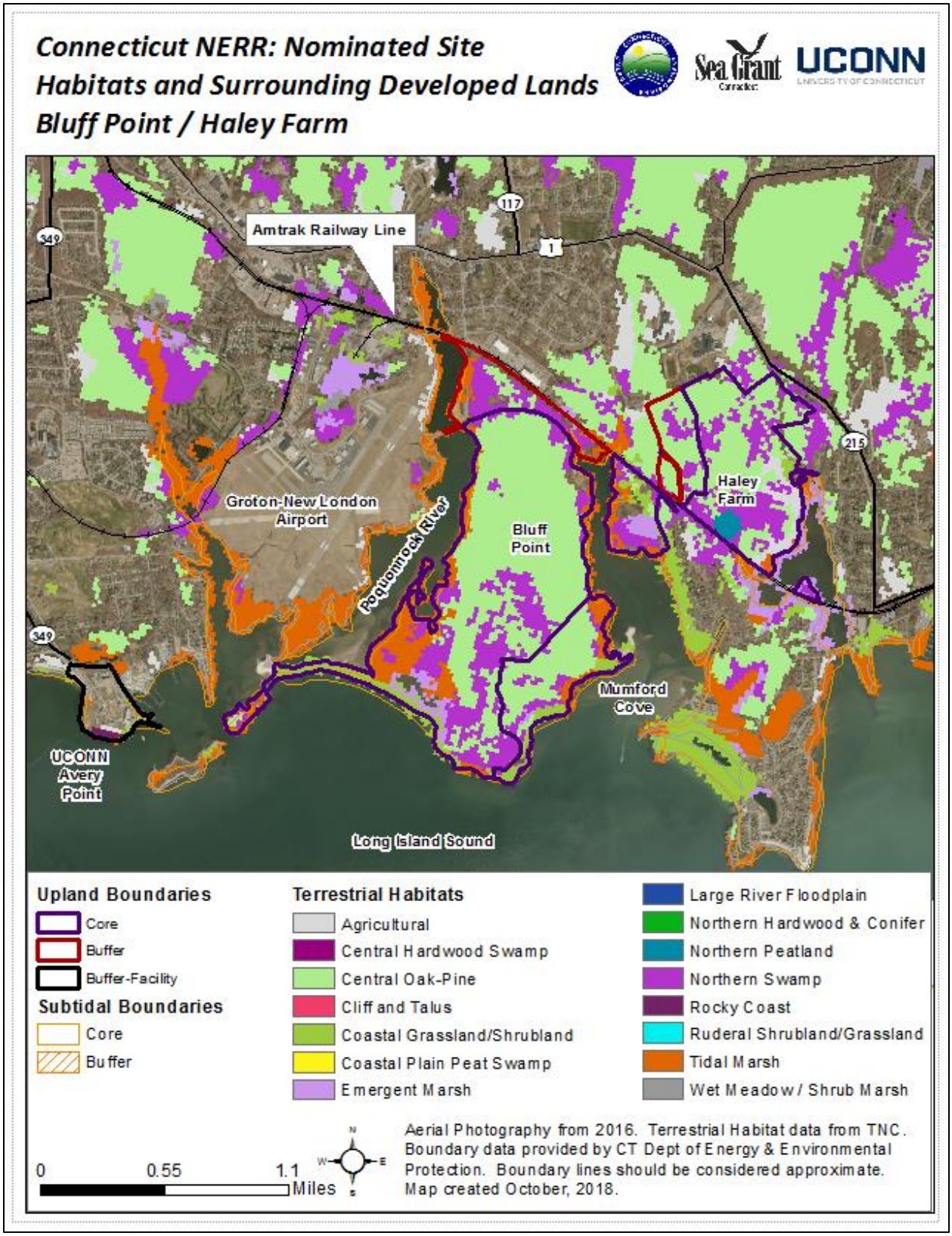

Figure 50: Bluff Point and Haley Farm with surrounding landscape dominated by Groton-New London Airport, the Amtrak Railway, and mixed-use development. Map created by DEEP.

The SST considered developed land uses using two approaches. In each case, "developed" means high-density built-up areas typically associated with commercial, industrial and residential activities and transportation routes. These areas can be expected to contain a significant number of impervious surfaces, roofs, roads, and other concrete and asphalt surfaces.

The first approach, as directed by one of the criterion within the set of Environmental Representativeness, addressed the level of development at a site and within its watershed.

Table 12: Landuse at the site and watershed (local drainage basin) scale as of 2010.

	% Developed	
	Site	**Watershed**
Bluff Point, Haley Farm	2%	29%
Lower Connecticut River (Great Island, Lord Cove)	1%	42%
Total:	**1.6%**	**40.3%**

It should be noted that the use of watersheds, even at the local drainage basin level, can be a bit misleading in this case. The Connecticut River as a watershed is extraordinarily large – the state of Connecticut portion extends all the way to the Massachusetts border - compared to the area of the sites within it.

The criteria set that dealt with Acquisition and Management required the SST to consider landuses as well and in this case, a slightly different approach was employed. Here, the group took a closer look at adjacent lands at a smaller, neighborhood scale of a 0.5 miles buffer (based on best professional judgment of looking just at adjacent parcels vs larger buffer distances) and considered the implications of these as they may relate to future impacts. The results (Table 10) suggest that in the immediate vicinity of the site properties, there are low to moderate levels of currently (ca 2010) developed land. Conversely, there are high to moderate levels of potentially *developable* land. However, when taking into account that some of those lands that are already afforded some level of protection (e.g., they contain tidal wetlands which are protected by statute, or are otherwise classified as protected open space) over half the area (55%) within 0.5 miles of the upland properties taken in total are restricted from future development. This implies that the upland sites are not likely to be threatened by changes to the immediate landscape to such significant degrees that they would threaten the ability to function as a Reserve. In the lower Connecticut River area, this fact is also strengthened by the Lower Connecticut River Gateway Commission, which is able to manage and control

development through zoning practices which limit and minimize the visual impacts of the river scenery.

Table 13: Landuse (Developed areas - potential future state.)

	Total non-NERR Land Acres in 0.5 mile buffer	Developed Acres in 0.5 mile buffer	Percent Developed in 0.5 mile buffer
Lord Cove:	731	24	3%
Great Island:	1026	498	49%
Bluff Point/Haley Farm:	1391	750	54%
Total	**3148**	**1272**	**40%**

	Acres Currently Not Developed (e.g., developable) in 0.5 mile buffer	Percent Not Developed in 0.5 mile buffer	Acres Non Developable (e.g., protected) in 0.5 mile buffer	Percent of Non-Developable land (restricted from future development)
Lord Cove:	707	97%	447	63%
Great Island:	528	51%	386	73%
Bluff Point/Haley Farm:	641	46%	194	30%
Total:	**1876**	**60%**	**1027**	**55%**

Water Uses

Given the substantial offshore area of the Nominated Reserve site, it is not surprising that there are numerous and overlapping water-dependent uses.[36]

Navigation, Infrastructure, & Commerce

There are several noteworthy aspects of the offshore area that bear mention for this topic, all of which are documented on NOAA Nautical charts. The Thames River Navigation Channel is federal channel used by numerous vessels transiting the Thames River area and is periodically maintained via dredging. There are eight "special" and six "unrestricted" anchorage areas in the area that support boating interests. One special anchorage area also doubles as a lightering area. There are three historic (i.e., inactive) and one active open water disposal sites for

[36] Although the NERR site selection process effectively concluded prior to its completion, the Draft Long Island Sound Resource and Use Inventory (v 1.2), a part of the statutorily required Connecticut Blue Plan, provided maps and data to support this section. See https://www.ct.gov/deep/cwp/view.asp?a=2705&q=601262&deepNav_GID=1635.

dredged material, two security zones on the western and eastern shores of the Millstone Energy Facility (located in the Niantic Bay region within the proposed offshore buffer area,) and several corridors for submerged cable and pipelines in both the offshore and riverine areas of the Connecticut and Thames Rivers.

High density vessel transit corridors (areas where vessel transit counts are greater than the average for all Long Island Sound based on analyses of 2017 Vessel Automated Information System (AIS) data[37]) emanate from Connecticut and Thames River areas. The Connecticut River corridor is typically characterized by recreational vessels. The Thames River corridor supports both recreational and commercial traffic including regular ferries to several ports in both New York and Rhode Island, Coast Guard vessels from the New London Coast Guard Station, and naval vessels moving to and from facilities located just north of but outside the proposed site boundaries. A smaller transit corridor primarily supporting recreational boating also intersects the far eastern side of the site originating from the Mystic River in neighboring Stonington, Connecticut.

In addition to these more well-travelled routes, the entire off-shore boundary is within a significant area of eastern Long Island Sound for recreational boating interests[38]. These interests include both ad-hoc routes as well as dedicated areas and lanes for organized boat/yacht races.[39]

[37] Northeast Ocean Data Portal – AIS: https://www.northeastoceandata.org/files/metadata/Themes/AIS/AllAISVesselTransitCounts2017.pdf
[38] Northeast Ocean Data Portal – Recreational Boating: https://www.northeastoceandata.org/files/metadata/Themes/Recreation/RecreationalBoaterRouteDensity.pdf
[39] Northeast Ocean Data Portal – Sailing Races: https://www.northeastoceandata.org/files/metadata/Themes/Recreation/DistanceSailingRaces.pdf augmented by public participation mapping exercises as part of the Long Island Sound Blue Plan.

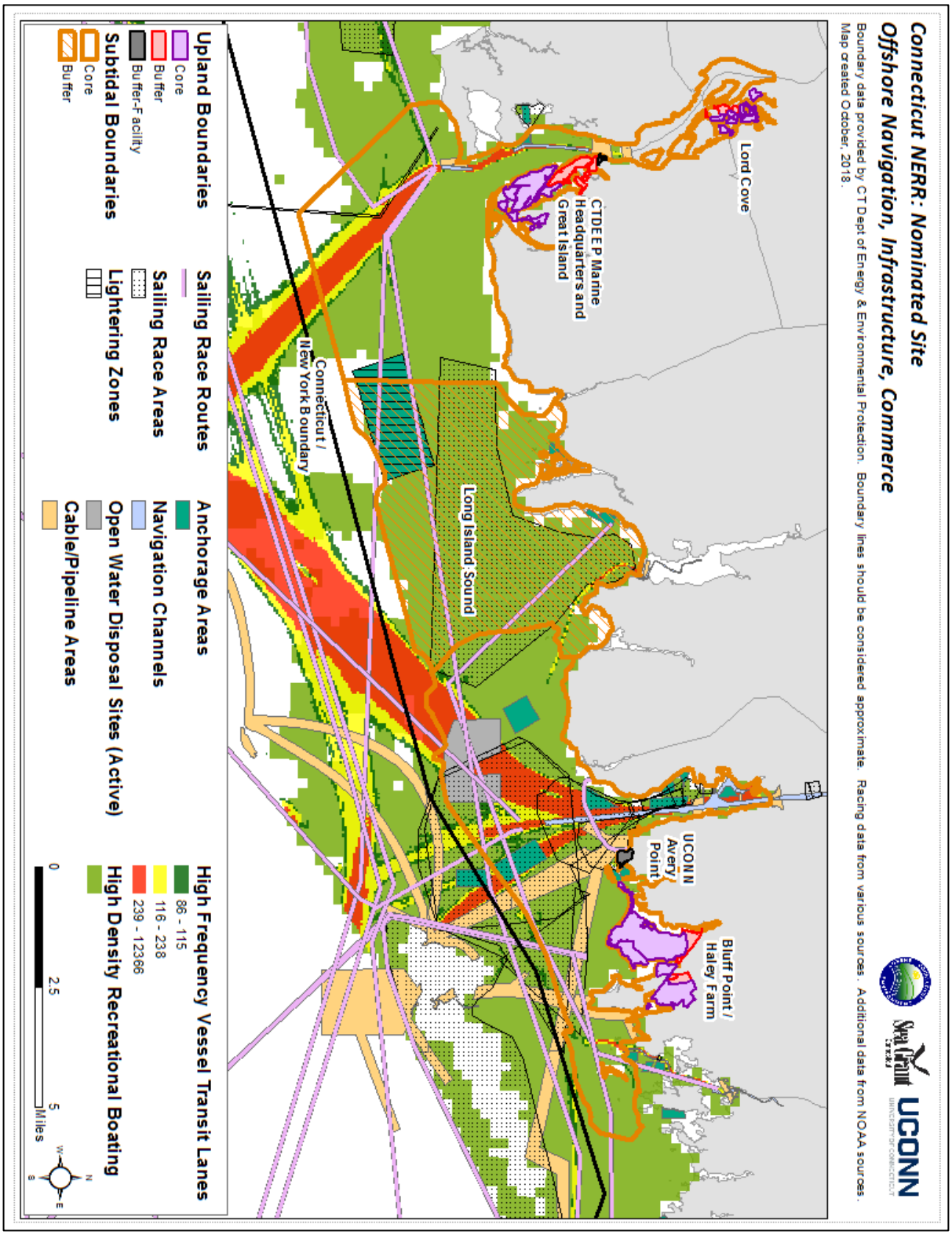

Figure 51: A general depiction of offshore navigation, infrastructure and commerce uses. Map created by DEEP.

Recreational and Commercial Fishing

Recreational and commercial fisheries are an important historic and ongoing use within the proposed offshore area of the Nominated Reserve. Recreational shellfish beds are located immediately adjacent to the eastern and western shores of Bluff Point. Several other recreational beds can be found in the areas of East Lyme, Waterford, and Stonington, which comprise the eastern half offshore area[40]. Similar to recreational boating activity, the interests of recreational fishing are extensive, and can be considered to span the entire offshore area.

Commercial aquaculture operations occur in both state and town owned shellfish lease beds which are mainly concentrated in the more eastern portion of the offshore area from Bluff Point east, although there are several small areas near the East Lyme/Waterford town line[41]. Further, while it is known that commercial fishing operations occur widely throughout LIS, it is not possible to pinpoint precisely where such activities are conducted within the proposed area. However, it is safe to say that the proposed area is a significant source for commercial fishing interests.

[40] Connecticut Department of Agriculture/Bureau of Aquaculture Shellfish Area Contacts, Status Hotlines, and Maps: https://www.ct.gov/doag/cwp/view.asp?a=3768&q=478084
[41] Connecticut Department of Agriculture/Bureau of Aquaculture Shellfish Area Classification Maps: https://www.ct.gov/doag/cwp/view.asp?a=3768&q=478054

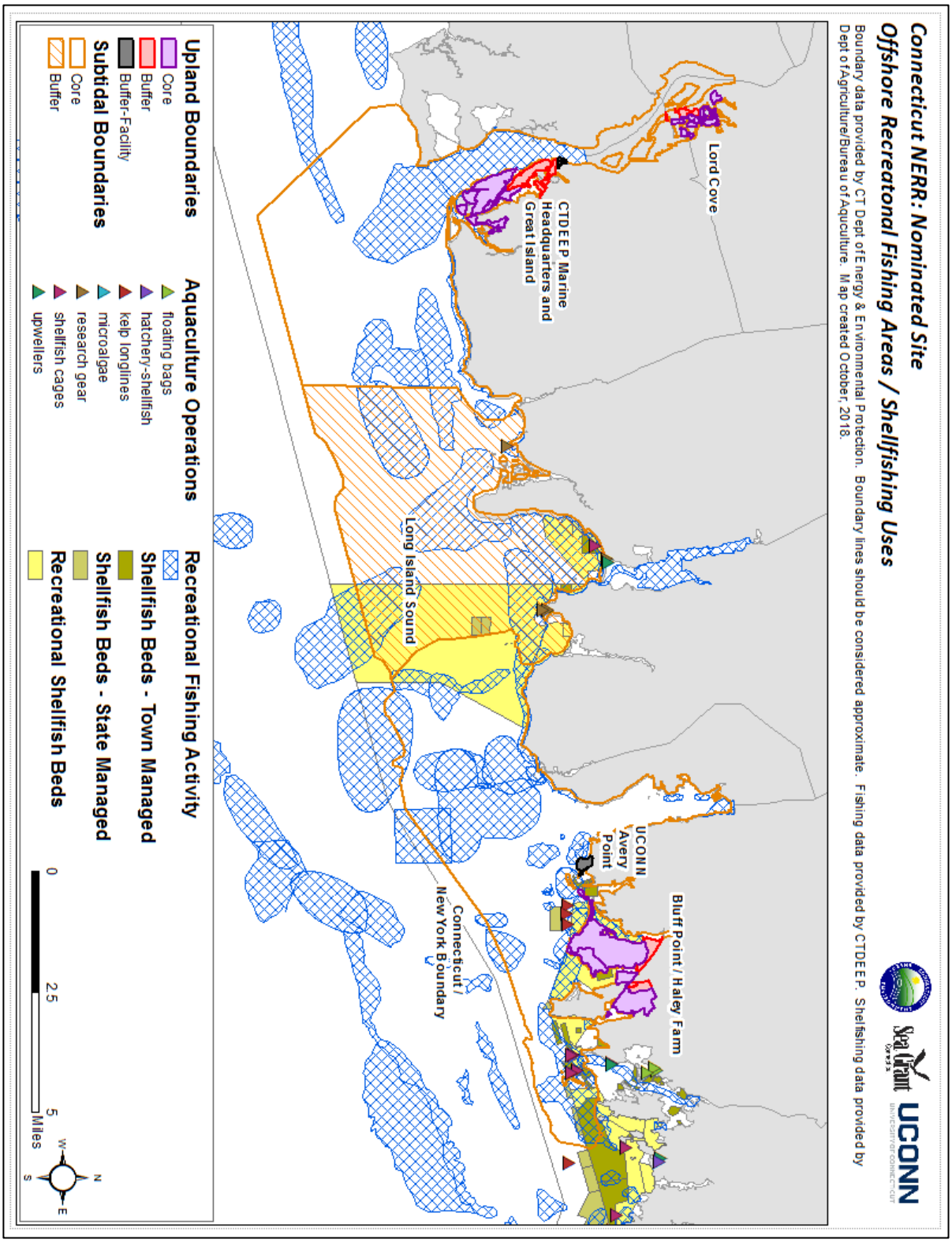

Figure 52: A general depiction of offshore fishing and shellfishing interests. Map created by DEEP.

Water Use Summary

It is important to note that despite their amount and distribution, the activities of boating, commerce, infrastructure, finfishing, shellfishing, etc., have long coexisted with various research and environmental conservation interests across LIS. A Connecticut Reserve and the programs it supports would not be expected to alter the status quo, as it does not impose limits or other use-based restrictions. Conversely, in cases where new or existing water-dependent activities may be proposed, the provisions of the CT Coastal Management Act and any other applicable existing state, federal, or local statutes, regulations, and policies would continue to be applied regardless if an area is designated as a Reserve or not. Therefore, current and potential water-based uses should be considered compatible with Reserve goals and functions.

Existing Plans and Policies

There are several existing plans and policies (outside of those specific to DEEP as the landowner, which are covered in the following section) which share compatible practices and/or goals with a potential Reserve. While not intended to be an exhaustive list, these represent significant linkages towards compatibility.

Connecticut Coastal Management Program[42]: Coastal management in Connecticut is a comprehensive, cooperative program that functions at all levels of government. Connecticut's Coastal Management Program (CMP) is administered by DEEP and is approved by NOAA under the federal Coastal Zone Management Act. Under the statutory umbrella of the Connecticut Coastal Management Act, the CMP seeks to balance growth and use with resource protection, restoration, and enhancement. The CMP also regulates work in tidal, coastal and navigable waters and tidal wetlands under several additional state statues. There are several theme areas the CMP focuses on; those most relevant to and compatible with the Reserve program goals are:

- Watershed Management/Nonpoint Source Pollution Control;
- Protecting Water-Dependent Uses;
- Improving Public Access;
- Restoring Coastal Habitat;

[42] Connecticut Coastal Management Program: https://www.ct.gov/deep/cwp/view.asp?a=2705&q=323536&deepNav_GID=1622

- Facilitating Research;
- Managing and Protecting Coastal Resources;
- Protecting the Public Trust.

Connecticut Wildlife Action Plan[43]: Connecticut recently completed a revision and update of its Wildlife Action Plan (WAP) that establishes a framework for proactively conserving fish and wildlife, including their habitats, for the decade of 2015-2025. This involved adding new information on climate change and its impacts to wildlife conservation, updating resource mapping, refining conservation threats, and incorporating information gained through the implementation of the first Wildlife Action Plan completed in 2005. The revision also included the identification of new or revised conservation actions to help advance wildlife conservation. The proposed Reserve area supports several 'conservation opportunity areas' identified within the WAP including:

- Upland forest blocks;
- Tidal wetlands;
- Diadromous restoration basins;
- Near-shore and open water Horseshoe crab habitat;
- Offshore sturgeon, winter flounder, and tautog habitats.

Reserve program/goals can help support several 'High Priority implementation actions' called out in the WAP such as:

- Increase capacity to create maintain and enhance key habitats on state lands;
- Coordinate efforts regionally and with key partners to address emerging issues that may adversely affect wildlife and key habitats, especially regional conservation priorities and regional species of Greatest Conservation Concern.

DEEP Green Plan[44]: By protecting the state's most important lands, present and future generations can enjoy the ecosystem service benefits provided by intact, functioning natural resources, such as safe drinking water, biodiverse habitats, and plentiful outdoor recreational opportunities. The Connecticut Comprehensive Open Space Acquisition Strategy (Green

[43] Connecticut Wildlife Action Plan: https://www.ct.gov/deep/cwp/view.asp?a=2723&q=329520&deepNav_GID=1719
[44] Connecticut Green Plan: https://www.ct.gov/deep/cwp/view.asp?a=2706&q=511558&deepNav_GID=1641

Plan) guides the efforts by DEEP and its land conservation Partners to meet the goal of conserving 21% of Connecticut's land base as open space by year 2023, as set by section 23-8 of the Connecticut General Statutes. Although the proposed Reserve will not contribute new acreage to land acquisition goals, several of the Land Acquisition Program priorities link and leverage well with Reserve efforts for conservation stewardship and education/training.

- Connecticut Green Plan Administration Priorities
    - Build Partnerships and Public Support for Open Space;
    - Improve Open Space Data and Tools;
    - Develop Strategies for Preserving in Perpetuity State Lands of High Conservation Value.

DEEP Blue Plan[45]: Connecticut's "Blue Plan" legislation establishes a process by which Connecticut will develop an inventory of Long Island Sound's natural resources and uses and, ultimately, a spatial plan to guide future use of the Sound's waters and submerged lands. Currently, Connecticut's Coastal Management Program (CMP) protects coastal resources and guides development along the immediate coast. The development of a Blue Plan for Long Island Sound will supplement the CMP's existing authority in the deeper offshore reaches of the Sound (>10ft NAVD88 bathymetric contour), and be considered as a factor in the regulatory review of other programs such as those under DEEPs Water Planning and Standards Division, the State Department of Agriculture/Bureau of Aquaculture, and local shellfish commissions. The Long Island Sound Blue Plan will help minimize conflicts between marine life and human uses of the Sound, such as navigation and aquaculture. The Blue Plan is intended to prioritize the protection of existing natural resources and uses such as fishing, aquaculture, and navigation from future conflicting or incompatible activities and would not create new regulatory restrictions for them. The Blue Plan is currently in development, and will be submitted for review and approval from the CT Legislature in March of 2019.

Lower Connecticut River Gateway Commission[46]: The mission of the Gateway Commission, a legislatively established state/local compact constituted in 1973, is to preserve the aesthetic and ecological natural beauty of the lower Connecticut River valley for present and future generations through land acquisition and managing the visual impacts of development –

[45] Connecticut Blue Plan: https://www.ct.gov/deep/cwp/view.asp?a=2705&q=574290&deepNav_GID=1635
[46] Lower Connecticut River Gateway Commission: http://ctrivergateway.org/

primarily residential – along the hillsides of the lower river. The management of visual impacts is empowered through the Commission's power to adopt zoning standards. This is a key tool to help ensure the integrity of the Connecticut River marsh systems are not likely to be threatened by development.

Statewide Comprehensive Outdoor Recreation Plan[47]: The Statewide Comprehensive Outdoor Recreation Plan (SCORP) is a planning document that identifies outdoor recreation issues of statewide significance, and evaluates the supply of, and demand for, outdoor recreation resources and facilities in Connecticut. The SCORP provides unified guidance to state and municipal officials as they develop and expand outdoor recreation opportunities for their respective constituents. The following identified goals have natural links to a proposed Reserve:

- Goal 1: Protect, conserve, and manage Connecticut's natural, cultural, and historical resources as they support outdoor recreation.
- Goal 2: Provide clean, safe, well-maintained outdoor recreation areas and facilities.
- Goal 3: Ensure that all residents and visitors can locate and access all outdoor recreation areas and facilities.
- Goal 4: Promote healthy lifestyles through increased participation in outdoor recreation.

Local Harbor Management Plans: Pursuant to CGS Sec. 22a-113m, Harbor Management Commissions (HMCs), in consultation with the Commissioners of Energy and Environmental Protection and Transportation, shall prepare management plans for the most desirable use of their harbor areas for recreational, commercial, industrial and other purposes. For those towns in the coastal area, the plan shall additionally provide for the preservation and use of the coastal resources of the harbor in a manner consistent with the provisions of the Connecticut Coastal Management Act. These Harbor Management Plan (HMP) components that primarily deal with boating management may not tie directly to many Reserve goals, although overall plan objectives that seek to allocate uses of off-shore areas to maximize utilization and minimize detrimental environmental impact, and to support the maintenance of wildlife habitats are consistent with Reserve goals.

[47] Statewide Comprehensive Outdoor Recreation Plan: https://www.ct.gov/deep/lib/deep/stateparks/parks/DEEP_SCORP_2017-2022_NPS_Final_Version.pdf

- Towns within the proposed Reserve with Approved Harbor Management Plans: City of Groton, Noank, Town of Groton, Old Saybrook, Essex, Old Lyme, East Lyme, Waterford, Stonington;
- Towns within the proposed Reserve with Harbor Management Plans in the Planning Stage: Town of Groton.

Long Island Sound Study Comprehensive Conservation and Management Plan[48]: Since the federal Clean Water Act became law in 1972, investments in water pollution control programs have led to measurable improvements in the water quality of Long Island Sound. Obvious sources of pollution were controlled through permit programs. Tidal wetlands were protected, wastewater treatment plants improved, and industrial discharges controlled. However, to fully restore the health of the Sound, a cooperative effort focusing on the overall ecosystem was needed. As a result, EPA, New York, and Connecticut formed the Long Island Sound Study (LISS) in 1985, a bi-state partnership consisting of federal and state agencies, user groups, concerned organizations, and individuals dedicated to restoring and protecting the Sound. Through a series of comprehensive management plans, LISS and its partners have made significant and measurable strides in addressing plan goals and affecting positive environmental outcomes. The current version includes four thematic goals which dovetail with Reserve goals and programs:

- *Clean Waters and Healthy Watersheds* – Improve water quality by reducing contaminant and nutrient loads from the land and the waters impacting Long Island Sound.
- *Thriving Habitats and Abundant Wildlife* – Restore and protect the Sound's ecological balance in a healthy, productive, and resilient state for the benefit of both people and the natural environment.
- *Sustainable and Resilient Communities* – Support vibrant, informed, and engaged communities that use, appreciate, and help protect Long Island Sound; and.
- *Sound Science and Inclusive Management* – Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.

[48] Long Island Sound Study Comprehensive Conservation and Management Plan: http://longislandsoundstudy.net/about/our-vision/

Specific Land Owner Policies

All of the land area within the Nominated Reserve is publicly-owned by the State of Connecticut Department of Energy and Environmental Protection. The offshore and riverine areas are held in the public trust by the State of Connecticut. None of the proposed site is federally owned. The following sections briefly explain the specific land owner policies. In each case, they can be considered consistent with the objectives of a Reserve as they all seek to conserve environmental features and values as well as provide for recreation and access.

Bluff Point: Bluff Point was designated a "Coastal Reserve" by a special act of the Connecticut legislature in 1975 to establish the area "for the purpose of preserving its native ecological associations, unique faunal and floral characteristics, geological features and scenic qualities in a condition of undisturbed integrity". Activities allowed include hiking, mountain biking, saltwater and shellfishing (which requires a permit from the Town of Groton.) A car top/carry-in boat launch is also available, and handicap parking is available. Pets are permitted from April 1 to September 1, although dogs and horses are not allowed on the beach. Because of its Coastal Reserve designation, access to the bluff at the southern end is by foot or non-motorized vehicle only.

Haley Farm State Park: The park has been preserved as open space and is used for passive recreational purposes. A 0.8-mile bike trail winds its way through the scenic old shoreline farm and supports both biking and hiking/jogging. Nearby Bluff Point State Park and Coastal Reserve can be reached from Haley Farm via a bridge over the railroad tracks that separate the two properties. Handicap access to both parking and trails are supported, and leashed pets are allowed.

A complete list of regulations governing activities at Haley Farm State Park and the Bluff Point Coastal Reserve are found in the Regulations of Connecticut State Agencies, Title 23 Sec 23-4-1 through 23-4-35[49].

Great Island and Lord Cove Wildlife Management Areas[50]: Connecticut's wildlife resources are managed to maintain stable, healthy populations of wildlife, including endangered and

[49] Department of Energy and Environmental Protection State Park Rules: https://eregulations.ct.gov/eRegsPortal/Browse/getDocument?guid=%7B3C64A5F8-B731-4393-A6AB-EA64B91A3F63%7D

[50] State Wildlife Management Areas: https://www.ct.gov/Deep/cwp/view.asp?A=4173&Q=503016 and

threatened species, in numbers compatible with both habitats, carrying capacity, and existing land use practices. To support a diversity of wildlife, habitats are managed on state forests and wildlife management areas (WMAs). WMAs are areas of land and water having unique or outstanding wildlife qualities that are managed primarily for the conservation and enhancement of fish and wildlife and to provide opportunities for fish and wildlife-based recreation. At the Great Island and Lord Cove WMA's, motorized vehicles and camping are prohibited. Public hunting opportunities are managed at both properties. Hunting seasons and bag limits are regulated for harvestable wildlife species; waterfowl hunting is permissible without a permit. Both also allow boat launch access (trailered/car-top/carry-in at Great Island, and car-top/carry-in at Lord's Cove.) The wetland habitats on these properties are managed through the maintenance of water control structures, invasive plant control, pothole creation in marshes, and the installation of wood duck nest boxes. Routine maintenance responsibilities on WMAs include boundary and sign posting and the repair and maintenance of parking lots, gates, interior road systems, and wildlife viewing areas.

https://www.ct.gov/deep/cwp/view.asp?a=2723&q=325728&deepNav_GID=1655

ENVIRONMENTAL IMPACT STATEMENT AND MANAGEMENT PLAN

As required by the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.), an EIS is will be completed for the CT NERR designation. A MP is also required by NOAA for operation of the NERR. The draft MP (DMP) for the proposed CT NERR will be written as an attachment to the draft EIS (DEIS). Prior to writing the document a scoping meeting will be held by NOAA to identify alternatives and issues to be included in the DEIS/DMP. Connecticut will develop the DMP, and will provide NOAA with the information necessary to complete the EIS.

Upon completion of the DEIS/DMP, a public meeting will be held and additional comments collected during a 45-day period. The public comments will be incorporated into the final EIS and final MP. The final EIS/MP is then submitted for final review and public comment.

Not less than 30 days after the publication of the USEPA Notice of Availability of the final EIS's, NOAA may issue a Record of Decision (ROD) documenting its decision concerning the proposed NERR designation.

Sample DEIS & DMP Outline

(Standard Outline Approved for Use by NOAA)

The outline below provides a starting point for discussions on what issues and items should or should not be addressed in the DEIS/DMP. The sections that meet DEIS requirements are noted as "DEIS," and the sections which meet DMP requirements are noted as "DMP."

Cover Sheet (DEIS)
Summary
Table of Contents

1.0 Introduction (DMP)
- 1.1 The National Estuarine Research Reserve System
- 1.2 Proposed mission and goals of the Reserve

2.0 Purpose of and Need for Action (DEIS)
- 2.1 Explain who wants to do what; where how and when they want to do it; and why.
- 2.2 Explain any other documents that influence the scope of this EIS.
- 2.3 Explain the decision to be made and identify any other agencies involved in this analysis.

2.4 Summarize the scoping and explain the significant issues.

2.5 List Federal permits, licenses, and entitlements necessary to implement the project.

2.6 Preview the remaining chapters of your DEIS/DMP.

3.0 Alternatives Including the Proposed Action (DEIS)

3.1 Explain that this chapter describes the alternatives (potential actions) and summarizes the environmental consequences of the alternatives.

3.2 Describe the alternatives, including the proposed action and no action.

3.3 Explain how these alternatives represent a range of reasonable alternatives.

3.4 Compare the alternatives by summarizing their environmental consequences.

3.5 Identify the preferred alternative. (DEIS)

3.5.1 Administration plan (DMP)

3.5.2 Existing resource protection (DMP)

3.5.3 Boundaries/acquisition plan (if applicable) (DMP)

3.5.4 Stewardship plan (DMP)

3.5.5 Restoration/Resource manipulation plan (DMP)

3.5.6 Public access plan (DMP)

3.5.7 Facilities/construction plan (DMP)

3.5.8 Research and monitoring plan (DMP)

3.5.9 Education/interpretation/outreach plan (DMP)

3.5.10 Volunteer plan (DMP)

4.0 The Affected Environment. Describes the current resources. This is the baseline environment for analytical purposes. (DEIS)

4.1 Biogeographic region analysis.

4.2 Physical aspects.

4.3 Geology.

4.4 Biology and habitats (ecology).

4.5 Human environment/impact.

4.6 Cultural aspects.

Note: Resources include all physical, biological, social, and economic features of the human environment.

Note: Significant issues (resources) should receive more extensive discussion than nonsignificant issues.

5.0 Environmental Consequences (DEIS)

5.1 General impacts. (DEIS)

5.2 Specific impacts. (DEIS)

5.3 Unavoidable adverse environmental or socioeconomic impacts. (DEIS)

5.4 Relationship between the proposed action on the environment and the maintenance and enhancement of long-term productivity. (DEIS)

5.5 Irreversible and irretrievable commitment of resources. (DEIS)

5.6 Possible conflicts between the proposed action and the objectives of federal, state, regional, local, and native land use plans, policies and controls for the areas concerned. (DEIS)

6.0 List of Preparers (DEIS)

7.0 References

Appendices

Sample State-Federal Memorandum of Agreement

Below is a sample Memorandum of Agreement that can serve as the basis for developing a final version during subsequent management planning phases. The State-Federal Memorandum of Agreement on page 1125 of the 2009-2014 Reserve Management Plan of the Jacques Cousteau NERR in New Jersey served as a template.[51] The sample includes placeholder notations for elements that will be finalized during the development of the Connecticut NERR Management Plan.

******SAMPLE******

Memorandum of Agreement

Between the

National Oceanic and Atmospheric Administration

And

<State of Connecticut NERR Management Entity>

Detailing the state-federal roles in the

Management of the ***<Connecticut National Estuarine Research Reserve>***

[51] Jacques Cousteau State-Federal MOA: https://coast.noaa.gov/data/docs/nerrs/Reserves_JCQ_MgmtPlan.pdf.

This Memorandum of Agreement states the provision for the cooperative management of the ***<Connecticut National Estuarine Research Reserve>*** in the state of Connecticut, between ***<State of Connecticut NERR Management Entity>*** and the National Oceanic and Atmospheric Administration's Office for Coastal Management.

WHEREAS, the state of Connecticut has determined that the land and waters of ***<provide final geographic description of Reserve areas>*** provide unique opportunities for the study of natural and human processes occurring within estuarine ecosystems of the state to contribute to the science of estuarine ecosystem process, enhance environmental education opportunities and provide scientific information for effective coastal zone management in the state of Connecticut: and

WHEREAS, the State of Connecticut has determined that the resources of ***<Connecticut National Estuarine Research Reserve>*** and the values they represent to the citizens of Connecticut and the United States will benefit from the management of these resources as part of the National Estuarine Research Reserve System; and

WHEREAS, the National Oceanic and Atmospheric Administration has concurred with that finding and pursuant to its authority under section 315 of the Coastal Zone Management Act, as mended (CZMA, 16, U.S.C. 1461) and in accordance with the implementing regulation sat 15 CFR 921.30 has designated the ***<Connecticut National Estuarine Research Reserve>*** ; and

WHEREAS, ***<State of Connecticut NERR Management Entity>***, as the entity designated by the State of Connecticut is responsible for managing the ***<Connecticut National Estuarine Research Reserve>*** and acknowledges the value of state-federal cooperation for the long-term management of the reserve in a manner consistent with the purpose of their designation; and

WHEREAS, the management plan describes the goals, objectives, strategies/actions, administrative structure, and institutional arrangements for the reserve, including this MOA and others;

NOW THEREFORE, inconsideration of the mutual arrangements herein, NOAA and the ***<State of Connecticut NERR Management Entity>*** agree to following:

ARTICLE 1: STATE-FEDERAL ROLES IN RESERVE MANAGEMENT

A. ***<State of Connecticut NERR Management Entity>*** Role in Reserve Management:

<State of Connecticut NERR Management Entity> shall:

1. Be responsible for compliance with all federal laws and regulations, and ensure that the management plan is consistent with the provisions of the CZMA and implementing regulation;
2. Ensure protection of the natural and cultural resources of the reserve and ensure enforcement of the provisions of state law, including the rules and regulation of the Connecticut Department of Energy and Environmental Protection;
3. Ensure adequate, long-term protection and management of lands included within the reserve boundary;
4. Annually apply for, budget, and allocate funds received for reserve operations, research, and monitoring, education and stewardship, and as necessary, land acquisition and reserve facility construction;
5. Conduct and coordinate research and monitoring programs that encourage scientists from a variety of institutions to work together to understand the ecology of the reserve ecosystem to improve coastal management;
6. Conduct and maintain programs that disseminate research results to resource users, state and local agencies, school systems, the general public and other interested parties;
7. Provide staff, and endeavor to secure funding for the manager, education coordinator, research coordinator, and stewardship coordinator;
8. Secure facilities and equipment required to implement the provisions within the reserve management plan;
9. Ensure adequate funding for facilities operation and maintenance;
10. Maintain effective liaison with local, regional, state, interstate, and federal policy makers, regulators, and the general public;
11. Serve as principal contact of the issues involving proposed boundary changes and/or amendments to the reserve management plan;
12. Respond to NOAA’s requests for information, particularly cooperative agreement and grant progress reports and evaluation findings, including necessary actions and recommendations, made pursuant to Section 312 of the CZMA;

13. Expend funds in accordance with federal and state laws, the reserve management plan, and annual guidance from NOAA.

B. Federal Role in Reserve Management:

NOAA's Office for Coastal Management shall:

1. Administer the provisions of Sections 312 and 3115 of the CZAM to ensure that the reserve operates in accordance with the goals of the reserve system and the ***<Connecticut National Estuarine Research Reserve>*** management plan;
2. Review and process applications for financial assistance from ***<State of Connecticut NERR Management Entity>***, consistent with 15 CFR 921, for management and operation, and as appropriate, land acquisition and facility construction;
3. Advise ***<State of Connecticut NERR Management Entity>*** of existing and emerging national and regional issues that have bearing on the reserve and reserve system;
4. Maintain an information exchange network among the reserve system, including available research and monitoring data and educational materials developed within the reserve system;
5. To the extent possible, facilitate NOAA resources and capabilities in support of reserve goals and programs.

C. General Provisions

1. Nothing in this agreement or subsequent financial assistance awards shall obligate either party in the expenditure of fund, or for future payments of money, in excess of appropriations by law.
2. Upon termination of this agreement or any subsequent financial assistance awards to ***<State of Connecticut NERR Management Entity>***, any equipment purchased for studies to further this agreement will be disposed of in accordance with 15 CFR 24.32.
3. A free exchange of research and assessment data between the parties is encouraged and is necessary to ensure success of cooperative studies.

D. Other Provisions

1. Nothing in this agreement diminishes the independent authority or coordination responsibility of either party in administering its respective statutory obligations. Nothing in this agreement is intended to conflict with written directives or policies of either party. If the terms of this agreement are inconsistent with existing written directives or policies of either party entering this agreement, then those portions of the agreement which are determined to be inconsistent with such written directive and polices shall be invalid; but the remaining terms not affected by the inconsistency shall remain in full force and effect. At the first opportunity for revision of this agreement, all necessary changes shall be made by either an amendment to this agreement or by entering into a superseding agreement, whichever is deemed expedient to the interested parties. Should disagreement arise on the interpretation of the provisions and/or amendments of this agreement that cannot be resolved by negotiations at the operating level of each party, the area(s) of disagreement shall be stated in writing by each party and promptly presented to a mutually approved mediator for non-binding mediation. If the parties cannot agree on the choice of a mediator or if the mediation does not resolve the dispute to the mutual approval of the parties, the parties are free to pursue any other legal remedies hat are available.

ARTICLE 2: REAL PROPERTY ACQUIRED FOR THE PURPOSE OF THE RESERVE

As well as acknowledging the rest of the requirements set forth at 15 CFR 921, ***<State of Connecticut NERR Management Entity>*** specifically acknowledges and will fully comply with the conditions set forth at 15 CFR 921.21 (e), which specify the legal documentation requirements concerning the use and disposition of real property acquired for reserve purposes with federal funds under section 315 of the CZMA.

ARTICLE 3: PROGRAM EVALUATION

NOAA's Office for Coastal Management will schedule periodic evaluations of ***<State of Connecticut NERR Management Entity>*** performance in meeting the terms of this agreement, financial assistance awards, and the reserve management plan. Where findings of deficiency occur, NOAA may initiate action in accordance with the designation withdrawal or interim sanctions procedures established by the CZMA and applicable regulations at 15 CFR 621.40-41.

ARTICLE 4: EFFECTIVE DATE, REVIEW, AMENDMENT AND TERMINIATION

A. This agreement is effective on the date of the last signature on this agreement and shall be in effect until terminated by either party.
B. This agreement will be reviewed periodically by both parties and may only be amended by mutual written consent of both parties.
C. This agreement may be terminated by mutual consent of both parties or by NOAA if NOAA withdrawals designation of the reserve within the reserve system, pursuant to applicable provisions of the CZMA and its implementing regulations described under 15 CFR 923 Subpart L, or if NOAA finds that ***<State of Connecticut NERR Management Entity>*** fails to comply with this MOA. The agreement may be terminated by ***<State of Connecticut NERR Management Entity>,*** with or without cause. Should this agreement be terminated, reimbursement of unexpended funds from financial assistance awards shall be determined on a pro rata basis according to the amount of work done by both parties at the time of termination. Additionally, reimbursement for land purchased and facilities constructed with NOAA funds shall be consistent with the terms and special award conditions of financial assistance awards.
D. If any clause, sentence, or other portion of this MOA shall be come illegal, null or void for any reason, the remaining portions of this MOA shall remain in full force and effect.
E. No waiver of right by either party of any provision of this MOA shall be binding unless expressly confirmed in writing by either party giving the waiver.

IN WITNESS THEREOF, the parties have caused this agreement to be executed.

<Federal Signatures>
<State Signatures>

APPENDICIES

1. Letters of Importance
2. CT National Estuarine Research Reserve Site Selection Process Document (Final – Spring, 2016)
3. Preliminary Screening Assessment: Property List and Summaries
4. Preliminary Site Assessment Report Example: Hammonasset Natural Area Preserve
5. NERR May 16, 2017 Preliminary Public Meeting Materials
6. Detailed Site Selection Team Recommendation Reports and Scoring Materials
7. NERR November 13, 2018 Public Meeting Materials
8. Significant Flora and Fauna Materials