



OPEN SPACE CONSERVATION PLAN FOR THE TOWN OF GROTON CONNECTICUT

ABRIDGED EDITION

**NOTE TO THE READER: CHAPTER AND SECTION
NUMBERS CORRESPOND TO THE UN-ABRIDGED PLAN,
AND SOME ITEMS HAVE BEEN REMOVED TO REDUCE
THE SCOPE OF THIS SUMMARY DOCUMENT.**

Prepared and Adopted by

TOWN OF GROTON CONSERVATION COMMISSION

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1. Introduction and Overview of Open Space

Historically, undeveloped open space was common in Connecticut and its preservation was not a public priority. As time passed, Connecticut, like the rest of the country, grew economically and its population increased. The development that had been concentrated in key areas, generally along waterways, spread out as roads were built and cars became the preferred mode of transportation. Suburban development replaced rural lands and today all of Connecticut is under increasing development pressure. While progress has been made over the decades on preserving open space, lands of high conservation and recreation value continue to be lost to development, even with the current economic conditions. Conservation lands increase greatly in value when they are interconnected with other conservation lands. One parcel of land lost to development at a critical junction can diminish the conservation and recreation value of surrounding lands. With careful planning, it is possible to have economic and population growth while protecting valuable open spaces. Groton's citizens have both an opportunity and responsibility to decide the future of our Town's landscape by permanently protecting certain undeveloped areas as open space.

1.1 Purpose of the Open Space Conservation Plan

The Open Space Conservation Plan for the Town of Groton stems from a critical need to identify natural, cultural and available open space resources that should be conserved as protected open space, to identify methods to achieve balanced conservation objectives, and outline the stewardship of protected parcels. It is increasingly important to make land use decisions that protect sensitive resources and habitats, encourage citizen support and participation in these decisions, and provide guidance to land developers and development consultants to work with the Town to achieve common open space objectives.

The Conservation Commission has determined for its Open Space Conservation Plan to utilize a two consideration approach – the first is acquisition, it sets forth a strategy for approaching significant decisions for land use relative to open space versus development and identification of a process to identify the best overall value for future open space acquisition; the second is stewardship, which addresses best practices for long-term protection for town held open space. The plan also serves as a reference document for the scientific background utilized in the development of the analytic methods, as well as the establishment of the priorities detailed within the plan. As such, it will be utilized by the Town of Groton Conservation Commission as the basis for future evaluations, recommendations and development of detailed acquisition plans for worthy parcels. It is anticipated that this more methodical process will become the standard practice for Conservation Commission actions, provide for a more analytic and transparent process, and ultimately benefiting the citizens of Groton.

This plan is a good faith effort of volunteers and professionals to collect information about and establish priorities for the protection of the land and resources of Groton. The Conservation Commission recognizes that without information about the natural, cultural and economic value of the resources of the Town; it is very difficult to develop a meaningful, defensible and implementable plan to conserve our open spaces, including sensitive natural and cultural resources.

While this Plan does advocate for protecting certain resources it does not do so in a vacuum, as it recognizes the value of individual property rights and the importance of reasonable and responsible growth and development in Groton. It is hoped that this plan will serve as an important tool for future planning.

1.2 Definitions of Open Space

For the purposes of evaluating and acquisition of open space lands, the Conservation Commission will utilize the State of Connecticut Department of Energy and Environmental Protection (DEEP) definition of “protected open space” as defined below.

PROTECTED OPEN SPACE	PRESERVED OPEN SPACE
Any area of land with a restriction that would limit its use to open space. <i>Includes lands subject to conservation restrictions, deed restrictions, or certain reserved rights.</i>	Any area of land that has been acquired and is used for open space purposes. <i>Includes DEEP's State Parks, State Forests, and Wildlife Areas, and Class I and II watershed lands</i>

1.3 Why Protect Open Space

Although each protected parcel has its own unique value, open space as referred to in this Open Space Conservation Plan provides a wealth of valuable “services” to Groton’s citizens. Forested areas are especially adept at removing carbon dioxide from the atmosphere, which helps to minimize global climate change. Floodplains, coastal waterfront and adjacent uplands provide opportunities to respond to the anticipated effects of climate change. Open space also can provide a variety of specific ecological functions such as preserving biodiversity, habitat for rare species, streamflow and water supply protection, and flood control. Other valuable open space services are the provision and preservation of scenic beauty, opportunity for residents to enjoy and experience interacting with nature in an unspoiled form. Other land such as forestry and farm land contribute sustainably to the local economy and enhance the diversity of Groton’s landscape. Human health benefits of living in close proximity to green/open spaces with public access include improved physical and mental health, reduced risks of cardiovascular disease, obesity, diabetes, and improved pregnancy outcomes. As documented by the Georgetown University Climate Center, providing access to green/open space to all populations is important so that everyone can benefit from the improved health outcomes, especially disadvantaged groups ([Ref 1](#)).

While the full list of benefits is too extensive to include here, these services include options for outdoor play, activity, and environmental education. Open space protection will play an expanding role in Groton’s economic future as businesses increasingly consider quality of life in making decisions on where to locate and expand. As developed in section 5, tax revenue generally increases in the long term based on the higher value of homes within a half mile of open space.

1.4 The Vision for Open Space in Groton

A diverse landscape of protected open space that equitably offers outdoor recreation to Groton's citizens, protects water supplies, preserves natural communities and habitats for plants and animals, offers green spaces accessible to all residents, whether residing in urban, suburban or rural part of our community. It also provides a working natural landscape for the harvest of farm products, as well as associated climate change mitigation benefits.

This Open Space Conservation Plan establishes specific open space acquisition priorities in section 3. This plan includes specific recommendations and actions that advance the town's land conservation efforts, including development of Greenbelts for corridors and connection of open spaces, and protection of the most appropriate remaining land for public use and benefit. Specifically, lands that are used for natural resource protection, conservation, public enjoyment, recreational purposes, or any activity associated with improving or maintaining such purposes.

The plan is designed to establish a basis and formal process for evaluation of open space which includes an economic assessment model for quantifying tangible benefits of open space, in addition to incorporation of intangible factors, into a holistic and comparative approach to the evaluation of individual open space acquisition opportunities and future proposals. The proposed land acquisitions found further in section 6.2 of this document were developed by the Conservation Commission through the compilation of information and prioritization utilizing this plan.

Future efforts of the Conservation Commission will focus on development individual open space parcel stewardship management plans, and to implement and expand upon the University of New Hampshire Extension program on "What Conservation Commissions Can Do to Protect Natural Resources in a Changing Climate" ([Ref 2](#)). The Conservation Commission recognizes its responsibilities to support the development of effective long-term programs to ensure the necessary stewardship of the Town of Groton open space is conducted by the town staff, and is coordinated with the other local open space parcel holders and interested volunteers.

1.6 The Way Forward for Open Space in Groton

This Open Space Conservation Plan is an important step in the process of making decisions about the future of Groton - i.e. which lands should be conserved and which lands should be considered for development. Many of these decisions will be the combined work of the Town Staff, the Groton Planning and Zoning Commission, the Parks and Recreation Commission, the Conservation Commission, the Town Council, the Representative Town Meeting and ultimately the Citizens of Groton.

This plan also provides a process to evaluate and prioritize potential open spaces for acquisition. It was developed to quantify and compare various options as fairly as possible, and to maintain a consistent approach for the conduct of evaluations. The eight basic criteria selected for the evaluation process are:

- Alignment to Town of Groton Plan of Conservation and Development (POCD) and Greenbelt Connections
- Areas significant to the coast with climate change impact
- Natural water features and drinking water resources
- Woodlands and carbon sequestration
- Native flora and fauna preservation
- Natural heritage resources
- Natural resource based outdoor recreation
- Open Space Economic Value Analysis results

Finally, this Open Space Conservation Plan is to be utilized as input to annual budget processes and future revisions of the POCD, next expected to be adopted in 2026.

2.0 Open Space in Groton

The character of Groton comes from many sources: the people, schools, business ventures, military activities, buildings, social groups, special events in the community, its history and much more. Common to all this is the land. The topography, soils, streams and rivers, areas of forest, farm and meadow all play a vital role in supporting our community, and developing our overall “sense of place”.

Groton’s future is also tied to the land. Improvements in construction technologies make it possible for people to build in almost any location or alter almost any landscape. In the past the very form of the land, such areas as steep slopes, wetlands, and outcrops, provided protection to many vital parts of our ecosystem. Along with these advancements in construction, advancements in transportation, electricity, refrigeration and even entertainment have made living in dispersed patterns more desirable. All this has combined with growth and changes in population to create pressure to build, particularly housing, in almost any and every location in Groton, just as technology has provided the tools to do just that. However, it is noted that the town has developed detailed zoning regulations that restrict and protect environmental spaces like wetlands and riparian areas, as well as detailing what specific types of development is allowed for each designated zoning district.

For many residents, however, this is not acceptable. Many aspects of the land, including the natural systems, and the flora and fauna living on and in the land are valuable enough that they demand some sort of protection. At a minimum, many agree that protecting the natural resources are key to the functioning of the earth. It is important to protect habitats that allow the native plants and animals of the area to continue to be part of our community. In addition, some areas are valuable as recreational resources or are critical because of their historic content or simply because of the visual quality that makes Groton unique.

2.2 Open Space Inventory

Figure 2-1 illustrates a consolidated inventory of all open space properties monitored by the Conservation Commission in the Town of Groton. It takes into account the section 1 definitions for protected open spaces, in order to provide a comprehensive assessment of land use, support

the economic analysis conducted by the Commission and recommendations to interested parties. As such, the commission maintains a detailed information database including the protected status of each property, its POCD identified use, and desirability, as well as the parcel's economic value as evaluated by the commission.

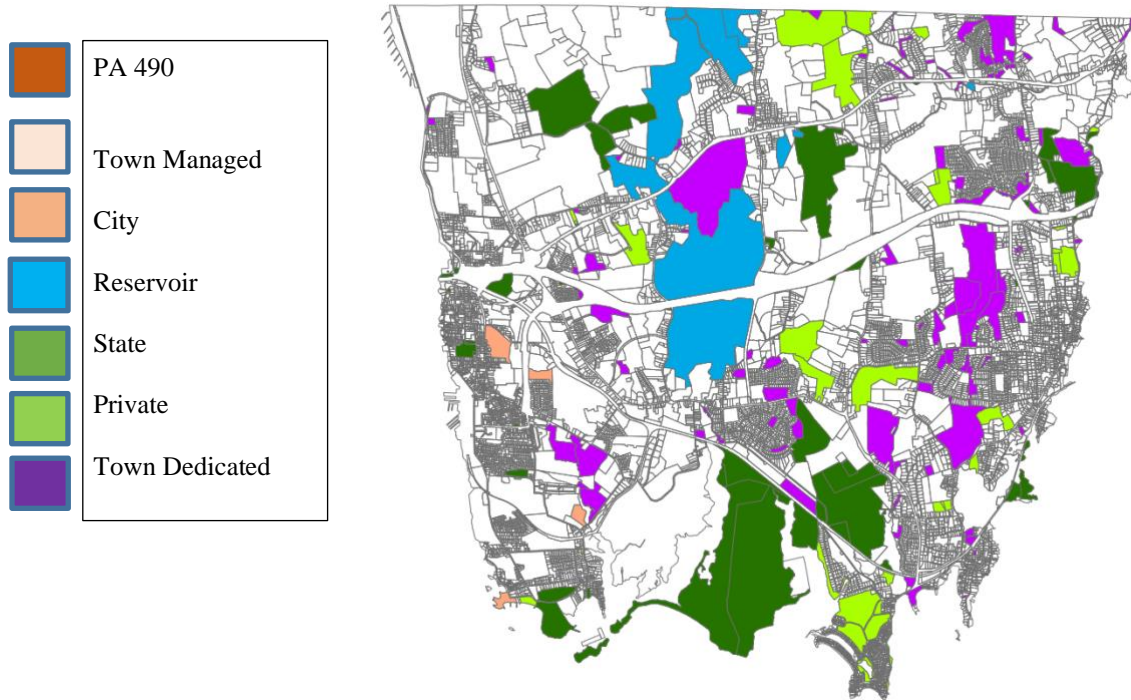


Figure 2-1 2020 Groton Open Space Inventory Map

2.3 Greenbelts and Greenways in Groton

Greenbelts, previously called Green Breaks in the 1990 Conservation Plan, refer to open space linkages that join open spaces into a cohesive whole greater than the equivalent amount of land separated into many small parcels. When properly planned, greenbelts can link existing parks and open space areas with neighborhoods and community facilities, including schools, and provide an interconnected network serving town residents. Additionally, the Greenbelts can provide wildlife larger contiguous areas to support migration and expanded habitat utilization.

In light of this, habitat corridors provide numerous benefits for plants and animals and can play a critical role for endangered species. Habitat corridors allow movement between isolated populations, promoting increased genetic diversity. They provide food and shelter for a variety of wildlife and help with juvenile dispersal and seasonal migrations.

2.5 Open Space Flora and Fauna

Most non-native flora often have not co-evolved with insect and animal populations here in Connecticut, so they often have few to no natural predators, and are spreading virtually unchecked in our open spaces. The problem for native species of insects and animals is that these outsider plants are not recognized as food sources. Native insects such as bees and butterflies

generally rely on native plants for food and housing for the stages of their life cycles, including egg laying, larval hatching, nymph and adult phases. In turn, native birds and animals rely on native plant berries and native insects for their life cycles at various stages of development for their own nurture and chick fledging. Most non-native plants in the ecosystem represent areas void of resources for native Connecticut species. With ever greater acreage of land paved over for human purposes such as shopping areas, schools, roads and housing, birds and animals increasingly struggle to find enough habitat suitable to sustain adequate populations. Preservation of open space and the encouragement of native flora is critical to the success of the local native ecosystem.

2.6 Climate Change Impact on Open Space

Climate change is one of the most pressing challenges of our times. Climate change caused by global warming refers to major, long-term changes in temperature, precipitation, humidity, ocean heat, wind patterns, sea level, sea ice extent, ocean acidity, loss of natural habitats, species extinction and other factors, and how these changes affect life on Earth.

In southeastern Connecticut, the University of Connecticut's (UConn) Connecticut Institute for Resilience & Climate Adaptation (CIRCA) determined sea level has risen about 10 inches in New London over the last 80 years ([Ref 3](#)). Scientists at UConn recommend preparing for another 20 inches before 2050 ([Ref 4](#)). A 20-inch increase in sea level rise will result in portions of Jupiter Point, Groton Airport, Bluff Point, Groton Long Point, Willow Point and downtown Mystic to be underwater. Salt marshes will migrate inland, highlighting the importance of protecting land for this purpose. Tidal rivers will have higher levels of water and more extreme flooding. Temperatures are already rising in Connecticut, and are projected to increase on average about 2.8°C by 2050 ([Ref 5](#)). A warming atmosphere is already increasing the frequency and intensity of storms, causing coastal flooding and erosion as well as inland flooding threatening our homes, businesses, public infrastructure (e.g., roads, railroads, sewer pumping stations, wastewater treatments plants), forests and agriculture.

Preservation of ecosystems (e.g., forests, wetlands, vegetated coastal areas, tidal rivers, salt marshes, etc.) that may protect and mitigate impacts of climate change should be a priority for open space land acquisition.

2.7 Carbon Sequestration and Open Space Trees

As noted in the background information to section 2.6, increased carbon dioxide in the atmosphere is considered as the most significant reason for on-going climate change. Carbon dioxide can be eliminated from the atmosphere by the process of sequestration. The United States Department of Agriculture (USDA) Forest Service provides a significant amount of information on carbon sequestration in an effort to address climate change mitigation actions which can be found on their website ([Ref 6](#)), and provides this summary:

Carbon sequestration is the process by which atmospheric carbon dioxide is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils. The sink of carbon sequestration in forests and wood

products helps to offset sources of carbon dioxide to the atmosphere, such as deforestation, forest fires, and fossil fuel emissions. Sustainable forestry practices can increase the ability of forests to sequester atmospheric carbon while enhancing other ecosystem services, such as improved soil and water quality.

2.8 Availability of Open Space Throughout the Community

Scientists with USDA have addressed the topics of green space, human health and social justice in multiple papers in order to provide insights on the benefits and impact of open space ([Ref 7](#)). Their research has focused on the following areas of well-being in underserved communities:

- Green spaces like parks, urban forests, and greenways are often not equally available to everyone.
- Multiple studies found that parks and other public green spaces are often less available in neighborhoods with lower socioeconomic status or a high proportion of African American or Hispanic residents.
- Multiple studies document discriminatory zoning policies have led to social and economic segregation, which can contribute to environmental hazards such as pollution in low-income neighborhoods.
- Inequitable access to green space may be related to disparities in cardiovascular health, heat-related illness, obesity, and psychological well-being.
- Observations can vary by the quality, location, and type of green space, along with the health outcome. For example, it can be difficult to tell whether exposure to green space and its amenities improves health and well-being or if healthy people tend to seek out neighborhoods with these conditions.

The National Recreation and Park Association (NRPA) has identified five essential elements for public spaces to ensure social equality ([Ref 8](#)):

- **Accessibility** is perhaps the most important element of a small public space. A small park should be a central part of a community and should be encountered in the course of a normal day's routine. Locating parks on leftover parcels, private spaces or behind homes provides little relevance to their context or the overall community and can result in them being underutilized.
- **Specificity** means a site is specific to its location and users. It implies that a site possesses qualities that make it special and unique, and may come from a neighborhood's ethnic or religious affiliation.
- **Authenticity** means a park is genuine, or "the real deal," and must actually be the thing it is representing. Simply copying something successful from one area to another does not take into account a site's authenticity.
- **Adaptability** in a park allows for upgrades, maintenance and change over time as the neighborhood's needs evolve. Adaptability reflects the organic nature of public space.
- **Functionality** speaks to a park's place in the urban fabric and provides opportunities for play, recreation, retreat and socializing in practical ways by providing activities a community wants.

From an open space acquisition perspective, the Conservation Commission has determined, small areas can be just as important as large areas for improvement of underserved communities within the town. It has included addressing this consideration in the economic model discussed in section 5.

3.0 Open Space Priorities for Groton

3.1 Complete and Expand the Proposed Greenbelts

There are not many opportunities left in Groton to develop large "corridors" of connected open space in order to act as buffers for visual, auditory and migratory purposes. The current Town of Groton POCD ([Ref 9](#)) clearly outlines potential greenways from the proposed long-term greenbelt system. The POCD includes a recommendation to: Develop an action plan to establish, expand and connect greenbelts and state greenways – this plan outlines the details necessary to complete this recommendation.

The Conservation Commission believes execution of the POCD direction to establish greenbelts (potential greenways) is an overall benefit to Groton. The Commission developed mapping capability to utilize the various considerations noted in sections 3.2 through 3.7 below to integrate each into a unique layer. After subjective analysis the Commission determined that some changes to the original greenbelts could improve the overall performance of the network.

It is recognized there are multiple methods to provide for greenbelts including: open space procurement, working with property holders to place land into the Public Act (PA490) program, and establishment of conservation and/or recreation easements.

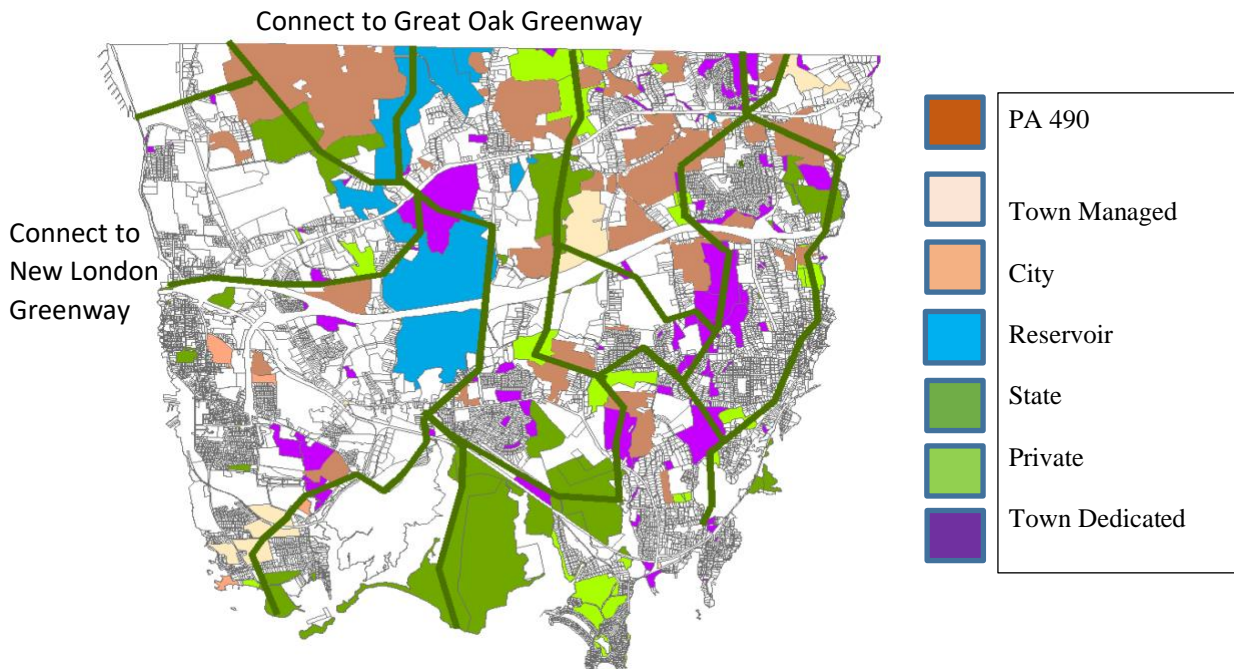


Figure 3-1 Proposed Greenbelt Expansion

3.2 Areas Significant to the Coast

The principal threat to Groton's remaining unprotected coastal lands with significant ecological or outdoor recreation value is residential development. If such development is not managed through regulatory review processes to protect these resources to the maximum extent possible, the habitats and recreational uses they support are diminished, sometimes irretrievably. Human encroachment and land disturbance within the coastal area has resulted in the loss or degradation of essential estuarine and coastal habitats. The extirpation or population declines of several species of plants and animals within the coastal area, with the consequent biological diminution of the region, can be attributed to many factors. But historically, destruction of natural habitats through dredging, filling, ditching, and draining of wetlands was associated with the construction of transportation infrastructure.

Connecticut's Coastal and Estuarine Land Conservation Program (CELCP) 2015 Plan ([Ref 10](#)) describes the State's coastal land conservation needs and prioritizes the types of coastal land acquisition opportunities that can be nominated for federal CELCP grant financing assistance.

While the entire land area of Groton falls within the CELCP Coastal Eco-Region Boundary planning area, the currently identified focus areas for the program only include some limited areas along our primary watersheds, due to the very high density of private development and extensive state parks along the Thames River, Long Island Sound, Fisher's Island Sound, and Mystic River.

One additional area of interest is the acquisition of inland and coastal flooding lands due to climate change, which is one the recommendations found in the Hazard Mitigation Plan Update Annex for the Town of Groton ([Ref 11](#)), prepared for the Southeastern Connecticut Council of Governments (SCCOG) Multi-Jurisdictional Hazard Mitigation Plan, and approved the Town Council. Specifically, the recommendations found in section 11 include: "When property owners become interested, pursue elevations or acquisitions of residential properties that suffer flood damage."

It is the intent of the Conservation Commission, not to include such acquisitions into this plan, as such situations would represent special circumstances. To fund this type of acquisition, other local area towns have pursued Federal Emergency Management Agency (FEMA) Hazard Mitigation Grants ([Ref 12](#)) which are directed towards the buyout of certain repetitive flood loss properties on the behalf of property owners.

Protection and maintenance of water quality and wetlands throughout the Groton coastal area through monitoring and zoning regulation are necessary to ensure the continued high value of this area to fish, wildlife and plant populations dependent on them.

Particular attention needs to be focused on restoring and protecting the water quality of the Thames River and its high value to fish and wildlife populations, especially anadromous fish and overwintering waterfowl. Protective measures should include stringent regulatory overview and enforcement of existing Federal, State and local environmental regulations, as well as developing and implementing environmentally sound planning and zoning policies and restoration programs.

One such example is the National Estuarine Research Reserve (NERR) ([Ref 13](#)) system of 29 designated United States wide coastal areas. The system is a partnership between the National Oceanic and Atmospheric Administration (NOAA) and the individual coastal states. Connecticut's NERR is approved, but as the newest it is still in the site standup process.

3.3 Natural Water Features and Drinking Water Resources

To support the section 1 objective of protecting surface and sub-surface water resources, this plan gives priority to the acquisition of lands that serve to protect high-quality natural water features and drinking water resources. Clean water, including in our rivers, lakes, and inland wetlands, are essential to life and provide some of the richest wildlife habitat in the state. Land conservation is an important part of watershed management for protecting habitat and water quality against impacts by fragmentation, climate change, runoff pollution, and other threats.

The highest quality streams exhibit the depth, volume, velocity, and variation of flow and water levels necessary to maintain habitat conditions supportive of an aquatic, biological community characteristic of that typically present in free-flowing stream systems. Protecting lands that buffer these most natural streams is vital to protecting this high-quality water resource. While not all streams will be classified as highest quality, there are many ecosystem benefits to protecting other high-quality natural water resources, such as headwater stream areas, recharge areas for groundwater aquifers, and floodplains. Development in these areas have the greatest impact on water quality and in-water habitat. Acquiring free-flowing watercourses, aquifer recharge areas, and floodplains will protect water quality by slowing runoff, trapping sediments, and reducing flood peaks. Protection of these ecologically sensitive areas also maintains habitat supportive of a diversity of fish and wildlife species.

The Zoning Regulations ([Ref 14](#)) section 6.4 establishes the town's Water Resource Protection District (WRPD) to ensure use regulation related to erosion and sediment control, stormwater management, site design and hazardous material with the district.

Groton Utilities, the potable water supplier for the majority of the town, as well as other local area water districts, is responsible for developing long term plans for maintaining the availability of high-quality drinking water for Groton. The Groton Utility's 2019 Annual Water Quality Report ([Ref 15](#)) states that in 2014, they invested funds to secure water rights from Haleys Brook in Groton and have advised local and state agencies to ensure that the immediate watershed area will receive protection status.

3.4 Woodlands and Carbon Sequestration

Preservation of native woodlands for carbon sequestration is a high priority. The first step in supporting this effort is to recognize woodlands identification within our ecological region. The Environmental Protection Agency (EPA) has classified all of Groton as part of New England (Region 1), Northeast Coastal Zone (Zone 59), Long Island Sound Coastal Lowland (Subregion 59g) ([Ref 16](#)). With this designation detailed habitat studies documented in the Long Island Sound Habitat Restoration Initiative Technical Support for Coastal Habitat Restoration Section 8 ([Ref 17](#)) were conducted. The studies identified the characteristics of our local forest, and provided detailed best practice management methods for preservation of local woodlands.

It should be noted that tree canopy is greater than the land considered as forested, as the canopy includes areas that have mixed use such as residential areas with streets, lawns and trees. Forested area by definition is a dense growth of trees and underbrush covering a large tract, of at least 2 acres. Over the past 30 years there has been an overall decline of the forest area of Groton as monitored by the University of Connecticut Center for Land Use Education and Research (CLEAR) Changing Landscape project ([Ref 18](#)). Development has resulted in the loss of over 7% of the forest in Groton as seen in landscape map which is available on the CLEAR Changing Landscape website interactive map, which has 30-year data comparison of as of 2015.

In response to this change of tree canopy across the state, DEEP has instituted an active urban forestry program ([Ref 19](#)). It recognizes that trees are a vital part of all cities and towns. Whether on public or private land, trees provide many benefits to a community including: aesthetic contributions, improved environmental quality and increased property values. For all of these reasons, many municipalities look to trees as a way to make life better in their city or town.

With the exception of trees in wetlands, trees on private property are usually not subject to the direct jurisdiction of the municipality. The Inland Wetlands and Watercourse Regulations ([Ref 20](#)) in section 4.1 addresses the controls in place related to clear cutting of timber (the removal of all trees greater than 2 inch diameter or greater than breast height, in a specified area). At the same time, trees in municipally-owned public spaces, such as along roads, in parks or adjacent to public schools, usually are the responsibility of the municipality. These public trees place financial and legal obligations on the community as a whole. These trees need to be cared for, with management costs involved and the need for plans and policies to guide their care. The urban forestry program goals include:

- increased percentage of urban forestry canopy cover,
- reduced numbers of unhealthy or unsafe trees,
- increased diversity within the tree population,
- more tree plantings in sections of town with proportionally less tree cover.

3.5 Preservation of Native Flora and Fauna

Preservation of native flora and fauna is important, and similar to the discussion of woodlands above. The same applicable EPA designation - Long Island Sound Coastal Lowland (Zone 59g) is utilized for studies to support cooperative efforts to protect and improve the health of the sound.

The Connecticut Geological and Natural History Survey (CGNHS) ([Ref 21](#)) is responsible for coordination and implementation of statewide natural resource data collection inventories in the following areas: surficial and bedrock geology, land cover, remote sensing; inventories of fauna and flora, including endangered species; and the development and operation of resource oriented data base management system.

No specific detailed studies have been conducted of Long Island and Fisher's Island Sounds for flora and fauna – rather the following coastal habitats, inclusive of the flora and fauna as well as wildlife, have been investigated by the Long Island Sound Study: Beaches and Dunes, Cliffs and

Bluffs, Estuarine Embayments, Freshwater Wetlands, Coastal Grasslands, Intertidal Flats, Rocky Intertidal Zones, Riverine Migratory Corridors, Submerged Aquatic Vegetation Beds, Shellfish Reefs, and Tidal Wetlands have been identified by the Long Island Sound Study of coastal habitats ([Ref 22](#)). Each of these areas can be found in Groton, and has its own unique and rare native plants (i.e. prickly-pear cactus, golden-aster, beach heather, swamp azalea, cat tail, eel grass and widgeon grass) that support the associated habitat's wildlife. Of note, the Conservation Commission has endorsed the Eastern Connecticut Conservation District's (ECCD) ([Ref 23](#)) grant request for the National Fish and Wildlife Foundation (NFWF) Long Island Sound Futures Fund 2020 ([Ref 24](#)) to protect and restore the health and living resources of Long Island and Fisher's Island Sounds.

Some of the plants and wildlife species, found in Groton are considered by the State of Connecticut to be: Endangered, Threatened or of Special Concern. The Natural Diversity Data Base (NDDB) map below shows general locations of known State and Federal Listed Species and Critical Habitats. Information on listed species is collected and compiled by the NDDB ([Ref 25](#)) from a variety of data sources. Exact locations of species have been buffered to produce the generalized locations. These generalized locations provide areas for future open space conservation efforts in Groton. It should be noted that acquisitions should not be targeted solely based upon this map, as additional biological research should be conducted to verify current habitats and species existence on any particular parcel.

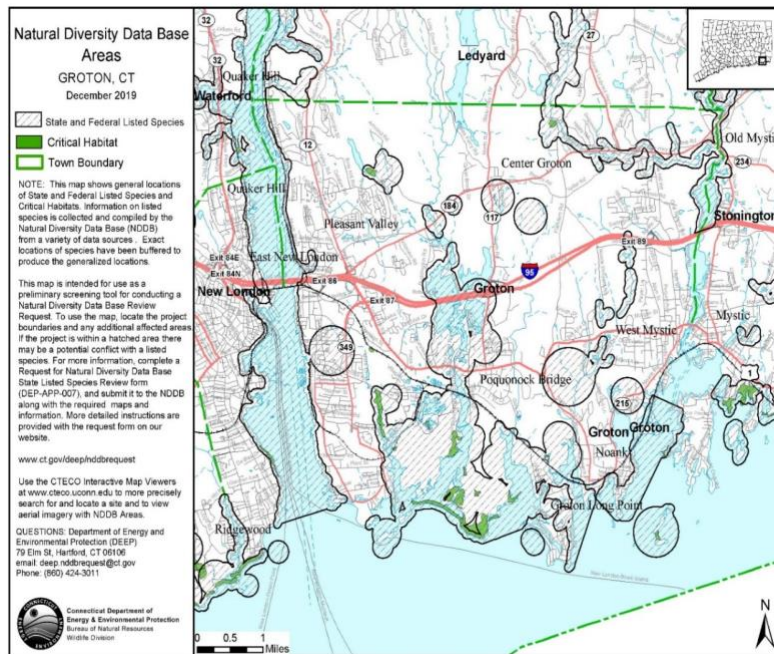


Figure 32 Natural Diversity Data Base Areas Groton Map

3.6 Natural Heritage Resources

Section 1 establishes the objectives for acquisition of lands that support important elements of the state's natural heritage, including State endangered and threatened species, critical habitats, unique or exemplary natural communities, significant geologic formations and Native American and historic heritage sites. Protecting land having important habitat and other natural features ensures the long-term survival of both rare and currently common native species. Moreover, investing in the protection of our natural heritage also ensures the public's ability to enjoy and benefit from these resources, such as through wildlife viewing and scientific study of environmental systems.

Groton's geologic landscape is characterized by its irregular coastline and the steeper slopes and rock outcroppings of its northern uplands. To geologists, Groton is part of the "Eastern Coastal Slope," an area of Southern New England once covered by loose sediments. Millions of years of erosion exposed the underlying bedrock of the Coastal Slope. This helps explain the rocky shoreline found in much of Connecticut, and Groton, and the ragged coastline. In addition, the protection afforded Connecticut's coastline by Long Island and Fisher's Island, a glacial terminal moraine, has preserved the jagged character of the Connecticut coastline. In contrast, nearby Rhode Island, Fisher's Island and Long Island have sandy barrier beaches created from years of storm activity picking up and depositing debris.

The surficial geology of Groton is a product of glaciation. The advance and retreat of glaciers eroded many of the river and stream valleys we know today, and deposited glacial till on the underlying bedrock. Some of the glacial till has eroded since the glacial period to expose bedrock in ledge outcroppings in upland areas and hilltops. The Town's surficial geologic formations include glacial till, stratified drift, and coastal formations. The majority of the town is underlain by glacial till. Till contains an unsorted mixture of clay, silt, sand, gravel, and boulders deposited by glaciers as a ground moraine. The exception is a vast area from Poheganut Reservoir and Smith Lake, extending south along the Poquonnock River and west through the airport which is underlain by stratified drift. Other minor stratified drift deposits are found along watercourses. The amount of stratified drift present is important as areas of stratified materials are generally coincident with floodplains. These materials were deposited at lower elevations by glacial streams, and these valleys were later inherited by the larger of our present-day streams and rivers. However, the smaller glacial till watercourses can also contribute to flooding.

Native Americans utilized the unique geology of Groton in development of stonework which is best exemplified at the Gungywamp site ([Ref 26](#)). Many other sites are located in Groton that include artifacts, etchings, petroglyphs, pottery, etc. are considered historical from various times including the Native American and colonial periods.

The Connecticut Office of Archeology and Connecticut State Museum of Natural History in 2009 identified the diversity of important cultural resources on the Groton Open Space Association (GOSA) Sheep Farm property. These resources included stone structures, old roadways, farming sites, Pequot Indian history encampments, flood control and 18th century industrial mill operations, and a scenic waterfall. The Town of Groton in 2019 endorsed GOSA's expansion of the Sheep Farm to the south. GOSA was awarded a DEEP Open Space and

Watershed Land Acquisition (OSWA) grant to support the associated land purchase in 2020, and is expected to complete full acquisition in early 2021.

3.7 Natural Resource-based Outdoor Recreation

The final priority supporting the objectives of section 1, the community wide availability issues raised in section 2 found in this plan, is to provide spaces where people of all ages, abilities, and socio-economic makeups have access to open space and opportunity to experience nature. It is important to ensure the public has adequate, equal opportunities to participate in wildlife-viewing, and other passive, natural-resource based outdoor activities on open spaces.

In the Town of Groton POCD ([Ref 9](#)) recreation uses within the town are defined as passive or active. Passive recreational facilities are areas that provide low impact recreation such as hiking or picnicking with minimal development or improvements. If improvements have been made, they typically include little more than park benches or picnic areas. Some passive recreation areas function as natural conservation areas and are generally left as natural, undeveloped open space. Active recreational facilities are defined as areas that accommodate organized sporting activities such as baseball, basketball, soccer, or tennis, or playscapes for children. Active recreational facilities have been further categorized by ownership as well as those associated with school facilities.

The Town of Groton Parks and Recreation Master Plan ([Ref 27](#)) outlines the inventory and plans for maintenance of over 1,575 acres of Town owned land dedicated to recreation for the public, along with the Bicycle, Pedestrian and Trails Master Plan ([Ref 28](#)), identifies many possible expansion opportunities (i.e. bike lanes, hiking trails, athletic fields, etc.).

Additionally, locations in both the City of Groton and Town of Groton along the Thames River are integral parts of the State of Connecticut Thames River Heritage Park, a unique state park without borders. More specific information about expansion of this park, and its possible future support of Greenbelt expansion and Greenway connectivity is available on their website ([Ref 29](#)).

5.0 Open Space Economic Value Analysis

This section of the Open Space Conservation Plan describes the economic model, developed by the Conservation Commission, to quantify the many ways in which open spaces can save the town money and supports its economy. It can be used to conduct a comparative analysis between open space proposals and open space versus development proposals. When combined with the qualitative benefits of open spaces noted in section 2, the information will allow Town Staff, Town Council members, Representatives to the Town Meeting and the general public to fully understand the economic, community, environmental and cultural impacts of a land use proposal from the viewpoint of the Conservation Commission.

The actual model is in electronic format, in multiple Microsoft EXCEL spreadsheets incorporated into a single workbook. Operating details are available in the Open Space Economic Model User Manual and Supporting Data dated April 2020 ([Ref 30](#)), which is available through contact with the Office of Planning and Development Services Staff.

If an example of a commercial property is desired, the model will support this, and the Conservation Commission can be contacted for details.

The Conservation Commission successfully utilized the model in 2019 during deliberations in responding to requests for assessment of various parcels relative to future utilization as open space, such as the redevelopment proposal of the Seely School, and future use of the Noank School.

6.0 Open Space Methodologies

The Conservation Commission recognizes that multiple actions are required by the commission to effectively implement a pro-active conservation program within the town. The below methods will be utilized to bring the recommendations of this plan to fruition.

6.1 Supporting Connecticut State Open Space

The State of Connecticut DEEP has established a goal to protect 673,210 acres or 21% of Connecticut's land as open space by the year 2023. Ten percent of this open space is to be DEEP-owned as State parks, forests, and wildlife areas. The other 11% is to be owned by towns, private non-profit land conservation organizations, water companies, and the federal government. In support of this goal, DEEP issued Connecticut's comprehensive open space acquisition strategy known as "The Green Plan" ([Ref 31](#)). Open Space land considered under the state's plan must be specifically preserved or protected for open space use. These lands include DEEP's State Parks, State Forests, Wildlife Areas and Class I and II watershed lands, as well as lands subject to conservation restrictions, deed restrictions or reserved rights.

While the state's open space goals do not apply to individual towns, if this criterion were applied to Groton, the following assessment of open space lands meeting DEEP's criteria is possible:

Total land covered by Town of Groton (includes all 10,463 owned parcels and roadways) is: 20,377 acres or 31.83 sq miles. Note: the total land and water acreage (i.e. including the Thames and Mystic Rivers, and Long Island and Fisher's Island Sounds areas) of the Town of Groton is: 28,992 acres or 45.3 sq miles.

Total State-owned Open Space in Groton: 1,541 acres (7.6%)

Total Municipal Open Space in Groton: 2,469 acres (12.1%)

Total Private Open Space in Groton: 466 acres (2.3%)

Total Open Space in Groton: 4,477 (21.9%)

From this result, Town of Groton is overall comparable to the DEEP total statewide goal for open space acreage – but has a lower than expected state percentage contribution.

While Groton's open space percentage closely matches the overall state-wide goal, supporting an enhanced quality of life here in Groton, in order to offset over-development and excess

urbanization in other Connecticut towns, we strongly recommend higher percentages than the state goal. Significant other considerations for establishment of specific open space acquisition targets are necessary to meet the objectives and priorities established by this plan. Groton still has many opportunities for protection of vacant land in order to protect and preserve it for the benefit of all citizens, through mitigation of climate change, ensuring better water quality, improving carbon sequestration, providing wildlife habitat and improving access for outdoors recreation opportunities. The Conservation Commission notes that multiple recommendations in section 3 promote additional open space land acquisitions by the Town.

6.2 Future Open Space Acquisition Targets

As noted in section 2 of the Town of Groton POCD ([Ref 9](#)), Methods of Protection, a more comprehensive plan for open space protection is needed for the town. This Open Space Conservation Plan for Groton addresses the specific recommendation to identify and prioritize desirable parcels for the town, private organizations or individuals to acquire or designate as restricted open space in order to better meet the overall conservation objectives of the Town. Additionally, specific parcel areas were identified by the Conservation Commission in January 2013, as part of the Town of Groton POCD development.

6.3 Funding Open Space Acquisition

The Town of Groton 2016 POCD ([Ref 9](#)) finding 2-5 recommended establishment of funding open space acquisition in the Capital Improvement Program (CIP). The FYE2020 Budget ([Ref 32](#)) established in the Six Year CIP item 8-B, with funding starting in FYE2022. Subsequently, the CIP item was updated for FYE 2021 as follows:

The Conservation Commission and the Planning Commission through the Plan of Conservation and Development have identified a number of parcels of land that would be worthy of acquisition as Town open space. This would allow the Town to protect natural resources, make trail connections, allow for marsh advancement due to climate change, and fill gaps in and around existing open space. Funds from this project were most recently used to leverage the purchase of the Sparkle Lake Conservation Area on Thomas Road by applying them to the required 25% match for a State Open Space and Watershed Land Acquisition (OSWA) grant. Connecting our open space resources creates more recreation opportunities, contributes to a higher quality of life and will benefit the economy.

This plan will provide the framework for future decision that will be funded by CIP item 8-B. Continuing Conservation Commission and public support will be required to ensure the long-term objectives are consistently funded by this effort, are not stopped or redirected by short term budget decisions done by the Town Manager, Town Council and Representative Town Meeting members. The Conservation Commission recognizes how hard budget priority decisions are, but also that consistent long-term planning is necessary to achieve the objectives for improved benefits for the entire community that expansion and maintenance of open space provides.

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