

# RIVERHEAD

## Comprehensive Plan Update



## Chapter 12: Natural Features and Environmental Resources

*Working Draft*

This document is presented in its current form as a preliminary draft for public review. We encourage all stakeholders to provide comments as your input will play a vital role in shaping the final version of the Comprehensive Plan. Please email comments to [compplan@townofriverheadny.gov](mailto:compplan@townofriverheadny.gov).

Please note that the document will be further refined once comments are received from the community. Since it is an interim document, it is in a raw formatted form. The revised draft will be arranged in a more graphic format with photos, figures, and other visual elements to enhance clarity and understanding. Thank you for your time and participation in this important planning process.

*Submitted by BFJ Planning*

*February 8, 2024*

## Introduction

---

This section explores the diverse natural elements that shape Riverhead, addressing key environmental resources and strategies to preserve and enhance our unique ecosystem for the benefit of current and future generations

Riverhead occupies a unique place within the much-admired landscape of eastern Long Island. Riverhead lies literally "at the head of a river" — the Peconic — Suffolk County's largest. The Town also serves as the geographic bridge between the north and south forks of the East End, lying at the juncture of these two landforms, with the Peconic River serving as the lynchpin.. The fact that the community derives its name from a major natural feature shows how much that natural environment shapes the Town's identity.

Riverhead is a coastal community bounded by water on much of its perimeter. In addition to its waterfront along the Peconic Estuary system (which includes the Peconic River, Flanders Bay, and the Great Peconic Bay), Riverhead is bounded to the north by Long Island Sound. Many of the shoreline and coastal areas in Riverhead are scenic — particularly the Sound waterfront, with its picturesque bluffs — and all of them have distinctive plant and animal communities. The Town is an agricultural community where natural resources play an essential role in the livelihood of residents, property owners, and businesspeople.

In all these ways, the natural environment shapes the way of life in Riverhead. Through the Comprehensive Plan, Riverhead has an opportunity to plan for new development in such a way that the natural environment can be better preserved. The condition and quality of natural resources not only affect public health and safety but play a significant role in the local economy. The conscientious stewardship of these resources not only safeguards public health and safety but also stands as a pillar supporting the local economy, exemplified by the interdependence of the agricultural sector on the Town's water and soil resources for sustained business vitality.

## Existing Conditions

---

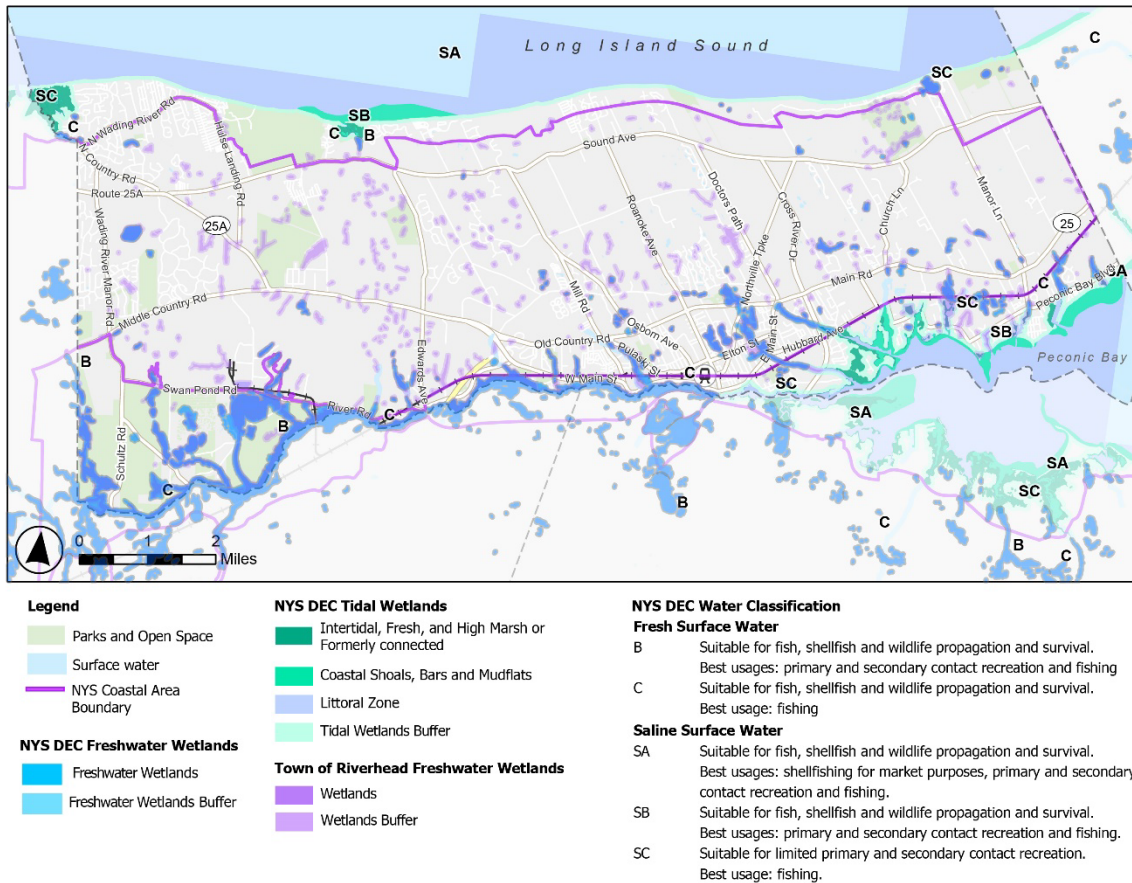
### Surface Waters

---

Riverhead boasts unique and vital water resources, including the Long Island Sound and Peconic Estuary, utilized for fishing and diverse recreational activities such as canoeing, kayaking, sailing, and swimming. Preservation of these surface waters, along with non-coastal surface waters, rivers, ponds, and streams, is imperative to safeguard the fishing and tourism sectors. Equally crucial are the underground water aquifers, necessitating protection of recharge areas to sustain the numerous public and private wells vital for the community's drinking water.

These water resources play a pivotal role in Riverhead's economy, supporting local fishermen and attracting tourists to the scenic waterfront areas for water sports, hiking, biking, and other leisure activities. The tourism industry relies on the allure of the town's water bodies, influencing residential property values, particularly in coastal areas. However, the delicate ecological balance of these areas is vulnerable to human activities, emphasizing the need for sensitive planning to prevent adverse impacts on water quality. Additionally, the rich biodiversity of the town's water bodies, including freshwater and tidal wetlands, serves as essential habitat for distinct plant and animal populations, underscoring the interconnectedness of environmental preservation and community well-being.

Figure 1. Surface Waters, Wetlands, and Coastal Area Boundary



Sources: Town of Riverhead, NYS DEC; NYS GIS, USGS, BFJ Planning

### New York Protection of Waters Program

Under the Environmental Conservation Law, DEC regulates activities within water resources, including rivers, streams, lakes, and ponds. These resources provide essential ecological functions, recreation, aesthetic, and economic value while also contributing to the quality and supply of drinking water. Waters are classified based on their best use (see Figure 1). Regulations vary depending on the classification of the water, surface area, segment length, type (e.g., protected streams), buffer areas and banks, and the proposed project or action.

### Long Island Sound

The Long Island Sound, spanning approximately 1,320 square miles with 600 miles of coastline, serves as a vital economic and ecological hub.<sup>1</sup> The Sound's impact on the regional economy, generating over \$15 billion annually, underscores its significance in supporting diverse activities, contingent upon the quality of its waters, living resources, and habitats. As a crucial component of the north shore communities, including Riverhead, the Sound's health and visual character are intrinsically linked to the well-being of these localities. The estuarine nature of the Sound, blending

<sup>1</sup> Long Island Sound Study, <https://longislandsoundstudy.net/>

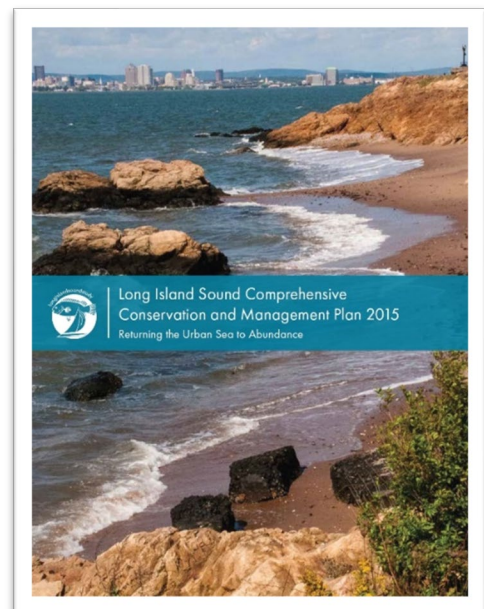
fresh and saltwater, fosters a rich ecosystem supporting fish, shellfish, waterfowl, and various plant species, playing a vital role in commercial and recreational fisheries and shellfisheries, educational opportunities, migratory bird habitats, habitats for endangered species, such as the northern long-eared bat and tiger salamander, and coastal wetland functions.

### Long Island Sound Study (LISS)

Designated as an "Estuary of National Significance" in 1987 under the National Estuary Program (NEP), the Long Island Sound garnered formal recognition in 1985 with the establishment of the Long Island Sound Study (LISS). LISS is a partnership between the U.S. Environmental Protection Agency (EPA), Connecticut, and New York and includes representatives from agencies at all levels of government, non-profits, commercial entities, educational institutions, and community organizations. This cooperative effort has been pivotal in addressing and rectifying the Sound's most pressing environmental challenges, reflecting the shared commitment of citizens and government toward its preservation and sustainable management. In 1994, LISS published the Long Island Sound Comprehensive Conservation and Management Plan, which outlined actions to improve the quality and health of the waters and habitats of Long Island Sound.

In 2015, LISS revised the Comprehensive Management Plan with targets through 2035. The Plan includes measurable implementation actions in five-year periods.<sup>2</sup> The update places emphasis on actionable targets to achieve four thematic primary goals:

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



---

<sup>2</sup> Long Island Sound Comprehensive Conservation and Management Plan 2015, [2015 Comprehensive Conservation and Management Plan - Long Island Sound Study](#)

CCMP Implementation Actions 2020-2024 Update, [CCMP Implementation Actions 2020-2024 Update - Long Island Sound Study](#)

### The Peconic Estuary

The Peconic Estuary system, stretching from the Peconic River mouth to the Atlantic Ocean, encompasses over 100 distinct bays, harbors, embayments, creeks, and tributaries within its defined study area. Covering more than 158,000 surface water acres and 125,000 land acres, this vital ecosystem supports a year-round population of over 100,000, surging significantly during the summer months. Riverhead, situated at the estuary's western end, is intricately linked to this system, which includes Flanders Bay and the Peconic River mouth. The Peconic River, teeming with diverse plant and animal life both in its waters and along its banks, boasts an 800-acre undisturbed salt marsh complex serving as a critical nursery for marine life.

Despite generally high-water quality, the Peconic Estuary faces challenges from increased development pressure and land use changes, leading to water quality degradation and habitat loss, particularly in the system's western end near Riverhead. This vulnerability is attributed to inadequate water flushing compared to eastern waters. Recognized as an "Estuary of National Significance" in the National Estuary Program (NEP) since 1992, administered by the U.S. Environmental Protection Agency (EPA), the Peconic Estuary is actively managed through the Peconic Estuary Program (PEP) and the Peconic Estuary Partnership (PEP).

### Peconic Estuary Partnership (PEP)

The PEP was established in 1992 and has brought over \$13 million of federal grant money to the Peconic Estuary Watershed. The PEP has accomplished water quality improvement, habitat improvement, land protection, climate adaptation, and monitoring. They provide monitoring, research, education, and collaboration to protect and restore the Peconic Estuary and Watershed.

### Peconic Estuary Comprehensive Conservation Management Plan

The Peconic Estuary Partnership (PEP)'s *2020 Comprehensive Conservation and Management Plan* (CCMP) is a strategic framework for protecting and restoring the Peconic Estuary of eastern Long Island.<sup>3</sup> The 250-square mile estuary comprises Great Peconic Bay, Little Peconic Bay, Gardiners Bay, and a hundred other bays, harbors, and tributaries. Altogether, the estuary's shoreline totals more than 450 miles. The Peconic Estuary watershed includes the Towns of Brookhaven, East Hampton, Southampton, Riverhead, Southold, and Shelter Island.

The CCMP includes several recommendations relevant to this comprehensive planning effort, including the following:

- Enhance PEP's organizational structure, operational practices, and financial positions to support successful implementation the Plan. Empower local communities to support estuary health, including underrepresented groups.
- Help local communities take meaningful, well-informed action to prepare for and adapt to climate change impacts; identify and prioritize sustainable projects; conserve and protect habitats; acquire tools and databases related to goals; protect and restore coastal ecosystems; and collaborate on coastal and ocean acidification monitoring and research.
- Protect areas from degradation by identifying water quality in ground and surface waters.

---

3

Communicate with local governments to increase understanding of negative impacts from legacy, current, and future nutrient inputs.

- Expand scientific understanding of the Peconic Estuary ecosystem and deliver information that supports management decision-making.
- Restore and protect key habitats and watershed biodiversity.

### **Peconic Riverfront Zoning**

Riverhead has integrated the protection of the Peconic waterfront into several zoning districts. For example, both the Riverfront Corridor (RFC) and the Peconic River Community (PRC) districts are intended to provide a mix of residential, commercial, and recreational uses that harmonize with the Peconic River's natural habitat and ecologically sensitive areas. The PRC district is slightly different and was amended to be compatible with the regulations of the Wild, Scenic and Recreational Rivers (WSRR) designation for that area, which is discussed further below. The Downtown Center 2 Waterfront (DC-2) Zoning Use District's purpose is to create a downtown waterfront area that meets the combined goals of continuous pathways and public waterfront access, generous open space and landscaping, and watershed protection through limits on impervious surfaces. The Natural Resources Protection (NRP) district restricts development to compatible agricultural, single family, or recreational uses in the Pine Barrens area.

### **New York Wild, Scenic and Recreational Rivers Program**

New York's Wild Scenic and Recreational Rivers Act protects rivers with outstanding scenic, ecological, recreational, historic, and scientific values derived from fish, wildlife, and botanical resources, aesthetic quality, archaeological significance, and other features. Rivers should be preserved in free-flowing conditions and protected from overdevelopment and improper use to ensure future generations enjoy the rivers' benefits.

DEC has designated portions of the Peconic River in Riverhead as "scenic," "recreational," and "community" rivers. These areas are regulated by DEC, and specific activities (e.g. construction of new structures, subdividing land, cutting vegetation) will trigger the need for a Wild, Scenic, and Recreational River Permit.

### **Wetlands**

#### **Freshwater Wetlands**

Freshwater wetlands are found throughout Riverhead, especially along the Peconic River and in the Pine Barrens Preserve (See Figure 1). The Significant Habitats section below describes some of the most significant freshwater wetlands in more detail. Freshwater wetlands provide essential benefits to the ecosystem, including plant and animal habitats, flood protection and mitigation, educational and research opportunities, and aesthetic beauty.

DEC regulates freshwater wetlands through the Freshwater Wetlands Act of the Environmental Conservation Law. Regulations protect wetlands larger than 12.4 acres and 100-foot buffer areas. In some cases, significantly smaller wetlands are also protected by the State. DEC regulates the use of wetlands, particularly filling and draining, and requires wetlands permits for projects within or near

wetlands and provisions to avoid or mitigate the consequences of the project on the wetlands. Local governments are authorized to add additional protections to wetland areas. Chapter 295 of Riverhead's Town Code outlines regulations and permitting requirements.

New York State has adopted changes to its freshwater wetlands law that will begin to take effect in 2025. The current wetlands maps will no longer be used for regulatory purposes and maps will only be provided for informational use. DEC is currently working closely with Cornell University to map wetlands more accurately and classify wetlands based on several factors, including whether they are in urban areas, in floodways, contain rare plants, provide habitats for the essential behavior of Endangered/threatened/special concern species, and other criteria. As of 2028, the state will regulate wetlands of 7.4 acres or greater in addition to wetlands of special significance. Until 2028, the 12.4 acre threshold remains in place.

### **Tidal Wetlands**

Tidal wetlands line the shore, bays inlets, and estuaries of the Long Island Sound and Peconic Bay in Riverhead (see Figure 1). Some significant areas include the Wading River Marsh Preserve adjacent to the Wading River Beach and Indian Island County Park on Flanders Bay. Tidal wetlands are irreplaceable resources that provide wildlife habitat, fish and shellfish production, flood and storm protection, and cleansing of ecosystems, among other benefits.

The Tidal Wetlands Act aims to preserve and protect habitats and enhance their ecological and other values by regulating activities within tidal wetlands and a buffer area around them. The regulations categorize wetlands based on the presence of tides and types of vegetation. DEC tidal wetlands regulations apply anywhere tidal inundation occurs regularly, including within the salt wedge<sup>4</sup>. A 300-foot landward buffer around tidal wetlands is also regulated by DEC.

### **Coastal Erosion Hazard Areas**

New York State's Coastal Zone Management Act and Program mandates regulations on activities in coastal areas. Chapter 219 of Riverhead's Town Code outlines these regulations, including restrictions for nearshore areas, beaches, dunes, bluffs, and erosion protection measures. The Coastal Area Boundary established by the State is depicted in Figure 1.

### **Groundwater Resources**

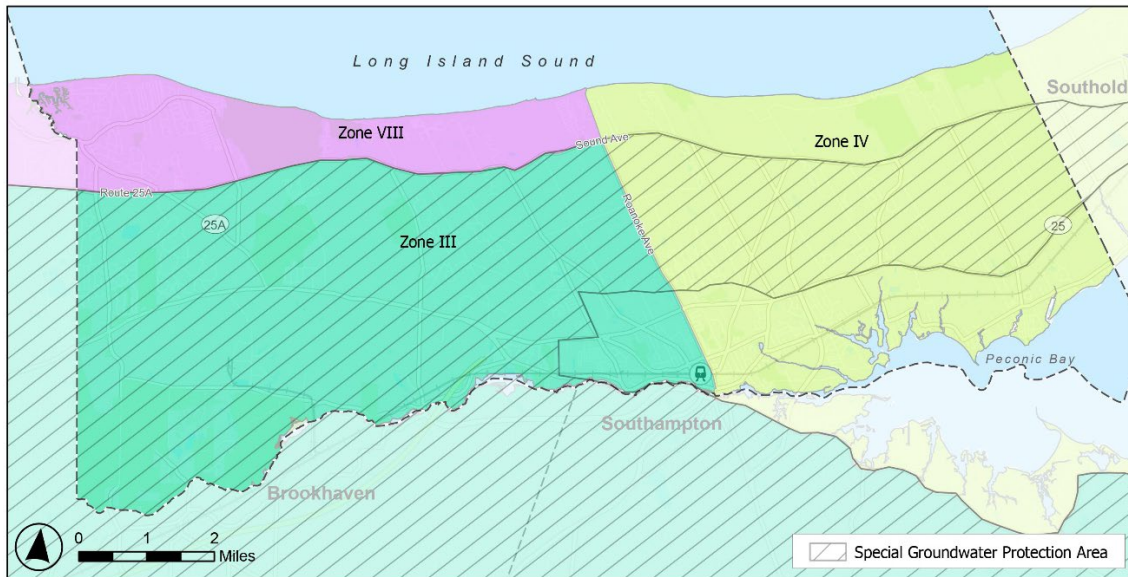
The Groundwater Management Zone (GMZ) system in Riverhead, as defined by Article 7 of the Suffolk County Sanitary Code. GMZs or hydrogeological zones correspond with the type of aquifer that lies beneath the surface and the characteristics and groundwater quality in each zone. Three GMZs cover Riverhead (see Figure 2). Zone III is a deep recharge area that extends to Sound Avenue on the north and Roanoke Avenue on the west. It includes the Core Preservation and Compatible Growth Areas of the Pine Barrens. A good portion of Zone III is undeveloped. It contains high-quality groundwater in the upper glacial, Magothy, and Llyod aquifers. Zone IV extends east of Roanoke Avenue to the Southold town line and has characteristically shallow flow systems that discharge to streams and marine waters. Zone VIII is located west of Roanoke Avenue and extends north to the

<sup>4</sup> A salt wedge is the area in an estuary where freshwater and saltwater meet. Because of the difference in densities, freshwater will float above the denser saltwater which will form a wedge-like mass beneath it. As tides ebb and flow in the estuary and weather conditions change, the location of the wedge will move.



Long Island Sound from Sound Avenue. Groundwater in Zone VIII flows towards the Long Island Sound.

Figure 2. Groundwater Management and Protection



Sources: Suffolk County, NY DEC, NYS GIS, Town of Riverhead, USGS, BFJ Planning

### Suffolk County Special Groundwater Protection Area

Figure 2 shows the Central Suffolk Special Groundwater Protection Area (SGPA) boundaries in Riverhead. Article 55, Sole Source Aquifer Protection, of the New York State Environmental Conservation Law seeks to protect designated sole source aquifers and prevent contamination of high-quality groundwater. Article 55 sets forth an ambitious program of groundwater protection requirements, including preparing a comprehensive management plan. The requirements generally seek to identify all known existing and potential point and non-point sources of groundwater degradation and to develop specific watershed rules and regulations.

### Watershed and Water Resources Management

#### Riverhead Watershed Management Program

The Town's watershed management programs focus on promoting sustainable practices for the protection and enhancement of water quality, the sustainability of water resources, and the preservation of natural ecosystems. This involves strategies such as land preservation, wetland restoration, regulations to reduce pollutant loads, and infrastructure tools to minimize the impact of stormwater discharge. Collaborating with farmers and landowners, the Town implements conservation practices like reducing fertilizer and pesticide use, planting cover crops, and improving soil health to mitigate runoff and safeguard water quality, with support from organizations such as The Nature Conservancy. A key facet of the program lies in identifying and safeguarding critical water resources, encompassing wetlands, streams, and other aquatic ecosystems. Additionally, the Town's watershed management program incorporates ongoing monitoring and assessment of water

quality to ensure the continued protection of water resources and identify potential threats to water quality.

### **Suffolk County Comprehensive Water Resources Management Plan (2015)**

This Plan provides an analysis of the water quality, quantity, availability, and challenges faced by Suffolk County, including Riverhead. The Water Resources Management Plan sets goals in four significant categories: groundwater resource management, drinking water supply, surface water resource management, and wastewater management.

### **Suffolk County Subwatersheds Wastewater Plan**

The Suffolk County Subwatersheds Wastewater Plan (SWP) (July 2020) was developed in response to the Comprehensive Water Resources Management Plan as part of the Reclaim Our Water initiative. Wastewater management options and recommendations explored in the SWP include connection of parcels to community sewers by expanding existing sewer districts or creating new sewer districts where possible, upgrading cesspools or conventional onsite sewage disposal systems to Innovative and Alternative Onsite Wastewater Treatment Systems (I/A OWTS), and requiring nitrogen reducing technology on all new construction countywide. The Subwatersheds Wastewater Plan indicates where nitrogen loads originate and how to minimize loadings and provides parcel-level recommendations for land preservation.

## **Significant Habitats**

---

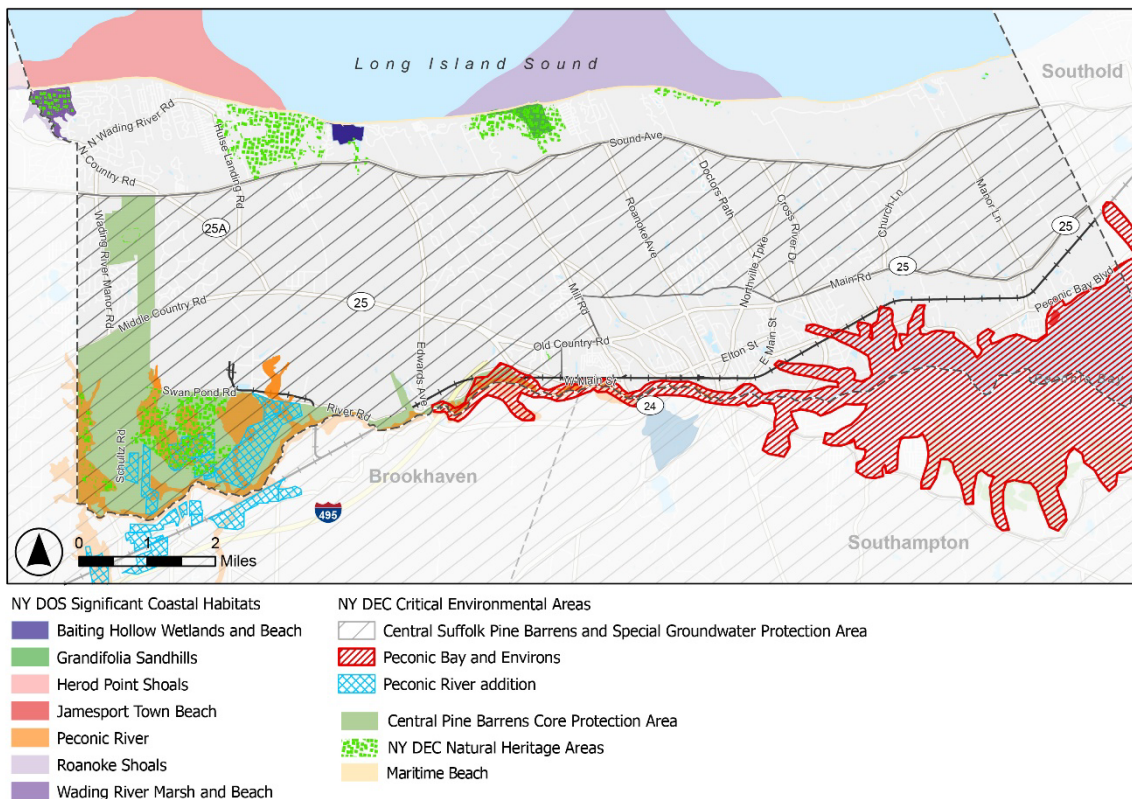
Riverhead's natural environment includes various unique and highly productive ecosystems, some aquatic and some terrestrial. These ecosystems support diverse living species, including microscopic plants and animals, seaweed, fish and shellfish, crustaceans, birds, sea turtles, marine mammals, trees, flowering plants, insects, amphibians, such as the endangered tiger salamander, and mammals, including the endangered northern long eared bat. As part of the Peconic Region, Riverhead encompasses the Peconic Estuary watershed, contributing to one of the state's highest concentrations of rare plants and animals, including federally endangered shorebirds like the Piping Plover and the Roseate Tern found on regional beaches. Native species, integral components of ecological communities in woodlands, meadows, and wetlands, play a vital role in sustaining Riverhead's natural heritage, offering essential habitat and contributing to the region's environmental functions.

The interconnectedness of these communities forms a complex web of relationships involving food, water, and shelter, emphasizing the importance of protecting broader habitats when specific species are endangered or threatened. The safeguarding of native plants and animals promotes ecological diversity and sustainability, contributing to the community's scenic, educational, and scientific values. Additionally, native plants act as natural filters, purifying water that enters aquifers and water bodies, while their roots help mitigate excess water during storms and flooding, reducing the potential for groundwater contamination and risks to life and property. However, agricultural and landscaping practices may introduce invasive species that pose a threat to the delicate balance of native ecosystems, as their seeds can be easily transferred by wind, water, birds, or insects.

### New York Significant Coastal Habitats

The New York Department of State (DOS) designates Significant Coastal Fish and Wildlife Habitat sites (see Figure 2). The DOS website provides site-specific information and a narrative about each habitat's essential characteristics to assist in evaluating the environmental impacts of proposed activities. Coastal habitats range from marshes, wetlands, mud and sandflats, beaches, rocky shores, riverine wetlands and riparian corridors, stream, bay, and harbor bottoms, creeks submerged aquatic vegetation beds, dunes, old fields, grasslands, and woodlands and forests.

Figure 3. Significant Habitats



Sources: NY DOS, NY DEC, Town of Riverhead, NYS GIS, USGS, BFJ Planning

### New York Natural Heritage Areas

Under the Environmental Conservation Law, the New York Natural Heritage Areas Program defines Significant Natural Communities as locations with “rare or high-quality wetlands, forests, grasslands, ponds, streams, and other types of habitats, ecosystems, and ecological areas.” Figure 3 shows the communities identified and tracked by the New York Natural Heritage Program.

DEC has an Endangered Species Program to track endangered and threatened species in New York State. Natural Heritage Areas and their vicinity are habitats of endangered and threatened species. Some of the significant natural communities in Riverhead are described below.

### **Calverton Ponds Preserve**

The Calverton Ponds Preserve, a 350-acre assemblage of pine barrens and coastal plain ponds, is an irreplaceable natural resource and is one of the rarest wetland ecosystems in the State. The Nature Conservancy and Suffolk County Parks cooperatively own and manage the preserve.

### **Coastal Oak Beech Woodlands**

An important woodland area in Riverhead is the old-growth Coastal Oak Beech woodland found along the moraine that forms the Long Island shoreline. Rare Dwarf Beech woodlands are found in certain areas along the escarpment, such as Friar's Head and Wildwood State Park. The New York Natural Heritage Program has noted that this is the largest maritime beech forest in New York and one of three located along the East Coast. Beech Leaf Disease is a prevalent threat to these rare woodlands.

### **Central Pine Barrens**

Encompassing over 105,000 acres across Riverhead, Brookhaven, and Southampton towns, the Central Pine Barrens region (see Figure 2) is hailed as Long Island's paramount wilderness, playing a critical role in safeguarding the federally designated sole-source aquifer. Today, the region stands as a complex and interconnected ecosystem, blending surface and groundwater systems, terrestrial and aquatic habitats, farmlands, and residential communities. Its significance extends to the watershed and headwaters of the Peconic River, overlapping with the Peconic Estuary and the proximity to the Long Island Sound and Atlantic Ocean, fostering a unique climate and biodiversity. Recognized for its globally rare dwarf pine plains, the region hosts diverse flora and fauna, including the pitch pine tree species, oak varieties, and wetland plants found exclusively on Long Island. Regular wildfires, intrinsic to the Pine Barrens, play a pivotal role in nutrient release, triggering new growth and maintaining the balance of the ecosystem, providing vital habitats for animal communities, and serving as breeding grounds for migratory birds, such as the bobwhite quail and the eastern tiger salamander.

Situated above Long Island's federally designated sole-source drinking water aquifer system, the Pine Barrens' porous soils facilitate groundwater recharge through deep flow recharge. This aquifer, crucial for Long Island residents' clean drinking water, is susceptible to contamination due to the soil's high permeability, which hampers its ability to filter contaminants effectively. Recognizing the Central Pine Barrens' importance, various laws and policies at the County, State, and federal levels have been enacted to shield it from the adverse impacts of development. Much of the land within the region has been preserved through acquisitions by entities such as New York State, Suffolk County, Towns, and non-profit organizations, reflecting a collective commitment to its enduring protection.

### **Central Pine Barrens Commission and Comprehensive Land Use Plan**

Established in 1993, the Central Pine Barrens Commission operates under the mandate of the Long Island Pine Barrens Protection Act, requiring the development of a Comprehensive Land Use Plan

with a five-year review cycle. The inaugural Comprehensive Land Use Plan (CLUP) was crafted in 1995, and proposed amendments to chapters 4-6 are anticipated for adoption in 2024.<sup>5</sup>

The CLUP identifies two regions within the Central Pine Barrens — the Core Preservation Area and the Compatible Growth Area. The Core Preservation Area consists of 55,000 acres (4,720 in Riverhead), in which all new development is essentially prohibited, with limited expansion of existing agricultural uses being permitted. The Compatible Growth Area consists of 47,500 acres (5,484 in Riverhead), in which appropriate patterns of compatible residential, commercial, agricultural, and industrial development are permitted. Figure 4 illustrates the boundaries of the Core Preservation and Compatible Growth Areas. The Calverton redevelopment policy under section 9.2 of the CLUP recognizes that economic development on the former Calverton Naval Industrial Reserve Plant property, known as EPCAL, is considered a public improvement and is not considered “development” as defined in the Pine Barrens Protection Act. This policy effectively exempts the area from additional restrictions on development that are otherwise imposed on areas within the core preservation area by the Act.

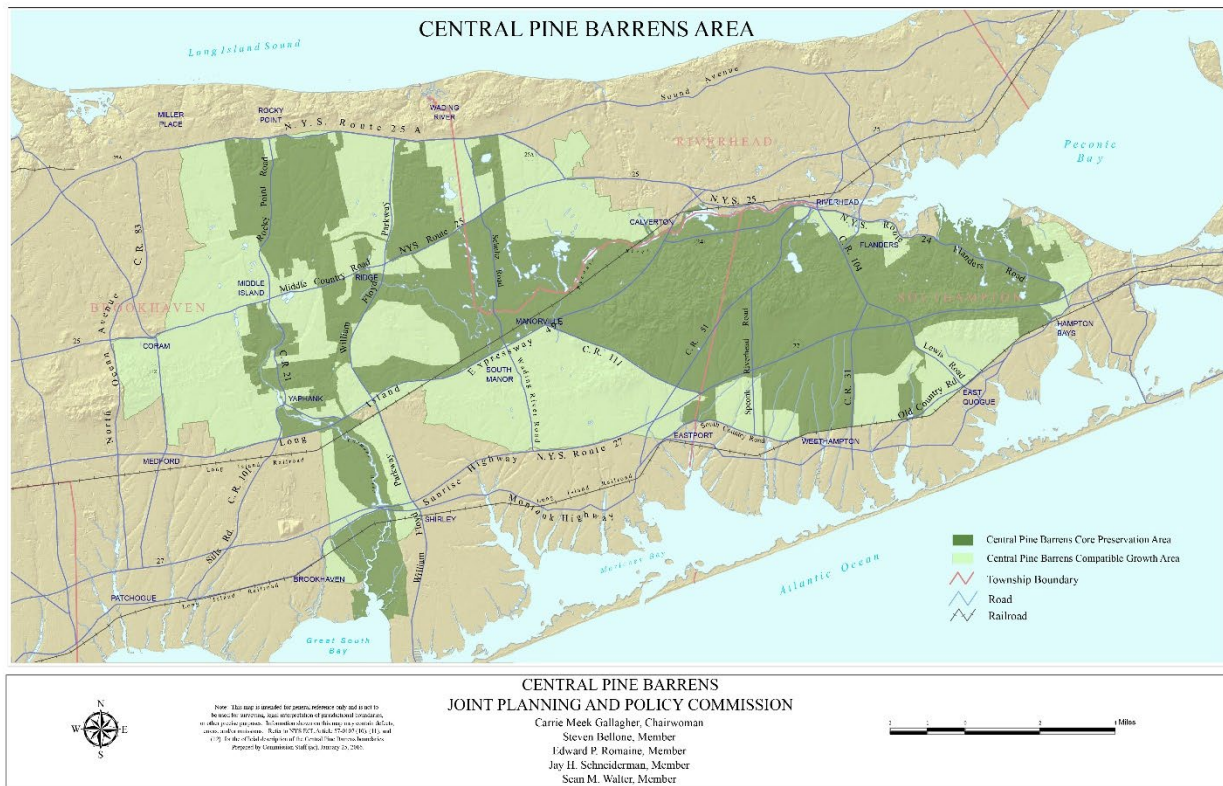
The Plan includes a strategy for the public acquisition of private vacant property in the Core Preservation Area, with a goal of purchasing 75 percent of the remaining privately owned vacant land. To this end, a type of development rights transfer program called the Pine Barrens Credit (PBC) Program has been created. Property owners in the Core Preservation Area may transfer the right to develop a parcel in the Core to another parcel outside the Pine Barrens region.

It is important to note that the Pine Barren’s Preservation Incentive Program does not compete with Riverhead’s TDR Program. Pine Barren Credits allow for the purchase of additional sanitary credits. TDR’s increase allowable development through increases in dwelling units or FAR. Sometimes, these two programs can be used in conjunction with each other.

---

<sup>5</sup> Central Pine Barrens Joint Planning & Policy Commission, Central Pine Barrens Comprehensive Land Use Plan, <https://pb.state.ny.us/public-information/comprehensive-land-use-plan/>

Figure 4. Central Pine Barrens Core Preservation Area and Compatible Growth Area



Source: Central Pine Barrens Joint Planning and Policy Commission

## Topography and Soils

The characteristics of landforms determine those areas best suited for agricultural use and areas unsuitable for development, such as steep slopes and eroding bluffs.

### Topography

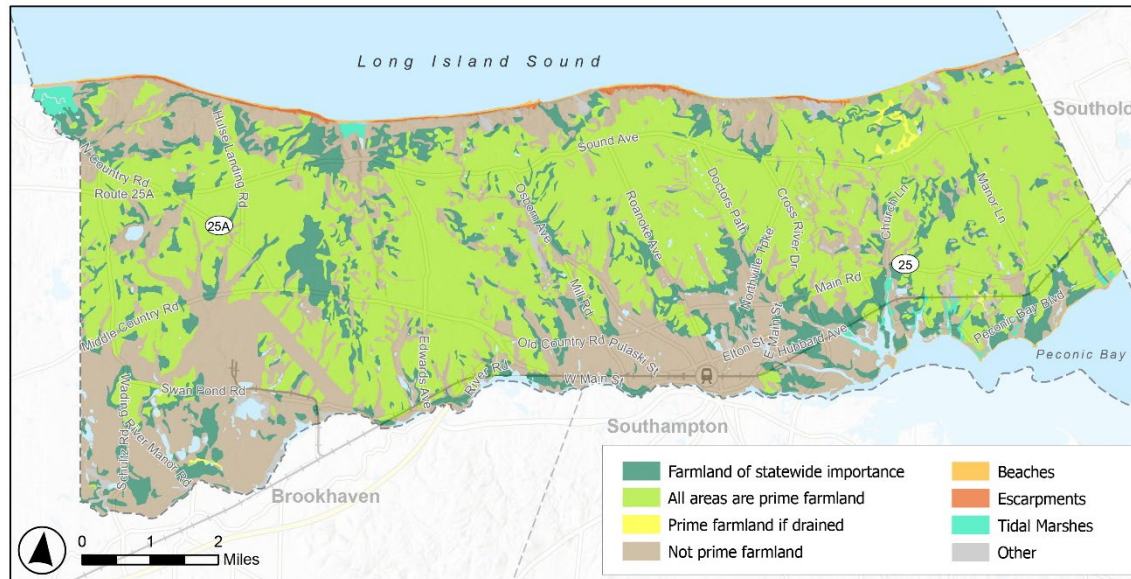
Riverhead's elevation ranges from 230 feet above sea level to sea level. A rolling landscape, flat lands, and coastal bluffs characterize the Town's topography. The advance and retreat of glaciers formed these natural features thousands of years ago; the weathering action of rain that erodes the landscape over time; the movement of soil particles through the landscape by rivers and streams; and the shifting of landforms created by the movement of large water bodies, particularly those with tides.

Riverhead's north shore has a hilly ridge known as the Harbor Hill moraine, which runs along the northern edge of the Long Island Sound. Along the southern edge of the Town, just south of the Peconic River, is a second ridge known as the Ronkonkoma moraine. Between these two ridges is a broad, flat outwash plain that characterizes most of Riverhead's land and provides prime agricultural soils in the Town's core.

## Soils

Figure 5 shows a pattern of prime agricultural soils and soils that are not suitable for farming in Riverhead based on the USDA Soil Survey Geographic Database (SSURGO).<sup>6</sup> Categories used to describe the farmland suitability of different soil types and descriptions of soil types in this section are adapted from Soil Survey of Suffolk County, New York, and the USDA-NRCS Official Soil Series Descriptions.<sup>7</sup>

Figure 5. Soils by Suitability for Agriculture



Sources: NYS GIS, Suffolk County, Town of Riverhead, USGS, USDA, SSURGO, BFJ Planning

### Prime farmland

Prime farmland areas comprise approximately 29% of Riverhead's total land area. These areas are 84% Riverhead sandy loam soils with 0 to 8% slopes, 12% Haven Loam soils, and thick surface layer soils with 0% to 6% slopes. Various other soil types that appear in smaller quantities include Montauk silt and sandy loam, Sudbury sandy loam, and Scio silt loam, with slopes ranging from 0% to 8%. Soils in the Riverhead and Haven Series are characterized by deep, well-drained, moderately coarse-textured soils with moderate to high available moisture capacity. These features make them well-suited for agriculture. In addition, their ease of excavation makes them viable for housing and

<sup>6</sup> United States Natural Resource Conservation Service, U.S. Department of Agriculture, Soil Survey Geographic Database (SSURGO), <https://www.nrcs.usda.gov/resources/data-and-reports/soil-survey-geographic-database-ssurgo>

<sup>7</sup> United States Conservation Service, U.S. Government Printing Office, 1975. Available on Google Books. <https://play.google.com/store/books/details?id=Qd9JAAAYAAJ&rdid=book-Qd9JAAAYAAJ&rdot=1&pli=1>

United States Natural Resource Conservation Service, U.S. Department of Agriculture, Official Soil Series Descriptions (OSD), <https://www.nrcs.usda.gov/resources/data-and-reports/official-soil-series-descriptions-osd>

other development. In Riverhead, prime farmland soils are found in the outwash plain between the two moraines corresponding to Riverhead's existing agricultural regions.

### **Farmland of statewide importance**

Farmlands of statewide importance comprise 15% of Riverhead's total land area. 80% of these soils are Plymouth Series soils, including loamy sand and silty substratum, with 0% to 8% slopes. Ten percent of these soils are Riverhead sandy loam with 8% to 15% slopes, 5% are Deerfield sand, and the remaining soils are Montauk silt loam and loamy sand with 8 to 15% slopes, Wareham loamy sand, Haven loam with 6% to 12% slopes, and Walpole sandy loam. Plymouth Series consists of deep, excessively drained, coarse-textured soils with low available moisture capacity. Farmland of statewide importance is often found on the outwash plain and steeper sloping areas along the moraines.

### **Prime farmland if drained**

The only area in this category found in Riverhead is mainly within the boundary of the North Fork Preserve (between Sound Avenue and the Long Island Sound, north of Church Lane Street), a conservation area owned by the County. In Riverhead, this category is entirely comprised of Raynham loam soils, which are poorly drained and occur in low-lying areas beside marshes and creeks. These soils are only well suited to crops if they are artificially drained and are better conserved as woodland areas.

### **Not prime farmland**

About a third of Riverhead's land area is not prime farmland. 53% of soils in this category are Carver and Plymouth sands with 0 – 35% slopes. 18% are Plymouth loamy sands with 8% - 15% slopes and eroded Plymouth gravely loamy sands with 3% to 15% slopes. 16% are cut and fill lands. The remainder includes Berryland mucky sand, tidal marsh, Atsion sand, escarpments, urban land, fill, dredged material, gravel pits, graded Riverhead and Haven soils, and recharge basins. Two general areas of this category run east-west along the moraines to the north and south of the prime agricultural regions.

The area of Riverhead on the north shore, along the Harbor Hill moraine, is comprised of excessively well-drained coarse-textured soils. Steep slopes and the sandy texture of the soil make it unsuitable for farming, prone to erosion, and limits development. Grading, logging, or clearing of woodlands can exacerbate erosion.

This rolling, hilly area in the south of Riverhead, bordering the Peconic River and Flanders Bay, has coarse-textured soil that drains rapidly, making it unsuitable for agriculture. In addition, steep slopes and high-water tables in areas also limit development. The rapid permeability of the soils can contribute to groundwater contamination.

Three incredibly fragile soil types are found in small quantities in pockets or along the coast.

1. Beaches: Riverhead's beaches on the North Shore are gravelly and cobbly, while beaches on the bays are sandier. Measures should be taken to keep the beach wide enough to protect nearby dunes and uplands.
2. Escarpments: Escarpment soils include bluffs with slopes greater than 35% that occur along



the north shore of Riverhead. With such steep slopes, they are highly subject to erosion. Riverhead's escarpments generally lack vegetation and have large boulders embedded in them. Escarpments are habitats for some species of songbirds.

3. Tidal Marsh: Tidal marshes are shoreline areas not inundated by daily tide flow but subject to flooding during abnormally high moon or storm tides. Tidal marshes have layers of organic mat and pale gray or white sand. Tidal marshes are best suited to wildlife habitat.

## **Town Regulations and Programs**

---

### **Conservation Advisory Council (CAC)**

The Conservation Advisory Council (CAC) reviews applications for development activities within 150 feet of the Town of Riverhead Freshwater Wetlands and 300 feet of the New York State Department of Environmental Conservation Tidal Wetlands, as called out in Riverhead Town Code Sections 293 and 295.

While most of the applications relate to single-family residential development and the construction of related structures, there have been several significant applications that the CAC has reviewed that have a broader Town impact. For example, applications for development on the Peconic Bay require 10-foot buffers along bulkheads to prevent the introduction of nitrogen-based fertilizers into the Peconic estuary.

### **Environmental Advisory Committee (EAC)**

By Resolution No. 2018-818, dated November 7, 2018,, the Town Board established the Environmental Advisory Committee (EAC) to advise the Town on the preservation, development, and use of natural and man-made features with consideration for beauty, quality, biological integrity, and other environmental factors. Notably, the EAC recognizes threats posed to environmental quality and works to ensure long-term sustainability. The mission of the EAC is to serve as a resource for facilitating conservation and environmental stewardship by the Town and its residents through education, government policies, and incentives. The EAC provides informative and educational bulletins, issue briefs, and position statements and makes recommendations to the Town Board, Planning Board, Planning Department, and all other interested boards, staff, and committees of the Town as necessary. The EAC has been instrumental in leading the Town's New York State (NYS) Department of Environmental Conservation's (DEC) Climate Smart Communities (CSC) program, discussed further in the Sustainability and Resilience chapter.

### **Community Preservation Fund**

As discussed in the Agriculture chapter, The Peconic Bay Region Community Preservation Fund (CPF) is a public program managed by each of the five East End Towns to protect farmland, open space, and community character.

## **Regional Partners and Programs**

---

The Town regularly collaborates with many regional partners to assist with environmental stewardship and sustainable resource management, including the following, but not limited to:

### Peconic Land Trust

Since its founding in 1983, the trust has been dedicated to conserving and protecting the scenic beauty, farmlands, and natural resources of the Peconic Bay region. Through strategic land acquisitions, conservation easements, and community engagement initiatives, the Peconic Land Trust actively works to sustain the delicate balance between development and preservation.

### The Nature Conservancy

The Nature Conservancy's work combats climate change, protects the oceans, land, and freshwater, and provides for food and water sustainability through research, partnerships, and actions. The Nature Conservancy has worked with Riverhead to acquire lands for protection and stewardship, including the Central Pine Barrens Preserve, Calverton Ponds Preserve, and Wading River Marsh Preserve.

### Cornell Cooperative Extension

Cornell Cooperative Extension is a collaboration between Cornell University's College of Agriculture and Life Sciences and the College of Human Ecology and local communities. The Suffolk County chapter is in Riverhead. Researchers, Educators, and volunteers are dedicated to preserving the heritage, protecting the ecosystems, and supporting the economy through research, training, and educational initiatives.

### New York Sea Grant

Sea Grant is a program of the National Oceanic and Atmospheric Administration (NOAA). New York's Sea Grant partners with Stony Brook University on Long Island to advance research in a variety of marine, aquatic and coastal topics. With experts in oceanography, aquatic toxicologists, geochemists and more, Sea Grant leads the scientific community and disseminates research through workshops, journal articles, and more. Sea Grant has been instrumental in examining the health of the Long Island Sound and Peconic Estuary, leading projects on fisheries and aquaculture, coastal ecosystems, coastal resiliency, and environmental justice.

## Goals and Recommendations

---

### ***Goal 1. Protect and preserve the ecological integrity of Riverhead's Central Pine Barrens area and the water quality of Long Island's sole source aquifer.***

---

The Central Pine Barrens area and the aquifer beneath are among the most critical natural resource areas in the Town from both a natural resource and public health point of view. The aquifer is part of a more extensive system providing millions of people drinking water. The State, County, Town, the Nature Conservancy, and others have acquired lands in the Pine Barrens Core Preservation Area for permanent preservation. Additionally, private property owners in these areas have transferred development rights through the Pine Barrens Credit (PBC) Program.

**1.1. Continue to implement the Central Pine Barrens Comprehensive Land Use Plan and meet its development standards and guidelines.**

Following the Plan's directives is essential to help protect natural resources critical to Riverhead and the region for the long term. This Plan is anticipated to be amended in 2024. The EAC should review the updated Plan to determine whether to recommend revisions to Riverhead's Community Preservation Project Plan and Town Code. As noted in the existing conditions section of this chapter, section 9.2 of the CLUP allows economic development in EPCAL without the development restrictions that are imposed elsewhere in the core preservation area by the Pine Barrens Protection Act.

**1.2. Cooperate with local non-profit organizations, the County, and the State working to acquire and protect lands in the Central Pine Barrens area.**

Encourage private property owners within the Core Preservation Area to use the Pine Barren's TDR program. Through a coordinated effort, the State, County, Town, or nonprofits should acquire any lands that become vacant or available for sale.

**Goal 2. Protect the quality of ground water and surface waters throughout the Town.**

---

Watershed management is essential for protecting and preserving the Town's water resources, including groundwater and surface water. Stormwater runoff, fertilizer and pesticide usage, improper disposal of hazardous waste, household chemicals, and pharmaceuticals, and sanitary systems contribute to water quality issues. Nitrogen pollution is one of the most significant concerns for Riverhead and the Long Island region. Poor surface water quality leads to the loss of habitats for plant and animal species and the closure of waters for swimming or shell-fishing due to biotoxins.

Groundwater quality and quantity are essential for safe and sustainable access to drinking water. Groundwater pollution, saltwater intrusion, rising sea levels, and future water supply demands all impact the aquifer's ability to provide drinking water.

**2.1. Consider the creation of a Comprehensive Water Management Plan With identified targets**

The Plan should establish targets to address issues raised in the Suffolk County Subwatersheds Wastewater Plan and identify specific water quality improvement and nitrogen (or other contaminant) load reduction targets that will allow the Town to access funding better.

**2.2. Encourage the use of I/A Systems and work to limit inputs of nitrogen, other nutrients, and toxic materials from sewage treatment plants.**

Suffolk County's Septic Improvement Program and New York State Septic System Replacement Programs award homeowners grants and low-interest financing options to transition to Innovative and Alternative Onsite Wastewater Treatment Systems (I/A OWTS or I/A). The Town should inform property owners about these grants and waive or reduce permit fees for installing I/A systems to incentivize their use.

The Town should ensure that in all areas where wastewater is discharged to the ground (i.e., septic systems, constructed wetlands, and package treatments plants) are built with the appropriate

densities and are designed to prevent nitrogen contamination of groundwater or surface water. Wastewater treatment is discussed further in Chapter 8: Infrastructure and Utilities.

**2.3. Encourage the use of Permeable Reactive Barriers and other means of cleaning contaminated ground water.**

Permeable reactive barriers are an inexpensive method to trap a range of contaminants. They can be used on brownfield sites, properties near the Central Pine Barrens Special Groundwater Protection Area, shoreline properties, and other locations where groundwater contamination is present.

**2.4. Improve enforcement of requirements for proper waste discharge from boats and houseboats and evaluate the need for additional pump-out facilities or vessels.**

Boating is a popular recreational attraction in Riverhead. Boats are required to discharge wastewater into the sewer connections available at Town docks. Municipal pump out stations are located at the East Creek marina and at the downtown municipal dock. To minimize the potential for boats improperly discharging their wastewater directly into the Sound and Peconic Estuary, the Town has acquired multiple marine pump-out vessels.

The Town should evaluate whether pump-out vessels and stations are adequate and if more facilities are needed. The Town should also notify houseboat owners about requirements for wastewater holding and disposal systems.

**2.5. Develop a best practice manual that instructing owners and operators about proper vessel discharge practices.**

Through a partnership with Sea Grant, the Bay Constable, and the Parks and Recreation Department, the Town should develop a manual outlining appropriate vessel discharge with resources for more information.

**2.6. Carry out dredging projects where needed.**

Determine whether flushing, dredging, and other improvements can improve small water bodies adjacent to the Sound and Peconic Bay, including but not limited to Baiting Hollow, Iron Pier, Wading River, and East Creek Marina or other docking facilities in Riverhead.

**Goal 3. Limit future increases in impervious surfaces and stormwater runoff to help reduce flood impacts and surface water pollution.**

---

Climate change is anticipated to bring increased an increased frequency and intensity of storms. Existing stormwater infrastructure needs to be improved to address these risks. Reducing the coverage of impervious surfaces will also enable the ground to absorb rainwater. Constant vigilance is required by the Town's Engineering Department and Highway Department to keep infrastructure in working order and to proactively maintain and enhance the system when needed.

**3.1. Continue to update regulations, ensuring they incorporate the latest stormwater best management practices (BMPs).**

Chapter 275 of Riverhead’s Town Code contains regulations for stormwater management that aim to mitigate the flow of non-point stormwater runoff into the Peconic River, Peconic Estuary, and other environmentally sensitive surface waters. Land development and redevelopment activities are subject to standards established by the New York State’s Stormwater Design Manual. Chapter 11 Infrastructure discusses BMPs in more detail.

The Town should revise §301-231 J the Town Code to increase stormwater storage capacities in parking areas to mitigate overflow and flooding. For projects that do not need a SWP, increasing the required storage capacity for self-contained stormwater management is recommended to be consistent with the International Building Code.

**3.2. Reevaluate Impervious coverage limits in commercial zones.**

Since the 2003 Comprehensive Plan, the Town Zoning Code has been revised to include impervious surface coverage limits. The Town should reduce coverage limits in commercial zones and encourage pervious surfaces and stormwater runoff improvements. On Route 58, the Town should consider reducing parking requirements (to meet current standards), and developing design guidelines to require landscaped islands and other green areas. Recommendations for design guidelines and landscaping on Route 58 are also discussed in the Economic Development chapter.

**3.3. Continue maintenance of Town-owned drainage systems.**

The Engineering Department and Highway Department are always working to improve the performance of the Town-owned stormwater management system. The Town files an annual Stormwater Management Plan with the NYSDEC that outlines priorities for the coming year. The condition of 52 outfalls is periodically checked and controlled to prevent pollution of Flanders Bay, Peconic Bay and River, Meeting House Creek, and Terry’s Creek. Property owners are required to control the discharge of stormwater to the street. ~~Annually~~, the Town of Riverhead has approximately 2,300 catch basins and the Highway Department cleans about 200 of them per year. The Highway Department also repairs catch basins and manholes on an as-needed basis.

The Engineering Department and Highway Department should continue to carry out their duties to ensure the proper functioning of the stormwater system.

**Goal 4. Conserve the coastal features of the Long Island Sound including bluffs, shoreline, and dunes.**

---

Riverhead has seen its coastline recede year after year. Changing sea levels, increasing storm frequency and surges, clearing of trees, and development near the Long Island Sound have all contributed to the erosion of bluffs and the coastline.

**4.1. Clarify and Strengthen the Coastal Erosion Hazard Code regulations.**

Additional guidance could be added to the code for the Zoning Board of Appeals to reference when reviewing applications in coastal erosion hazard areas. The Town should clarify the definitions within Chapter 219 and define when applications for development would require relief from the Zoning

Board of Appeals, which is the Coastal Erosion Hazard Board of Review. For example, the CEHA line and top of bluff/point of inflection are not always the same. The Town needs to have a more definitive way of determining if development is permitted or not under 219-14 B (Bluff Area Restrictions), which specifically lists development permitted under 219. Any development not listed in that section, even if it's moving a structure further away from the top of the bluff/CEHA line, requires relief from the ZBA.

#### **4.2. Track receding bluffs and shoreline.**

Lidar data could be used to map and track where the land is receding along the coastline and bluffs. This information would be useful for the public, planning board, and zoning board of appeals when making decisions about development on coastal properties.

### **Goal 5. Protect and restore environmentally sensitive lands, wetlands, and marine habitats.**

---

Animal and plant communities, wetlands, and marine habitats are critical to Riverhead and the region's ecosystems. For example, trees provide a range of benefits, including improving air quality, reducing stormwater runoff, providing habitat for wildlife, and enhancing property values. Significant threats to Riverhead's environment include the loss of trees, displacement of species caused by development, disconnected wildlife habitat areas, spread of invasive species, coastal erosion, alterations in hydrology, and climate change.

There is a need for more local knowledge and resources to address on-the-ground conditions in Riverhead. Fortunately, several regional institutions and conservation organizations are studying wetlands, marine, and other habitats and implementing restorative measures. These include the Nature Conservancy, Peconic Estuary Partnership, Long Island Sound Study, Save the Sound, Cornell Cooperative Extension Marine Program, and Stoney Brook Sea Grant.

#### **5.1. Strengthen enforcement of tree clearing.**

The Town has guidelines for permissible tree clearing, however, the regulations are sometimes ignored when properties are redeveloped. Improved monitoring and enforcement is needed to ensure compliance, promote sustainable development practices, and to maintain Riverhead's urban forest.

#### **5.2. Conduct a tree inventory to assess the health and condition of the Town's urban forest.**

This inventory would provide information on the types and locations of trees throughout the community and help the Town make informed decisions about tree management and preservation. The inventory would focus on trees along roadways as well as in town-owned open spaces. The tree survey would also help with policy and fund valuations for tree replacement and replenishment in connection with land development projects and property transfers. The Open Space Committee could assist the town with the tree inventory. Open space sites throughout the town, including state and county parklands, should be identified, and assessed for tree replanting or planting.

**5.3. Document and protect wildlife corridors.**

This study would help to document scattered wildlife areas area corridors and determine how to connect and preserve them. The study could identify preservation mechanisms, such as easements or purchase of development rights, and make the planning board aware of them when reviewing site plans.

**5.4. Establish formal standards around water bodies and wetlands.**

Guidelines for permitted development in regulated areas should be clarified in the Town code to help property owners and the Conservation Advisory Council with review of proposals. For example, guidelines could establish different standards for the distance from wetlands for lawn areas, structures, and sanitary systems.

**5.5. Comprehensively inventory and map wetlands.**

To supplement the County and State wetlands maps that rely on satellite or aerial data sources, Riverhead should incorporate on-the-ground field surveys, vegetation and soil sampling, and hydrology assessments to provide updated information to inform wetland protection and restoration decisions. Riverhead’s Freshwater Wetlands Inventory was last updated in 1979. Wetlands boundaries have likely shifted since that time and mapping and documentary technologies have improved substantially.

**5.6. Partner with environmental conservation groups and experts on a wetlands restoration initiative.**

The comprehensive wetland inventory and mapping process could be part of a wetlands restoration plan that the Town could develop with experts at conservation organizations and educational institutions.

**5.7. Encourage sustainable fishing and shell fishing practices.**

The Town could work with the Conservation Advisory Committee and Sea Grant to develop educational materials that inform anglers about sustainable practices, such as use of bycatch reducing gear and bird friendly fishing lines, and shell recycling.

**5.8. Continue to support and collaborate with the State, County, and institutions to protect significant coastal habitats and critical environmental areas.**

There are nine NYDOS-designated significant coastal habitats and several NYDEC-designated critical environmental areas in Riverhead. The Town should continue to follow the State’s recommendations and support efforts of partner institutions, such as the Nature Conservancy, Peconic Estuary Partnership, Save the Sound, Cornell Cooperative Extension Marine Program, and Sea Grant that are working towards this goal.

**Goal 6. Encourage ecofriendly landscaping and maintenance techniques.**

---

Ecofriendly landscaping projects include planting native plant species, removing invasive species, creating pollinator gardens, rain gardens, bioswales, and more. Native species work together to

enhance the local ecosystem, provide food sources to native animals and microorganisms, require less irrigation, and are easier to grow. Nature-based stormwater management techniques, such as rain gardens, are an attractive solution that private property owners can easily implement and help reduce flooding, filter pollutants, and recharge groundwater.

**6.1. Establish and showcase best practices for eco-friendly landscaping and stormwater management on public property.**

The Town, Highway Department, and relevant committees should identify appropriate locations to implement ecofriendly landscaping projects, train town landscaping staff to maintain them, and recruit volunteers to help. Landscaping materials and plants should be sourced from local nurseries and farms. The Town should also continue to encourage Suffolk County and State agencies to plant native species alongside roadways or in roadway medians where they have jurisdiction. There are also grant opportunities to fund the landscaping of Town-owned properties.

**6.2. Inform private property owners about available grants and programs to implement their own eco-friendly gardens and green infrastructure.**

Grants and programs through Suffolk County, Long Island Regional Planning Council, Long Island Sound Study, and Peconic Estuary Partnership are available for interventions such as rain barrels and gardens. The Town could also provide incentives to encourage homeowner participation.

**6.3. Work with non-profit and academic research institutions to develop an educational campaign promoting best practices for natural resource conservation.**

An educational campaign could include a manual, website, and programming targeted at residents, property owners, businesses, and developers. It should address stormwater management, encourage the use of native species, discourage the use of invasive plants, discuss laws regarding environmental protection (e.g., wetland and hazardous waste disposal regulations), encourage sustainable practices such as water and energy conservation, waste reduction, on-site nitrogen reduction systems, and provide information on government grants and other incentives.

The Town could work with the Cornell Cooperative Extension and other organizations, such as The Nature Conservancy and the Long Island chapter of the Wild Ones<sup>8</sup>, on this initiative. Information should be posted on the Town's website.

**Goal 7. Increase the Town's administrative capacity for working on natural resource conservation efforts.**

---

The Town needs more staff with specialized knowledge and skills in environmental and natural resource conservation and the ability to coordinate and enforce environmental policies. Monitoring of open space areas is required to ensure that wetland and water buffer areas, coastal erosion hazard areas, and open space set-asides in cluster subdivisions are not being cleared, developed, or otherwise inappropriately used. The State also requires the Town's help to enforce the provisions of

---

<sup>8</sup> Wild Ones is a national non-profit organization with local chapters that promote the many benefits of landscaping using native plants such as wildflowers, shrubs, trees, and grasses.



the Wild and Scenic Rivers Act. Regional projects related to natural resource conservation efforts must be coordinated between government agencies, research institutions, conservation organizations, and Town committees.

**7.1. Provide the human resources necessary to help implement the goals and recommendations of this chapter.**

An Environmental Planner or similar position within the Planning Department would help the Town coordinate environmental and natural resource conservation efforts with other entities.

**7.2. Improve enforcement of environmental regulations in Riverhead.**

Improved enforcement capabilities are needed for all environmental regulations contained in the Town Code. The Town is also expected to help enforce the provisions of the Wild and Scenic Rivers Act. A great deal of open space monitoring is required to ensure that wetland and water buffer areas, coastal erosion hazard areas, and open space set asides in cluster subdivisions are not being cleared, developed, or otherwise inappropriately used.

The Town may consider employing an additional Code Enforcement Officer to work exclusively on the environmental regulations and private covenant restrictions. The Town should review penalties for violations and application fees to ensure that they are effective and can offset enforcement costs.