

Natural Resources

Overview

Brunswick's diversity of natural resources is a result of its varied topography and geologic history. **With elevations ranging from over 350 feet above sea level to** extensive tidal marshes and mudflats, Brunswick hosts a unique mix of species and habitat types relative to the rest of the Casco Bay region. Large blocks of northern hardwood forest remain in western Brunswick and these give way to lower elevation **white pine red oak forests to the east and south. Multiple rare natural community types** are driven by Brunswick's extensive glacial outwash sand deposits and tidal variations along more than 80 miles of coastline and riverfront. As a result of this diversity, significant portions of Brunswick fall within two of the State's 140 designated Focus Areas of Statewide Ecological Significance: the Kennebec Estuary Focus Area, and the Maquoit and Middle Bay Focus Area.¹ These focus areas have been collaboratively identified by biologists from the Maine Natural Areas Program (MNAP), Maine Department of Inland Fisheries and Wildlife (IF&W), Maine Department of Marine Resources (DMR), The Nature Conservancy, Maine Audubon, and Maine Coast Heritage Trust (MCHT) based on their exceptionally rich concentrations of at-risk species and natural communities and high quality common natural communities, significant wildlife habitats, and their intersection with large blocks of undeveloped habitat. The reason that resource agencies and conservation organizations have designated focus areas, is to highlight opportunities for strategic conservation and **proactive zoning measures at the local level. Several conservation funding programs prioritize land protection efforts located within designated focus areas. The town of Brunswick and Brunswick-Topsham Land Trust have been successful in leveraging significant funding to match local contributions as a result of local focus area designations.**

Kennebec Estuary Focus Area

As its name implies, the Kennebec Estuary Focus Area extends down the Kennebec River from the Town of Gardiner to its confluence with the Androscoggin River in Brunswick and out to the Atlantic Ocean. At the heart of the Focus Area is Merrymeeting Bay, one of the most important waterfowl areas in New England. ²Brunswick's portion of this focus area includes tidal portions of the Androscoggin River eastward to the municipal boundary in Merrymeeting Bay. Upland areas north of the Androscoggin River bike path and north of Old Bath Road excluding Bay Bridge mobile home park are **included in this focus area. Key natural features in Brunswick that contribute to the** focus area's values include each of the riverine islands, recently acquired Merrymeeting Park, the outlet stream of the recently acquired Maine Gravel Service property which supports a diadromous fish run, and the freshwater intertidal mudflats along the river

shore that support many rare (some globally rare) but easily overlooked small plants uniquely adapted to life between the tides. Additionally, Brunswick's Androscoggin supports a rare freshwater mussel species, the tidewater mucket, as well Atlantic salmon, Atlantic sturgeon, and short-nosed sturgeon all of which are listed by state and federal resource agencies.



Photo c/o Maine Department of Inland Fisheries & Wildlife

Maquoit and Middle Bay Focus Area

The Maquoit and Middle Bay Focus Area has been designated in large part due to the regional importance of Brunswick's intertidal salt marsh, eel grass beds and mudflat communities for migratory waterfowl, shorebirds and passerine species including the endangered saltmarsh sparrow, **Critical** freshwater streams and upland forests that contribute to the health of these intertidal areas have also been included as key **components of the focus area**. Brunswick's portion of this focus area includes areas seaward of Bunganuc Road, Great Gully Stream to Brunswick High School, the entirety of Maquoit Woods, the Pennellville area, and portions of Kate Furbish Preserve southward to the Harpswell townline. Key features in Brunswick include the western shoreline of Maquoit Bay which has largely been conserved through joint efforts of the State, US Fish and Wildlife Service, Brunswick-Topsham Land Trust, and the town; Gamble Marsh and the Middle Bay salt marsh both of which are priority saltmarsh sparrow restoration sites designated by the USFWS Atlantic Coast Joint Venture; and

Maquoit Woods which represents the last and largest unprotected forest block within the focus area. Aside the inherent value of these areas for water quality protection and habitat functioning, protection of the Maquoit and Middle Bay Focus Area has significant local economic values associated with the quohog and soft-shell clam industries, growing aquaculture sector, and multiple recreational values.³

Important Bird Area

Maine's Important Bird Area (IBA) program is part of a global effort to identify areas that are most critical for long-term bird conservation. IBAs must meet a set of criteria developed by a technical committee of ornithologists from resources agencies and non-governmental partners. The criteria are focused primarily on large seasonal concentrations of birds, occurrences of species of conservation concern, and overall species diversity. To date, only 22 IBAs have been designated in Maine. In Brunswick, the sandplain grasslands and open fields of Brunswick Landing; riparian areas forests, and saltmarshes associated with Mere Brook; and the tidal flats and marshes of Maquoit Bay have each been designated as key elements of the Brunswick/Freeport Important Bird Area.

Significant Wildlife Habitats

Brunswick is home to six different Significant Wildlife Habitats as designated by the Maine Department of Inland Fisheries and Wildlife and regulated through the Maine Department of Environmental Protection's **Natural Resource Protection Act**. These habitats include:

Inland Wadingbird and Waterfowl Habitats are large freshwater wetland complexes typically including and mix of emergent vegetation and open water supporting a diversity of breeding and migratory bird species. Examples in Brunswick include the Simpson's Brook headwater wetlands east of Brackett Road and wetlands associated with the outlet stream from the Maine Gravel Services pond where it approaches Merrymeeting Bay.

Tidal Wadingbird and Waterfowl Habitats which include larger saltmarshes, mudflats, and eel grass meadows supporting important breeding season feeding areas, wintering **areas and migratory stopover sites for a variety duck, goose and heron species**.

Maquoit Bay, considered one of the most important wintering areas for migratory American black ducks in the State, is an example of Significant Tidal Wadingbird and Waterfowl Habitat as are the tidally influenced portions of the Androscoggin River.

Shorebird Feeding and Roosting Areas identified because they are critical for the support of a diversity of migratory sandpipers, plovers, etc. many of which are in steep decline throughout their range occur in both upper Maquoit **and Middle Bays** This

Significant Wildlife Habitat type includes both rich intertidal mudflats where shorebirds refuel on invertebrates during long distance migrations and protective resting sites (roosts) that the birds utilize when the tide is high (typically ledges and saltmarshes).

Significant Vernal Pools include the best and most productive vernal pools on the landscape. This designation is based on egg mass counts of indicator species and **requires field observations at the appropriate time of year. To date, not all vernal pools have been mapped in Brunswick and certainly not all Significant Vernal Pools have been verified locally. Given global declines in amphibian populations, all vernal pools, not just those that meet significance criteria, are worthy of local protections.**

Deer Wintering Areas, typically closed canopy softwood stands, are no longer considered biologically necessary in coastal Cumberland County due to changes in **typical winter conditions and excessive deer populations. While still important in northern and eastern Maine, deer wintering areas are no longer considered to be a significant habitat type in Brunswick.**

Endangered and Threatened Species Habitat for animals designated under the Maine Endangered Species Act will soon also be considered as a Significant Wildlife Habitat type following a recent law update passed in the 131st Legislature. **A list indicating which state-listed species occur in Brunswick is attached.**

Significant Fisheries Habitat

The Mill Stream headwaters located in western Brunswick flowing from Durham Road southwest to Old Portland Road and to the Freeport town line, and Mere Brook and its tributaries have both been designated as Wild Brook Trout Priority Areas by MDIFW. Diadromous fish habitats mapped by the Department of Marine Resources also fall under the definition of Significant Fisheries Habitat.

Endangered, Threatened, and Special Concern Plants and Animals

Please refer to table of known Rare, Threatened, and Endangered Species included at the end of this inventory.

Rare and Exemplary Natural Communities

Brunswick is home to a variety of critically imperiled, imperiled, or rare natural communities (as defined by the Maine Natural Areas Program). Natural communities are naturally occurring assemblages of plants and animals that occur on the landscape based on underlying geology, climate conditions and other factors. Rare and exemplary natural communities in Brunswick include the following:

- Birch-Oak Rocky Woodlands (rare) - located along steep slopes in the extreme northeast part of Brunswick overlooking the mouth of the Androscoggin River.

- Freshwater Tidal Marshes (imperiled)- occur along banks of the Androscoggin River **subject to tidal action.**
- Hemlock-Hardwood Pocket Swamp (imperiled)- BTLT held easement on **Highland Road and unprotected example on Lunt Road.**
- Pitch Pine Heath Barren (critically imperiled)- examples occur at Maquoit Woods, Town Commons, Capt Fitzgerald Preserve, and along the west side of Brunswick **Executive Airport.**
- Pitch Pine Bog (imperiled)- Town Commons
- Pitch Pine-Scrub Oak Barren (imperiled)- small patch remaining at the “saw-tooth” **grassland along western side of runway**
- Salt-hay Saltmarsh (rare)- heads of coastal bays and protected coves from Maquoit to **New Meadows. Largest patches include Gamble Marsh, head of Harpswell Cove, Adams Road, and what remains of the marsh at the north end of New Meadows “lake”.**
- Sandplain Grassland (critically imperiled)- examples include Brunswick High School and Crystal Spring Farm, Brunswick Landing, and Capt. Fitzgerald **Preserve.**
- Silver Maple Floodplain Forests (rare)- examples occur from the mouth of the Androscoggin west to BTLT’s **Coombs property.**

Each of these natural communities provides habitat for a wide variety of plant and animal species, including some identified threatened or endangered species.⁴

Other Important Wildlife Habitats

Finally, there are a variety of other areas of the community that serve as important **wildlife habitats. These include:**

- Wetlands which are defined based on hydrology, soil type and supported vegetation. Brunswick supports a wide variety of wetland types ranging from **tidal marshes to cedar swamps, wet meadows to gravel beaches. Wetlands are some** of the most important and vulnerable natural resources in the community as they provide a variety of benefits such as groundwater recharge, sediment retention, floodflow alteration, plant and animal habitat, finfish and shellfish habitat, and **educational/cultural benefits. The physical functions wetlands provide will** become increasingly important as Maine’s climate becomes warmer and wetter **and our built environment only increases in terms of impervious cover.**
- Unfragmented Habitat Blocks, large forested areas with little or no development impacts, are essential for maintaining a diverse wildlife population, protecting

water quality, sequestering carbon, and supporting traditional hunting and other forms of outdoor recreation and traditional natural resource based businesses including farming and forestry. The health and diversity of these blocks typically increases with the size and **age of the forest stand**. **Brunswick still has examples of late successional forests >90 years old**. These older stands should be especially prioritized for protection given their values for biodiversity and carbon sequestration. Development fragments forest blocks reducing their value and ecological functions. As a result of Brunswick's efforts to include forest blocks in an overlay zone, our town has maintained habitat types lost in most coastal Maine communities to the south. Wildlife Travel Corridors, which are essential to **connect blocks of unfragmented lands together**. Typically relatively narrow but naturally vegetated corridors leading from forest block to forest block aid in the health, diversity, and stability of the Town's wildlife resources and providing long-term viability for species as climate and inevitable development pressures **necessitate species being able to move across the landscape**.

- Riparian corridors, which include the naturally vegetated buffer zones that border streams that meander throughout the community, are important travel corridors for wildlife and are important terrestrial wildlife habitats and key contributors of **woody and organic debris to adjacent aquatic habitats**. Additionally, protection of these areas is critical for maintaining water quality and water temperature **necessary to support our local fisheries**.
- Threats to Critical Natural Resources
- The 2008 Comprehensive Plan identified the following as key threats to natural resources in the community:
 - Continuing growth in rural areas;
 - Land use activities such as draining, clearing and/or filling of wetlands;
 - Lack of understanding of the location and importance of vernal pools;
 - Scattered rural development fragmenting undeveloped forest blocks with **significant wildlife habitat value**.

In addition to these previously recognized threats, incremental loss of the town's important plant and animal habitats continue, riparian buffers along streams continue to be converted to lawns or neglected and used as debris dumps, and more and more shoreland development with associated piers and docks squeezes critical intertidal habitats already declining with sea level rise, and the cumulative effects of project by project wetland loss have further reduced the natural ability of our lands to **accommodate stormwater and protect surface waters from runoff**. On top of these

threats, additional climate change associated stressors have further underscored the need to increase protections for our local resources.

Since 2008 the town has protected several parcels within Focus Areas of Statewide Ecological Significance (most notably Maquoit Woods and Merrymeeting Park), portions of unfragmented forest blocks, and some that include rare natural **communities. Currently a little over 13% of Brunswick's land mass is in some form of permanent protection. The 2008 Plan called for the capitalization of a Land for Brunswick's Future bond which would provide local match to leverage state and federal land conservation funding. To date, no action has been taken by the town council.** Greater protection of Brunswick's natural resources is a 'no regrets' approach to conserving our green infrastructure and maintaining natural climate resiliency which once lost is very expensive to replace and restore. ⁵

Protective Measures

Since the adoption of the 2008 Comprehensive Plan, the Town has been working diligently to rectify the key threats identified. The Town has implemented a variety of changes to protect natural resource areas from continued growth, described further below.

Regulatory Protection

The Town went through a Zoning Ordinance rewrite and zoning map update project in 2017, which led to the following policies related to environmental issues being adopted:

- The Open Space Density Bonus in the Rural Area was increased from 15% to 25% (Section 4.2.5.E and Table 4.2.5.E), which provides additional incentive for developers who would not otherwise consider applying under this subdivision to **conserve open space within their proposed development.**
- An applicant proposing development in the Wildlife Protection Overlay District (previously the Rural Brunswick Smart Growth Overlay) is required to show the history of fragmentation before any disturbance is permitted in order to better **track prior development of the parcel (Table 2.3.5.E).**
- Stronger standards pertaining to pollution (Section 4.3.2), protection of natural vegetation (Section 4.3.3), protection of significant plant and animal habitat (Section 4.3.4), and protection of surface waters, wetlands, and marine resources **(Section 4.3.8) were established.**

- The protective standards contained in the Coastal Protection 1 (CP1) and Coastal Protection 2 (CP2) Zoning Districts (now Rural Protection 1 (RP1) and Rural Protection 2 (RP2)) were extended along the New Meadows River **shoreline.**
- Shoreland Protection Overlay (SPO) District (Section 2.3.3) standards were updated to comply with the most recent State language that allows for the **enforcement of resource protection requirements.**
- Significant vernal pool habitats are now excluded from the calculation of net site area for the purpose of determining density (Section 4.2.5.(7).c), reducing the **incentive to develop in these sensitive areas.**
- Similar language to the BNAS Reuse Master Plan's "Recreation and Open Space" and "Natural Area" land use districts was used in the creation of the Growth Natural Resources (GN), Growth Outdoor Recreation (GO), and Rural Natural Resources (RN) Zoning Districts (Sections 2.1.3.H and I, and Section 2.2.1) in order to clearly communicate that these areas are intended for the **protection of existing natural resources.**
- After completion of the 2017 rewrite project, two other amendments to the Zoning Ordinance were adopted to further protect lands with high resource value:
- August 2018: Upon recognizing errors in the Aquifer Protection Overlay (APO) (Section 2.3.2) and SPO (Section 2.3.3) standards that were not identified by MDEP, Town staff prepared an amendment to fix the following:
 - Errors regarding restricted activities in the APO2 District.
 - The effective date for non-conforming lot standards within the SPO.
 - Change non-conforming building expansions from percent volume increase to **percent building footprint increase.**
 - Limit non-vegetated lot surfaces within the SPO to 20%.
 - Adopt the State's definition of "tributary stream."
- October 2019: A new Rural Protection Stormwater Management Overlay (RPSMO) District was established to replace previous regulations prohibiting development within 75 feet of slopes exceeding 15%, which severely limited changes to properties in the RP1 and RP2 Zoning Districts (making approximately 48% of properties non-conforming). The new regulatory framework moved away from the previously required mandatory building setbacks from slopes greater than 15% to focus instead on proximity to coastal areas and inland streams that would allow for some level of soil disturbance and construction

activity, provided negative environmental impacts could be mitigated through **stormwater best management practices**.

The 2002 Parks, Recreation and Open Space Plan identified a variety of scenic areas across the community (detailed further on the following pages).⁶ The Town's Zoning Ordinance has been amended to protect scenic areas through the following measures:

- a. The Rural Farm and Forest (RF), Rural Residential (RR), and the Rural Protection 1 and 2 (RP1 and RP2) Zoning Districts all cite the protection of, "natural and scenic resources, including wetlands, unfragmented wildlife habitats, and scenic roads" as reasons for the regulations established in each district. Similarly, the Rural Mixed Use (RM) Districts established supplemental standards, "to protect the area's natural resources and scenic values, minimizing disturbance of existing features and vegetation during development."
- b. Scenic assets are one of the criteria that can be included within the protected **conservation lands required for approval of an Open Space Development**.
- c. Section 4.3.3.B.(1) states that developments within Scenic Areas identified within the 2002 Plan are required to: maintain an existing vegetated buffer of at least 25 feet along existing roads/rights-of-way except where doing so conflicts with the protection of other protected natural resources. The buffers may be broken only for driveways, streets, and stormwater infrastructure where it is impracticable to **locate them elsewhere**.

For over a decade, the **town has** implemented a Wildlife Protection Overlay (WPO) District outlined in the Zoning Ordinance, the purpose of which is to reduce the continuing loss or fragmentation of habitat for native species in rural zoning districts, while simultaneously accommodating development in these districts. The WPO District consists of the rural portions of large (greater than 150 acres) continuous blocks of naturally occurring stands dominated by woody vegetation (Wildlife Habitat Blocks), as well as wildlife corridors that consist of the overland connections between Wildlife Habitat Blocks that provide naturally vegetated linkages supporting daily and seasonal species movement between Wildlife Habitat Blocks. The intent of the requirements of the Overlay is to minimize the removal of woody vegetation that breaks large unfragmented forest blocks into smaller patches of forest and to minimize activities that block or limit species movement between unfragmented forest blocks. This is accomplished through mitigation requirements and incentives for not disturbing wildlife **corridors**. **The specific requirements of this overlay district have not been revisited since** its enactment and while the overlay has effectively slowed rural fragmentation, incremental clearing and development have resulted in notable shrinkage of unfragmented habitat blocks in both the northwestern and northeastern portions of **town**.

Other Mechanisms for the Protection of Natural Resources

In addition to the above regulatory mechanisms, the Town has also established a Recreation Facilities Impact Fee, where money is collected from developers (based on a population per dwelling unit built allocation) which can be used for the acquisition of high value open space or easements as well as environmental mitigation costs for properties **that would be accessible to the public for recreational purposes.**

The 2008 Plan called for changes to the zoning ordinance that would developers to **provide in-kind or fee-based mitigation for impacts to wetlands.** A draft of this ordinance was presented to the town council in the Spring of 2023 and voted unanimously to go to planning board review but has yet to be placed on an agenda.

Since the 2008 Comprehensive Plan noted a lack of understanding about the locations of vernal pools, the Town began working on a survey in an attempt to identify the Town's significant vernal pools. The State's Natural Resource Protection Act (NRPA) defines a "significant" vernal pool as one that contains specific threatened or endangered species or that contains high enough numbers of egg masses for specific amphibians. If a significant vernal pool is determined to exist on a property, the owner must obtain a permit from MDEP to disturb significant portions of the land within 250 feet of the pool's highwater mark. The Town identified additional significant vernal pools through the following projects:

- The Brunswick Conservation Commission's Town-Owned Open Space Inventory, **conducted between 2010 and 2014.**
- The Riparian Habitat Assessment Report, completed as part of the 2016 Mare Brook Watershed Assessment and Community Engagement Project, identified **seven significant vernal pools within the project survey area.**

Although the Town has a better understanding of vernal pools now than it did in 2008, it has not adopted ordinance provisions to protect vernal pools that are stricter than the State's current regulations. Potential provisions could include a more specific standard around mitigation measures (beyond that currently noted in Section 4.3.4.B) and/or increased buffer areas. Tracking studies of adult pool-breeding amphibians have shown that they can travel over a third-mile away from their breeding pool, and that the area within 750 feet of the pool is valuable for protecting viable amphibian populations.⁷

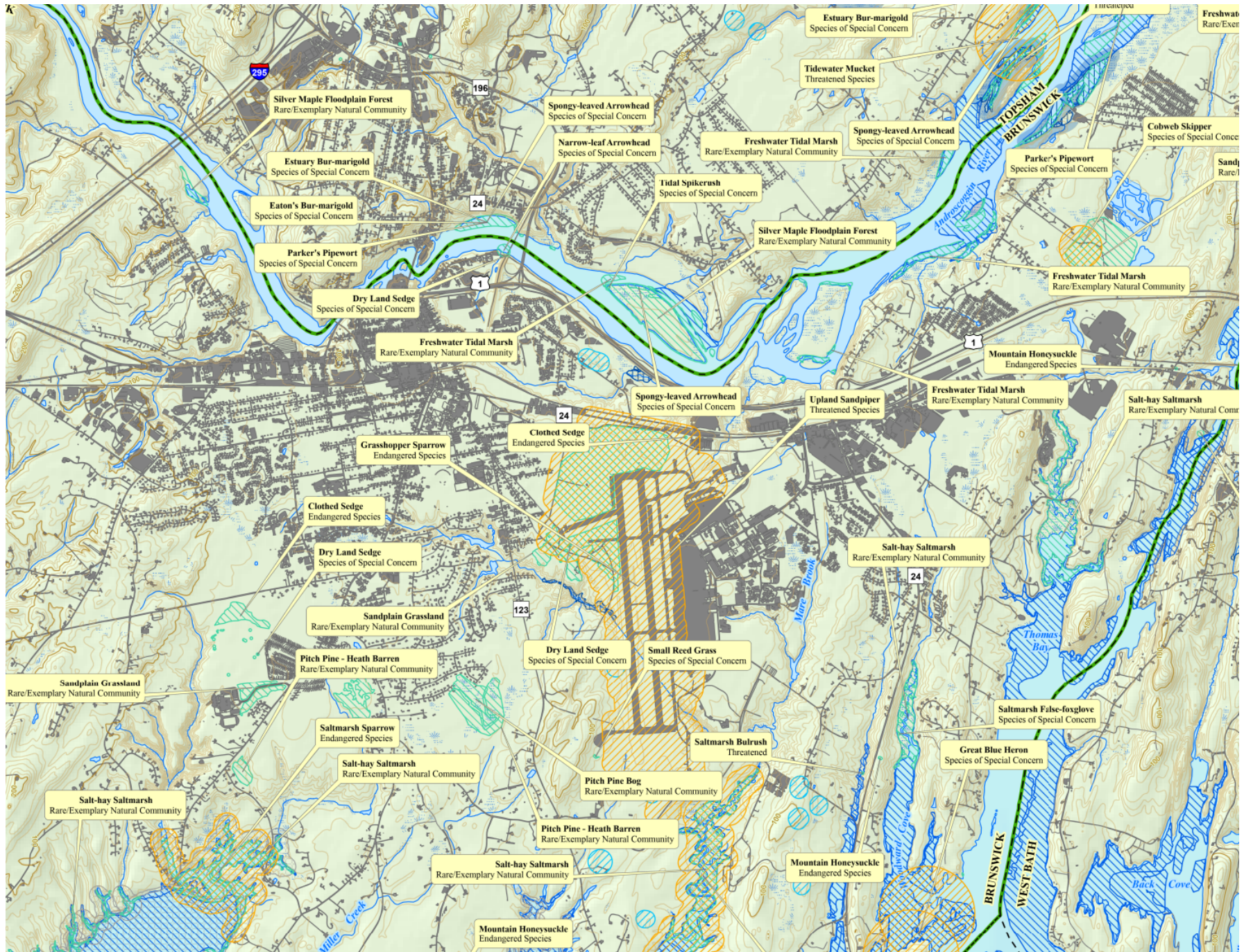
Similar to neighboring Topsham, the Town of Brunswick may voluntarily request delegated review authority from MDEP to participate in a Vernal Pool Special Area Management Plan (VP SAMP) that streamlines the NRPA permitting process for projects in the Growth Area that impact vernal pools. A VP SAMP requires the applicant to pay the Town a vernal pool impact fee which would then be transferred to a third-

party land conservation organization to conserve high quality vernal pools in rural areas identified in the Comprehensive Plan. Changes to the US Army Corps of Engineers (USACE) General Permit in October of 2020 streamlined federal permitting of Growth Area vernal pool impacts for municipalities with a VP SAMP.

Regional Coordination

Both Maine Coast Heritage Trust and the Brunswick-Topsham Land Trust are critical partners for local land conservation projects. Maine Coast Heritage Trust (MCHT) works to conserve coastal land and islands under a set of identified priorities (including scenic beauty, ecological value, recreational opportunities, and cultural heritage/community wellbeing). MCHT is the owner of Woodward Point Preserve, an 87.5-acre preserve which also features a water access point maintained by the Town. Brunswick-Topsham Land Trust (BTLT) manages more than 1900 acres of open space within Brunswick, providing space for trails and outdoor recreation as well as providing for the protection of critical natural areas.

Governmental entities including the Maine Department of Inland Fisheries and Wildlife (owner of Wharton Point, Gamble Marsh and the Mere Point Boat Launch) and the US Fish and Wildlife Service both provide significant resources for local land conservation projects. **The Casco Bay Estuary Partnership and Friends of Casco Bay play important roles in assisting with town water quality protection efforts, habitat restoration and public outreach.**



Borrowed from Beginning with Habitat, High Value Plant and Animal Habitats (Brunswick - Primary Map 2, partial)