



Natural Resources (including Water, Marine, Agricultural + Forest Resources) Subcommittee

Meeting Agenda

Friday, May 26, 2023 – 3:00PM

Location: Remote via Zoom (pursuant to the Committee's adopted [Remote Meeting Policy](#))

Join Zoom Meeting

<https://us05web.zoom.us/j/89729893063?pwd=TW5nT0t2TjhwOVo2ejc4ejAzcEpadz09>

Meeting ID: 897 2989 3063

Passcode: 04543

1. Call to Order
2. Review of Draft 1: Natural Resources Topic Area
3. Review of Draft 1: Water Resources Topic Area
4. Committee/Public Comment
5. Set next meeting date (to review Marine Resources and Agricultural + Forest Resources in detail)
6. Adjournment

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Natural Resources

Overview

Damariscotta's most significant natural resources are defined by its waterways and adjacent wetland ecosystems. Wetlands run along the shore of the Damariscotta River and Great Salt Bay, attracting shorebirds, migrating birds, fish, and harbor seals.¹ Further inland, the woodlands and watersheds of Damariscotta's ponds provide ample habitat for waterfowl and areas for deer migrating in the winter.

In addition to providing habitat for waterfowl, amphibians, and shellfish, the community's plethora of natural resources act as a natural barrier for nearby infrastructure. Healthy wetlands provide flood control during heavy precipitation periods by storing excess water, and the mudflats along the Damariscotta River and Great Salt Bay prevent shoreline erosion by holding soil in place. Shellfish and aquatic vegetation also filter sediments and other pollutants that would be carried into waterways from stormwater and snowmelt runoff.²

Development along watersheds and through wooded areas has fragmented habitats, and pollution from human activity has impaired the health of many ecosystems. For some migrating birds, even the presence of nearby human activity runs the risk of reducing the time available for shorebirds to eat and rest before continuing their migration.³ The Town has worked to prioritize ecosystem health through the adoption of ordinances meant to limit the pollution caused by development, described in further detail below. The Town also collaborates with the Coastal Rivers Conservation Trust to conserve land for passive recreation and on the restoration of ecosystems impacted by development.

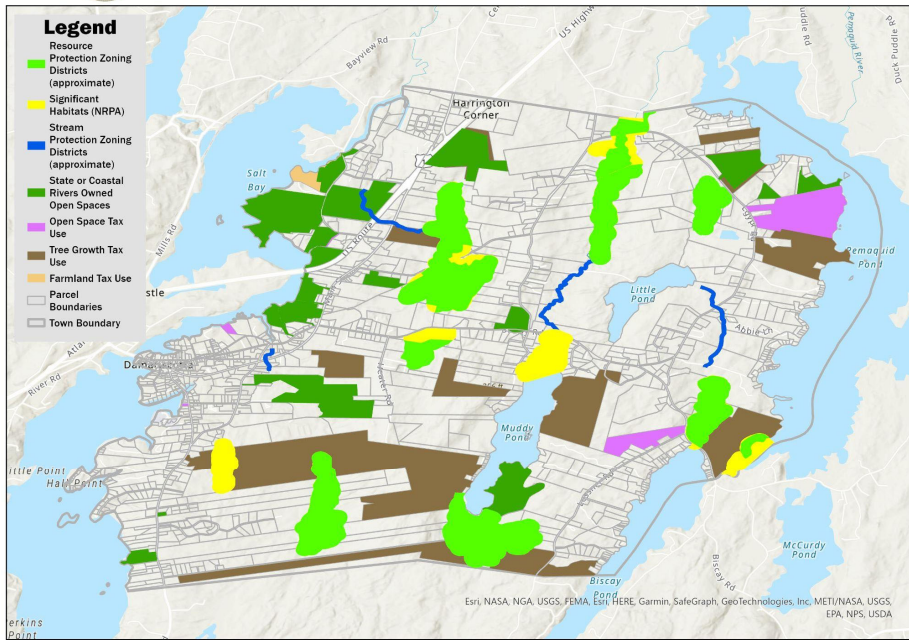
¹ "Wildlife of the Damariscotta," (Coastal Rivers Conservation Trust, 2023), <https://www.coastalrivers.org/about-us/river-facts/river-critters/>.

² "Conserving Maine's Significant Wildlife Habitat: Waterfowl & Wading Birds," (Maine Audubon, 2009).

³ "Conserving Maine's Significant Wildlife Habitat: Shorebirds," (Maine Audubon, 2009).



Natural Resource Areas



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Major Ecosystems

The most significant wetland areas within the community stretch along the shore of the Damariscotta River and Salt Bay, the banks of Back Meadow Brook, and the southern shore of Muddy (Paradise) Pond. Multiple oyster and clam species grow along the mud flats of the Damariscotta River, and Bald Eagles are active in two areas along the shoreline within Town boundaries; south of Hall Point and in wetlands west of Great Salt Bay Farm.⁴

The entirety of Great Salt Bay acts as habitat for a variety of species of waterfowl and tidal wading birds, providing breeding grounds and a resting spot during migratory flights. Within the region, the mud flats between Glidden Point and Damariscotta Mills sustain multiple species of shellfish, as well as shorebirds who eat their potential predators.⁵ Directly west of Salt Bay is the Damariscotta Mills fish ladder, which

⁴Beginning With Habitat, *High Value Plant and Animal Habitats* (Maine Department of Inland Fisheries and Wildlife, May 2018), <https://www.maine.gov/ifw/fish-wildlife/wildlife/beginning-with-habitat/maps/pdf/Damariscotta/Damariscotta%20Map%202.pdf>.

⁵ "Focus Areas of Statewide Ecological Significance: Salt Bay," (Beginning With Habitat).

leads to Damariscotta Lake. The fish ladder enables the annual migration of over a million alewives into the lake, through the Damariscotta River and Salt Bay.⁶

Additionally, the salt marshes around Oyster Creek are considered an exemplary natural ecosystem.⁷ While not endangered, the Maine Department of Environmental Protection (DEP) considers saltmarsh ecosystems a natural ecosystem of particular interest due to their rarity in the State of Maine.⁸ Currently, there is no recorded presence of rare species in the ecosystem, but saltmarshes do potentially provide habitats for rare plant species like Saltmarsh Sedge, or rare animals such as the Short-Eared Owl.⁹

The Little Pond watershed houses a population of Brook Trout maintained and consistently restocked by the Maine Department of Inland Fisheries and Wildlife (IF&W), and the woodland areas surrounding the pond act as winter shelter for deer. The largest deer wintering area is along the southern border of Town, among wetlands south of Castner Creek.

Conserved Lands and Scenic Views

Most conserved land in Damariscotta is managed by the Coastal Rivers Conservation Trust. Coastal Rivers oversees the health and public use of the Town’s most valuable natural resources. This includes the Castner Brook Community Forest, which protects over 85 acres of woodland west of Paradise Pond,¹⁰ and the Great Salt Bay Farm, which conserves 115 acres of former farmland that now provides educational and recreational activities to the community.¹¹

In 2019 and 2020, the Town’s Land Use Advisory Committee compiled a list of scenic views in the Town of Damariscotta, as well as the threats posed to them. The most common threats to scenic views come from development of residential or recreational areas and climate change.

Scenic View	Description of view	Nearest access point	Threats to scenic view
Days Cove	View to mud flats and river	Route 129 at Days Cove	None

⁶Annie Sherman, “The Centuries-Old Fish Ladder That Feeds Maine’s Lobster Industry,” (Atlas Obscura, April 26, 2022), <https://www.atlasobscura.com/articles/fish-ladder-maine-lobster-industry>.

⁷Amy Dowley, Beginning With Habitat, ed. Steve Walker, Beginning With Habitat (Maine Department of Inland Fisheries and Wildlife, 2023), <https://webapps2.cgis-solutions.com/beginningwithhabitat/mapviewer/>

⁸“Mixed Saltmarsh,” Maine Natural Areas Program (Maine Department of Agriculture and Forestry, 2021), <https://www.maine.gov/dacf/mnap/features/communities/mixedsaltmarsh.htm>.

⁹ Mixed Saltmarsh.pdf, natural resources folder

¹⁰Hannah McGhee, “Purchase of Castner Creek Community Forest Complete” (Coastal Rivers Conservation Trust, March 21, 2019), <https://www.coastalrivers.org/castner-creek-community-forest/>.

¹¹“Salt Bay Farm & Nature Center,” Coastal Rivers Conservation Trust, 2023, <https://www.coastalrivers.org/great-salt-bay-farm/>.

Salt Bay	View of fields and Great Salt Bay	Hard clam bed (Salt Bay)	Mid-and far-view building development
View along Belvedere Road 1,000 feet south of Branch Road	Undeveloped farmscape along rural road	Belvedere Road at Branch Road	Residences along road frontage
Biscay Pond	Morning mist on Biscay Pond from the road near the public beach	Biscay Road	Camp development
Paradise Pond	View across Paradise (Muddy) Pond	Shamrock Lane	Camp development
Misery Gulch	Looking across Misery Gulch to back of parking lot. The wreck of The Candage shows at low tide.	Schooner Landing parking lot	Climate change
Back view of Damariscotta	View of town from The River Tripper cruise	Damariscotta River	Climate change, development
DARA Pond	Looking across DARA Pond, a historic spot for ice skating	Church Street	Further development in the area
Damariscotta River	Tombolo landform, horseshoe crab spawning ground	Huston Landing Preserve	Climate change
Hilltop Cemetery	Historic Cemetery and trees	Hodgdon Street	None
River and Lewis Point	Looking up the river toward Lewis Point	Parking lot behind Damariscotta Pottery	Condo development

Mook Sea Farm	Oyster Farming on the River	Damariscotta River from River Tripper	Additional aquaculture, loss of habitat due to climate change
Whaleback Midden	Damariscotta River	Johnny Orr Rapids looking south	None
Cemetery and Old Oaks	Historic view of cemetery and old oak trees	Belvedere Road south of Branch Road	Development, farm buildings
Castner Creek	Castner Creek looking toward the Damariscotta River	Church Street	Development, storm surge, run-off
Castner Creek	Castner Creek looking toward upper Main Street	Church Street	Development, storm surge, run-off

Threats to Habitat and Ecosystem Health

Threats to Ecosystems

The watersheds around Muddy and Little Ponds, as well as Back Meadow Brook, are considered impaired due to development and pollution, meaning these ecosystems are vulnerable to degrading water quality. Development near a wetland can degrade wildlife habitat by increasing disturbances to birds or making habitats unsuitable for use due to stormwater runoff and sediment pollution. Physical structures, even docks and moorings, can block sunlight growth of wetland and saltmarsh vegetation. Human activity can disrupt the migratory patterns of multiple bird species, while stormwater runoff can contaminate wetland habitats with road salt, pesticides, and other toxic substances that make them unsuitable for certain species. Without direct action to minimize stormwater runoff sources, pollution is likely to become more common as climate change leads to increased annual precipitation rates.

As referenced in the Marine Resources section of this Plan, the wetlands and mud flats around downtown Damariscotta are vulnerable to runoff pollution and disruption from human activity. The discharge of treated wastewater from the municipal parking lot area has led to the presence of fecal coliform in the Damariscotta River.¹² Given the close proximity of Salt Bay to downtown Damariscotta, and the presence of an additional wastewater discharge site located next to the Damariscotta Mills fish

¹² Susanne K Meidel, "2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report Appendices https://www.maine.gov/dep/water/monitoring/305b/2022/25-May-2022_2018-22_ME_IntegratedRpt-LIST.pdf.

ladder in Nobleboro, the presence of human waste contamination is possible in Salt Bay, which would likely affect the health of fish migrating north to Damariscotta Lake and contaminate the exemplary saltmarsh ecosystems in Oyster Creek.

Threats to Species

There are no known critically endangered plant¹³ or animal¹⁴ species in Town, although as referenced above, Bald Eagles nest along the Damariscotta River. Bald Eagles were considered an endangered species in Maine until 2009, and are still a species of concern protected by the federal Bald Eagle-Golden Eagle Act of 1963.¹⁵ Any significant threats to the health of ecosystems in the Damariscotta River pose a risk to the health of the Town's Bald Eagle population as well.

While invasive species have not yet been detected in Damariscotta, development and human activity provides ample opportunity to introduce new plants and animals to local ecosystems. Roadside erosion-control plantings, construction, and even vehicles traveling from outside areas can all inadvertently bring invasive species. Roadways also provide an avenue for animals to travel to new ecosystems they might not otherwise have access to. Climate change may make the introduction of non-native species inevitable as migration patterns shift across the eastern United States.

Road collisions pose a threat to the population of local species, particularly amphibians, birds, and small mammals. Deer wintering areas are critical habitat for white-tailed deer living in Maine, as they provide refuge from harsh weather and deep snow. Roads near wintering areas pose the highest risk of collisions that are fatal both to wildlife and to drivers.¹⁶ Russell Lane (off of Bristol Road) partially cuts through the Town's largest deer wintering area, south of Castner Brook Community Forest. The other two known wintering areas, which are located just north of Biscay Road, are surrounded by roads on most sides, a hazard to both deer and drivers during migration periods that also threatens to isolate migrating deer from potential food and shelter.¹⁷

In addition to increasing fatalities to local wildlife, roads provide a consistent source of runoff pollution as stormwater carries off sediments, road salt, and heavy metals directly into adjacent ecosystems. Roads also fragment habitats by creating dangerous barriers for terrestrial animals. The increased danger, as well as noise and air pollution, can indirectly hamper the use of ecosystems near areas of frequent activity as wildlife search for more suitable locations.¹⁸

¹³ Per Maine Department of Inland Fisheries & Wildlife determination.

¹⁴ Per Maine Natural Areas Program determination.

¹⁵ "Forest Management Recommendations for Bald Eagles," (Maine Department of Inland Fisheries & Wildlife).

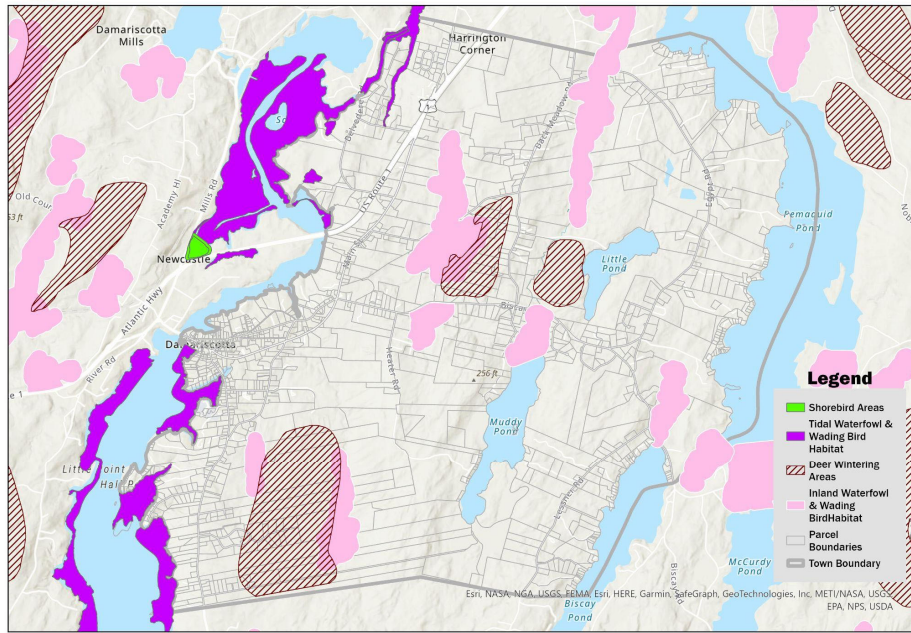
¹⁶ "Living on the Edge: White-tailed Deer at the Northern Range Limit," (Maine Department of Inland Fisheries & Wildlife).

¹⁷ "Living on the Edge: White-tailed Deer at the Northern Range Limit," (Maine Department of Inland Fisheries & Wildlife).

¹⁸ "Conserving Wildlife On and Around Maine's Roads," a joint publication of Beginning with Habitat, Maine Audubon, and Maine Department of Transportation.



Animal Habitats in the Region



Source: Maine Geolibary/Maine Department of Inland Fisheries & Wildlife.

Commented [2]: Again, maps will be made larger in final plan

Erosion and Landslide Risk

Degradation of mud flats and wetland habitats, which act as natural buffers to slow erosion, can increase the risk of landslides. In addition to threatening the integrity of shoreline structures, a large enough landslide threatens to damage nearby habitats and release large amounts of sediment and pollutants that can significantly impact water quality. In 2001, the Maine Geological Survey mapped out the erosion potential of shoreline along the Damariscotta River, finding land at risk of potential landslide south of Days Cove, along Cottage Point, and the coast off of Hog Island.¹⁹ Additionally, one stretch of coastal bluff near the southern border of town along the Damariscotta River was found to be highly unstable.²⁰

While no shoreline was found at significant risk of erosion, that may have changed in the years since the last available study in 2001. Properties near the Damariscotta River, especially those built before the

¹⁹ Stephen M Dickson, *Coastal landslide hazards in the Damariscotta quadrangle*, Maine, Maine Geological Survey, Open-File Map 01-514, map, scale 1:24,000, 2001 https://digitalmaine.com/mgs_maps/266/

²⁰ Thomas et. al., *Coastal bluffs in the Damariscotta quadrangle, Maine*, Maine Geological Survey, Open-File Map 02-185, map, scale 1:24,000, 2002, https://digitalmaine.com/mgs_maps/513/

adoption of the Town's Shoreland Zoning Ordinance that were therefore exempt from its regulations of construction near waterways, are at increased risk of causing landslides.

Regulatory Measures

The Town of Damariscotta does not have a Parks Department, but works closely with Coastal Rivers Conservation Trust (CRCT) to maintain the health of Damariscotta's habitats and wildlife. CRCT oversees the majority of the conserved land in Town. In addition to conserving land, CRCT also restores ecosystem health where possible, one example being the restoration of wetlands on the shores of the Great Salt Bay Farm in 1997. The Town also collaborates with the Great Salt Bay Sanitary District, the community's primary source of drinking water, to limit development in the Little Pond watershed, and works with the Maine Department of Inland Fisheries and Wildlife to minimize the risk of bacterial contamination in Little Pond during the restocking of Brook Trout. Damariscotta and neighboring Newcastle have also formed a joint Shellfish Conservation Committee and developed a Shellfish Conservation Ordinance to protect the health of their shared mudflat ecosystems from human activity and overfishing by shellfish harvesters. (For more information on shellfish and mudflat conservation efforts, please reference the Marine Resources section of this Plan.)

The Town's Site Plan Review Ordinance requires a stormwater management plan and an erosion and sediment control plan for new construction subject to the Ordinance.²¹ This is meant to minimize the risk of contamination to nearby water sources. Damariscotta also implemented a Shoreland Zoning Ordinance,²² which established all land within 75 feet of a high water line as a Stream Protection District, and all land within 250 feet of a coastal or freshwater wetland ecosystem as a Resource Protection District. This Ordinance regulates areas where development would adversely affect water quality, productive habitat, biologic ecosystems, or quality of scenic views. Any new construction in these sensitive areas must partially re-establish trees and local vegetation removed during construction to ensure the retention of natural stormwater buffers.

The Shoreland Zoning Ordinance, adopted to be consistent with the State's Chapter 1000 guidelines, limits commercial land uses in order to prevent contamination from fertilizers, petrol products, chemical, heavy metals, or other industrial pollutants. Any construction or natural resource harvesting must provide an erosion and sediment control plan to ensure minimal threat of runoff. Minimizing threats to water quality protects the health of nearby wetland ecosystems and the species relying on them.

Overarching Policies

State Goals

1. To protect the State's other critical natural resources, including without limitation, wetlands, wildlife and fisheries habitat, sand dunes, shorelands, scenic vistas, and unique natural areas.

²¹ See the Town's adopted Site Plan Review Ordinance.

²² See the Town's adopted Shoreland Zoning Ordinance.

Local Goals

1. Identify and protect critical natural areas in the community.
2. Continue to coordinate with neighboring communities, Coastal Rivers Conservation Trust, and other regional and state agencies to protect shared natural resources.

SMART Strategies

- Work with willing landowners near areas such as Salt Bay and Oyster Creek to permanently protect undeveloped areas, such as through conservation easements or similar.
- Work with Coastal Rivers Conservation Trust to determine an inventory of possible rare species in Oyster Creek's salt marsh and act to conserve this land.
- Monitor for invasive plant and animal species, and stay updated on species migration trends in Maine as a response to climate change.
- Consider alternatives to wastewater outfalls that impair quality of shellfish beds and wetland habitats.
- Use available Beginning with Habitat mapping to steer development away from important habitats and any large blocks of undeveloped land.
- Identify locations on roadways, culverts, and bridges that can be restored or retrofitted with wildlife crossing structures to improve wildlife movement, such as the deer wintering regions along Biscay Road
- Use only native species for roadside plantings, erosion control, and slope stabilization. Plant maintenance-free native wildflowers and other plants along roadsides to prevent non-native plant species from invading.
- Consider deer wintering area mapping when planning future road constructions. Contact the local DEP office for all permitting information required.
- Incentivize timber harvesting landowners to sustain quality deer wintering habitat.
- Consider adoption of a pesticide/fertilizer ordinance to minimize runoff from farmland and yards

Commented [3]: At this point, this is simply a placeholder with my own notes/recommendations (+ the State's). We will discuss local policies, goals and strategies following the conclusion of public engagement events to ensure that public input is included

F. NATURAL & MARINE RESOURCES

NATURAL & CRITICAL NATURAL RESOURCES

The Maine Department of Fisheries and Wildlife (MDIF&W) manages the State's Beginning With Habitat: Conserving Maine's Natural Landscape for Plants, Animals and People program (BwH), which consolidates natural resources data from federal and state agencies for use by Maine municipalities among others. In May 2013 Damariscotta received its municipal BwH publication in both hardcopy and on a CD. This publication is adopted herein as part of the 2014 Damariscotta Comprehensive Plan, Volume II – Appendices on Inventory & Analysis including inventory maps (updated in 2014) for Damariscotta:

Map 1: Water Resources & Riparian Habitats

Map 2: High Value Plant & Animal Habitats

Map 3: Undeveloped Habitat Blocks & Habitat Connections

Map 7: Wetlands Characteristics

Map 8: USFWS Priority Trust Species Habitats {USFWS = US Fish & Wildlife service}

Regional Map: Building A Regional Landscape - Damariscotta

The hardcopy and CD of Damariscotta's BwH document is available at the Planning Office at Town Hall. The electronic version may be accessed at: [<townofdamariscotta.com>](http://townofdamariscotta.com) → Government → Town Planning Documents → Comprehensive Plan → Beginning With Habitat.

The inventories and analyses of the above maps have been absorbed into and informed the development of the Future Land Use Plan (FLUP) in Volume I of the Comprehensive Plan in helping to determine areas for conservation and growth areas for development opportunities. See Map 5.H.2: Natural Resources and Hazards in Volume I or on the Town website: [<townofdamariscotta.com>](http://townofdamariscotta.com) → Government → Town Planning Documents → Comprehensive Plan → UPDATED 6/4**2014 DAMARISCOTTA COMPREHENSIVE PLAN (Vol. 1)** → Map 5.H.2

Due to Great Salt Bay's mix of brackish tidal influenced habitats, it supports an extraordinarily rich and productive mix of species. The state has thusly designated the Damariscotta River from Fort Island in Boothbay upstream, including Great Salt Bay, as a ***Focus Area of Statewide Ecological Significance***. The environmental qualities found within the Damariscotta drainage area in Damariscotta shown on the BWH (Beginning With Habitat) Maps above are:

Water Resources & Riparian Habitats: (Map 1)

- Salt water marshes
- Fresh water wetlands
- Riparian Habitat
- Shellfish Growing Areas

High Value Plant & Animal Habitats: (Map 2)

- Mixed saltmarsh – Oyster Creek
- Two Bald Eagle sites on the Damariscotta river – species of special concern
- Inland Deer wintering areas
- Tidal Waterfowl/Wading Bird areas
- Inland (fresh water) Waterfowl/Wading Bird areas

Undeveloped Habitat Blocks & Habitat Connections: (Map 3) {2,402 acres = 30% of Town}

- Inland north of Biscay Road between Route One and Back Meadow Brook = 772 acres
- Inland north of Biscay Road, around Little Pond over to Egypt Road = 774 acres
- Inland between Egypt Road and Pemaquid Pond = 318 acres

- Inland south of Biscay Road between Bristol Road and Paradise Pond = 386 acres
- Inland south of Biscay Road between Paradise Pond and Biscay Pond = 252 acres

Wetlands Characteristics/Functions: (Map 7)

Great Salt Bay – Runoff/Floodflow alteration; Erosion control/sediment retention; Finfish & shellfish habitat; Plant & animal habitat

Damariscotta River - Finfish & shellfish habitat; Plant & animal habitat; Aquatic Bed (floating or submerged aquatic vegetation) open water

Inland Emergent vegetated wetlands – Freshwater Plant and animal habitat; Finfish habitat; Runoff/floodflow alteration

Forested/Shrub-scrub wetlands – Freshwater Plant and animal habitat; Finfish habitat; Runoff/floodflow alteration

USFWS Priority Trust Species Habitats: (Map 8)

Federally endangered, threatened or candidate species; Migratory birds, Sea-run fish and marine fish showing declining population trends; species of concern for which high value habitats have the potential to support the following:

Birds: American bittern, American black duck, American woodcock, Bald eagle, Baltimore oriole, Black-bellied plover, Black-throated blue warbler, Canada warbler, Chestnut-sided warbler, Common loon, Killdeer, Least sandpiper, Marsh wren, Northern flicker, Osprey, Pied-billed grebe, Scaup (greater and lesser), Short-billed dowitcher, Solitary sandpiper, Surf scoter, Veery, Wilson’s Snipe, Wood duck, Wood thrush.

Fisheries: Alewife, American eel, Atlantic salmon, Atlantic sturgeon, Blueback herring, Shortnose sturgeon.

Beginning With Habitat: Great Salt Bay & Damariscotta River Estuary Focus area of Statewide Ecological Significance

Characteristic Species - marine worms; shellfish including aquaculture of oysters; soft-shell clam; eelgrass beds; diadromous fish including the large alewife migration to Damariscotta Lake through the fish ladder at Damariscotta Mills on Great Salt Bay; Bald eagle; Horseshoe crabs; small mouth and large mouth bass and trout in the freshwater ponds and tributaries of Great Salt Bay and Damariscotta River; Tidal wading Bird and waterfowl habitat.

Conservation considerations: (see Beginning With Habitat → Salt Bay Focus Area of Statewide Ecological Significance)

- Salt Bay would benefit from 250 foot shoreline buffer to prevent erosion and invasive species growth;
- Employ a range of methods to control invasive species;
- Agricultural runoff, shoreline development and aquaculture management to limit disruption of nutrient cycling in the Bay;
- Employ various methods to protect eelgrass; limit nitrogen loading causing algal shading- Ag & lawns;
- Protect marine worms by limiting to larger size and remove intertidal mussel dragging;
- Protect horseshoe crabs from habitat loss and shoreline development;
- Protect water quality from changes in salinity, temperature, turbidity to protect habitats;
- Protect from point and non-point pollution that can change faunal communities in tidal areas; oil spills can disrupt functioning biological systems;
- Filling, dredging, dragging and other major human disturbances can disrupt floral and faunal systems and the food web;
- Contact MDIFW (Maine Dept. of Inland Fisheries & Wildlife) for BMPs (best management practices) re: forestry and construction activities along the shoreline;
- Conserve low-lying coastal areas to accommodate projected 2 foot sea-level rise over next 50 years as coastal ecological systems migrate inland.

Ecological Services of the Focus Area: (from Beginning With Habitat → Salt Bay Focus Area of Statewide Ecological Significance)

- Provides high levels of biodiversity and productivity.
- Serves as migratory stopover for birds.
- Provides habitat for fish and shellfish.
- Supports eelgrass and associated eelgrass values.

Economic Contributions of the Focus Area: (from Beginning With Habitat → Salt Bay Focus Area of Statewide Ecological Significance)

- Attracts tourism for wildlife observation, paddling, hunting, angling, shell midden observation.
- Supports local marine resource industries including aquaculture.
- Contributes to recreational value of the area, including nearby coastal areas, by protecting water quality, fisheries and wildlife habitat.
- Provides scenic vistas that raise property values.
- Provides valuable open space for local residents – a river walk from DRA (Damariscotta River Association) Museum under Rt. One bridge to village harbor is recommended in this plan.

MARINE RESOURCES

Damariscotta River Association’s Report on The Health of the Damariscotta River Estuary Watershed

The Damariscotta River Watershed covers an area of 103 square miles, stretching from the headwaters of Damariscotta Lake to the Gulf of Maine. The watershed includes at least 25 upland natural community types such as maritime spruce-fir forests, salt marsh habitat, vernal pools and oak hardwood forests. Everything on the land, or in the water within the watershed, has the potential to drain into the estuary. The estuary is the region in which the fresh and salt water mix from the head-of-tide in Damariscotta Mills to Fort Island, where the impact of fresh water becomes negligible. Estuaries provide a wide variety of bird nesting grounds, migration stop-over locations, fish migration habitat, aesthetic and recreational value for residents and tourists, and much more. In addition, the combined value of fisheries and businesses associated with the Damariscotta River Estuary annually was determined to be \$13 million in 1994 (Damariscotta River Estuary Project).

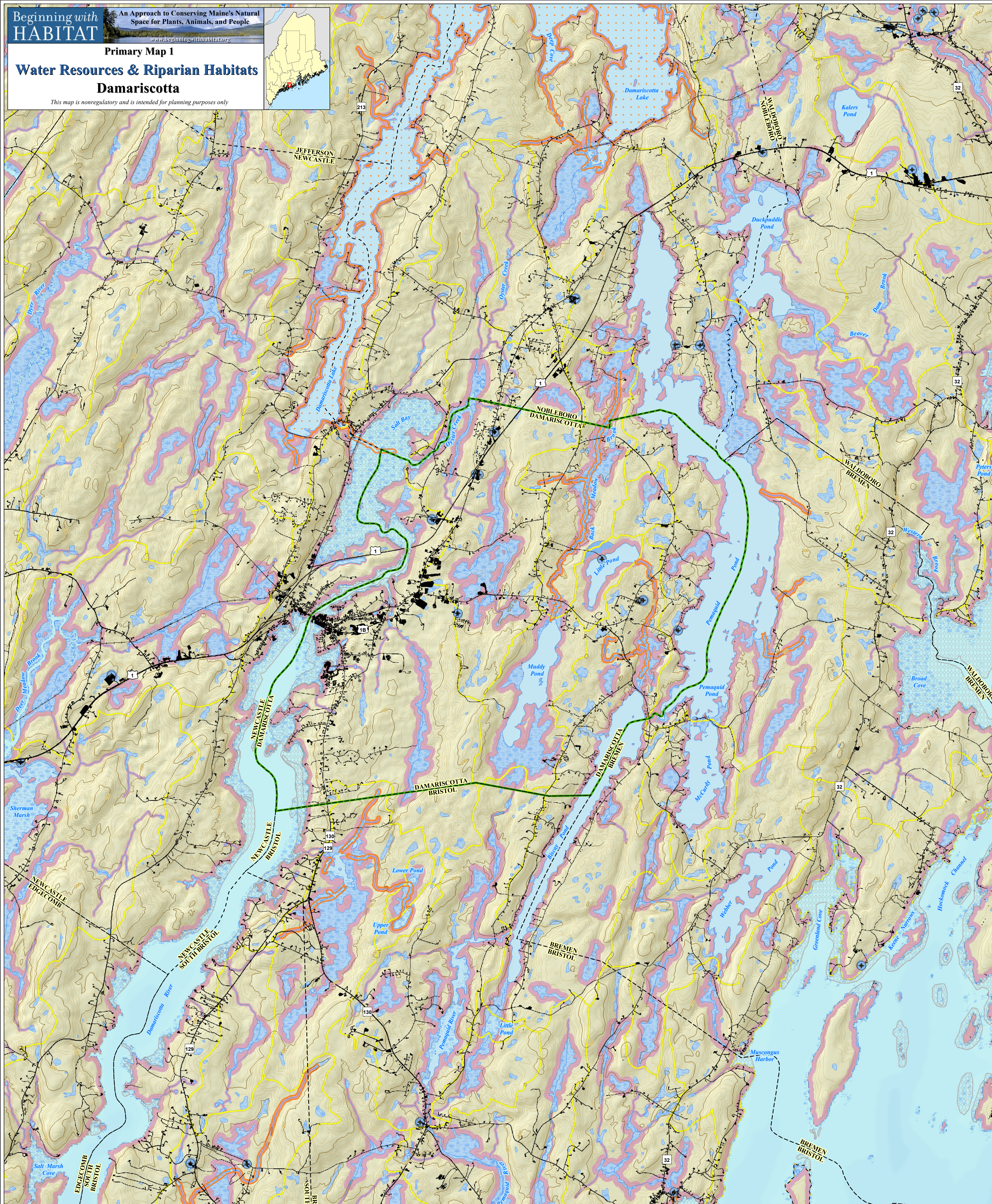
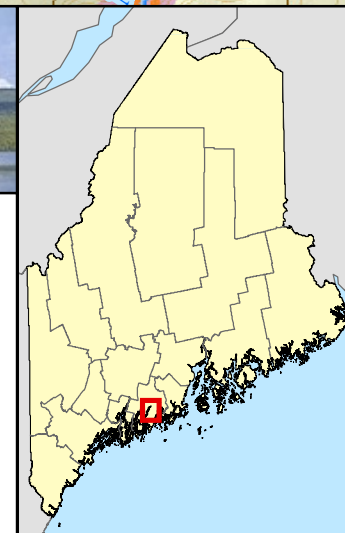
The good news is the Damariscotta River Estuary is in relatively good health. The bad news is that there are several notable threats that have appeared on the horizon which require careful monitoring. Additionally, a significant amount of information on the ecological health of the estuary is unknown because no supporting data yet exists.

This report card is intended to gather a large amount of scientific data from a variety of sources into one concise document for the public. This document uses standards or management goals set by the State of Maine, or another scientific authority, against which the data has been compared.

REPORT CARD KEY

Grade	Reason (for pollution parameter)	Reason (for species listed)
A	Exceeds standard and no pollution evident	Exceeds carrying capacity/management goal and population stable
B	Exceeds standards but some pollution evident	Exceeds carrying capacity/management goal in successive recent years
C	Meets standards with allowable amount of	Meets carrying capacity/management goal

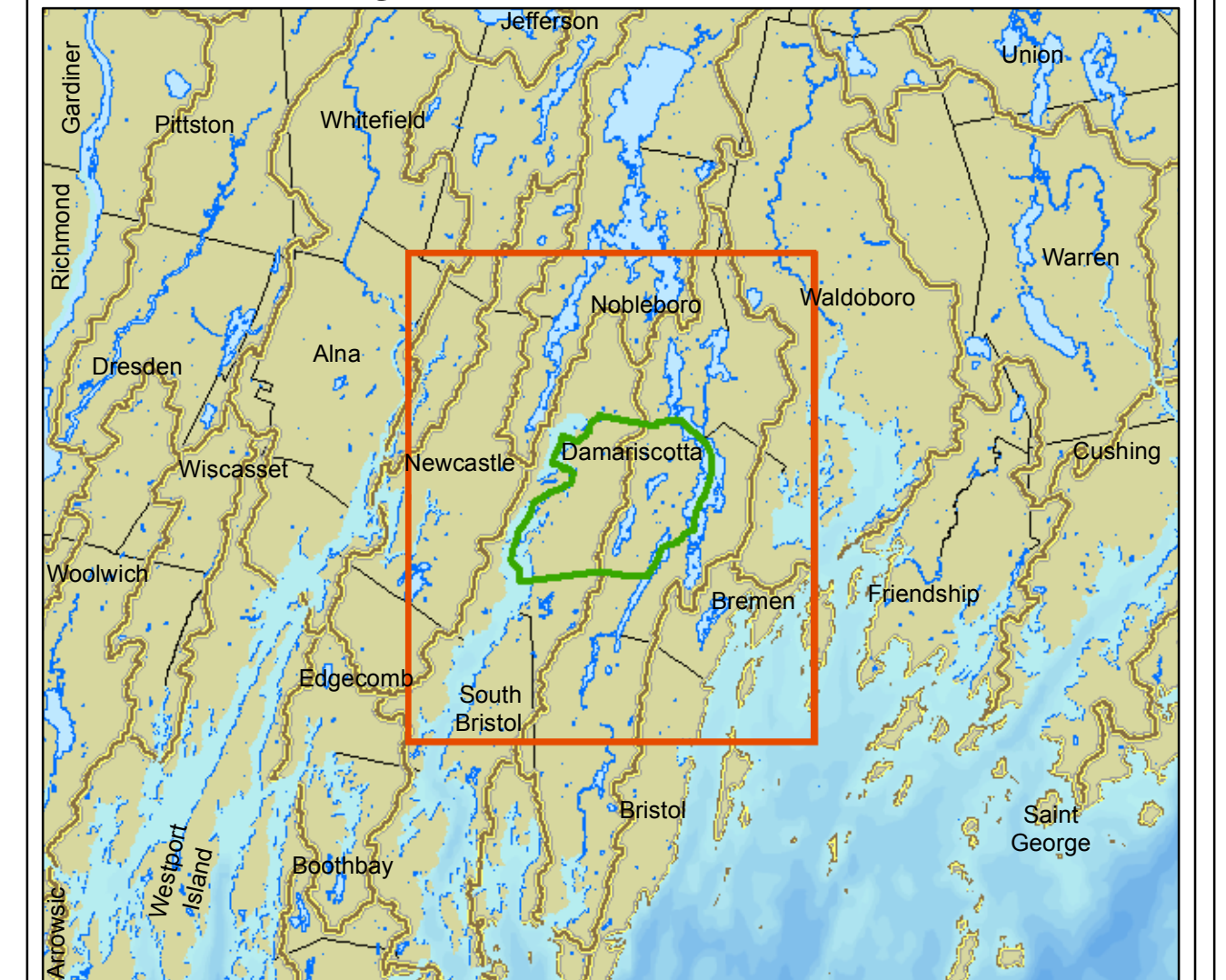
This map is nonregulatory and is intended for planning purposes only



LEGEND

- This map depicts riparian areas associated with major surface water features and important public water resources. This map does not depict all streams or wetlands known to occur on the landscape and should not be used as a substitute for on the ground surveys. This map should be used as a planning reference only and is intended to illustrate the natural hydrologic connections between surface water features. Protecting riparian habitats protects water quality, maintains habitat connections, and safeguards important economic resources including recreational and commercial fisheries.
- Selected Town or Area
 - Organized Township Boundary
 - Unorganized Township
 - Developed - Impervious surfaces including buildings and roads
 - Drainage divides - These are the smallest hydrologic units mapped in Maine. They contain watershed boundaries for most ponds and rivers in Maine.
 - NWI Wetlands - National Wetlands Inventory (NWI) uses aerial photographs to approximate wetland locations. NWI data is not a comprehensive mapping of wetland resources and typically under-represents the presence of wetlands on the landscape. The presence of wetlands needs to be determined in the field prior to conducting activities that could result in wetland disturbance.
 - Riparian Habitat - depicted using common regulatory zones including a 250-foot-wide strip around Great Ponds (ponds > 10 acres), rivers, coastline, and wetlands > 10 acres and a 75-foot-wide strip around streams. Riparian areas depicted on this map may already be affected by existing land uses.
 - Shellfish Growing Areas - The Maine Department of Marine Resources maps growing areas for economically important shellfish resources. This map depicts softshell and hard clam resources in order to illustrate the relation of these resources to streams and shoreline areas vital to their conservation.
 - Brook Trout Habitat - Streams and ponds, buffered to 100 feet, where wild Brook Trout populations have been documented, or managed to enhance local fisheries.
 - + Public Water Supply Wells
 - Source protection area - Buffers that represent source water protection areas for wells and surface water intakes that serve the public water supply. Their size is proportional to population served and/or by the type of water supply system. These buffers range from 300 to 2,500 feet in radius.
 - Aquifers - flow of at least 10 gallons per minute

Regional View of Watersheds

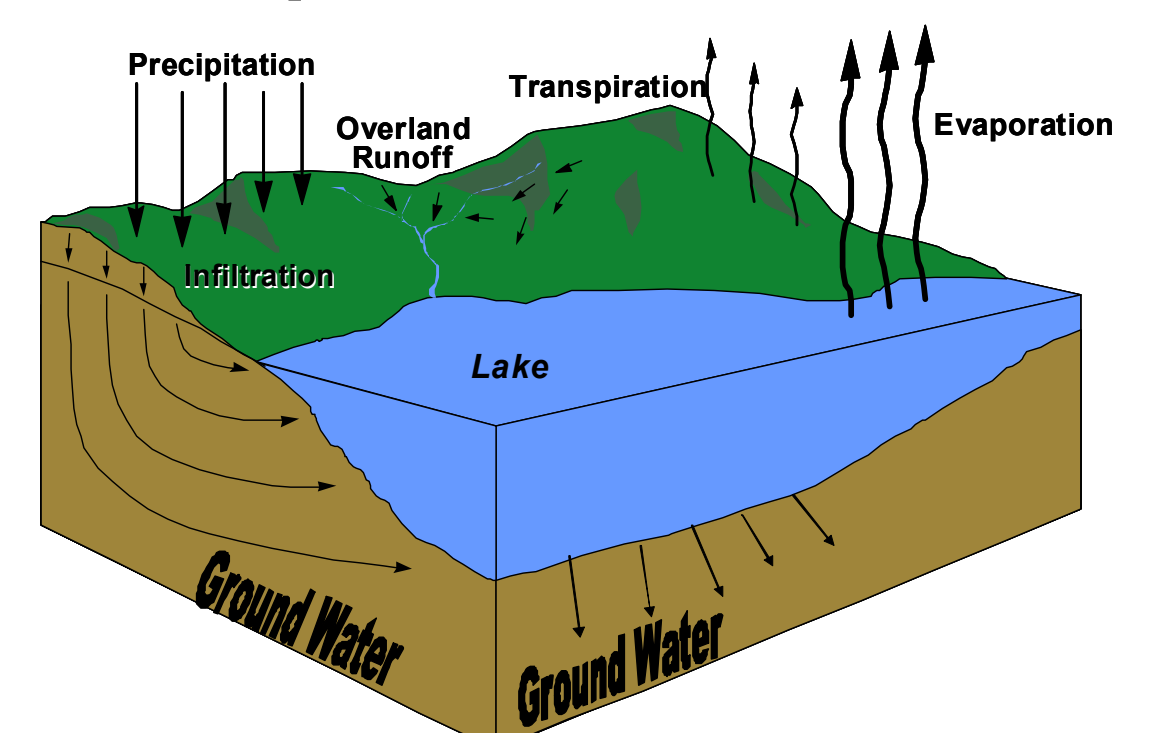


A watershed includes all of the land that drains to a common waterbody. The areas within the watershed are linked ecologically by the water, sediment, nutrients, and pollutants that flow through them. For the purpose of mapping "hydrological units," watersheds are often grouped into larger drainages or divided into smaller ones depending on the map's scale. Drainage divides (shown on main map as yellow lines), are the smallest hydrological units and generally drain into small ponds, wetlands, or streams. These units are grouped into subwatersheds (HU12) and are represented on the inset map above by the yellow-brown outlines.

- Main Map Extent
- Selected Town or Area
- Subwatersheds

1 inch = 4 miles

Relationship of Ground Water and Surface Water



Precipitation is the source of all water. Surface water and ground water are related. Drinking water can come from either source. Ground contaminants can affect both. The relationship between ground water and surface water is part of the hydrologic cycle. Precipitation that falls from the atmosphere as rain or snow reaches the land surface and recharges rivers, lakes, wetlands, and other surface bodies of water directly through overland runoff. Surface water also seeps into the ground through infiltration and eventually reaches the ground water, or through evaporation, returns to the atmosphere. Water evaporates from leaves and stems of plants through transpiration.

Shoreland Zoning

Maine's Mandatory Shoreland Zoning Act is intended to protect water quality, conserve wildlife habitat, and preserve the natural beauty of Maine's shoreline areas. Successful implementation requires local awareness of and appreciation for surface water resources and effective enforcement of setback and buffer requirements.

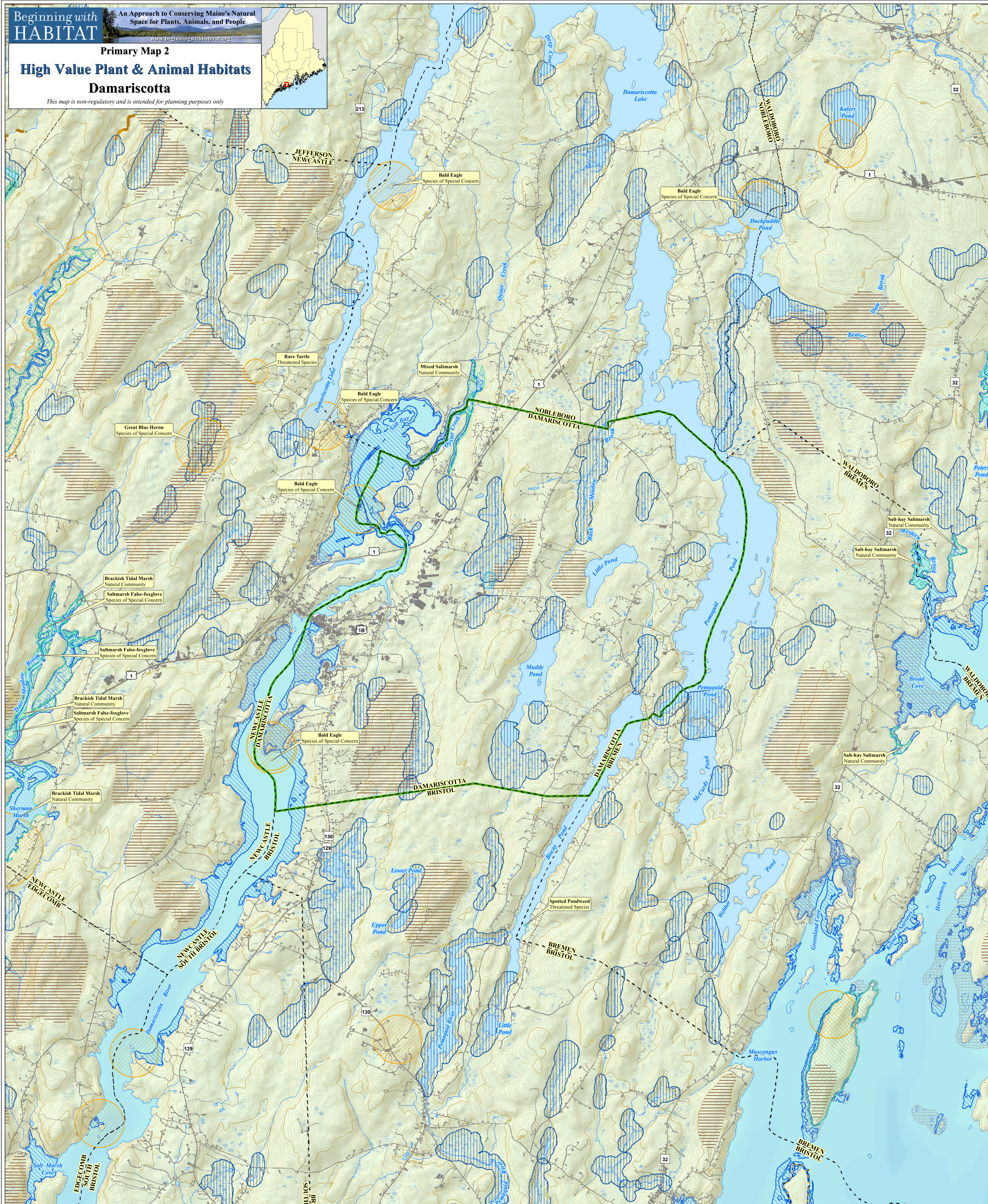
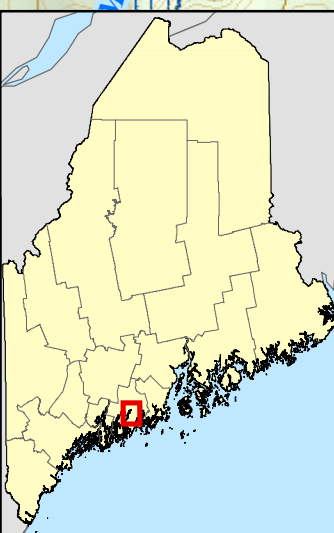
- At a minimum, Maine's shoreland zones include all land within:
- 250 feet of the high-water line of any pond over 10 acres; any river that drains at least 25 square miles, and all tidal waters and saltwater marshes;
 - 250 feet of a freshwater wetland over 10 acres (except "forested" wetlands); and
 - 75 feet of a stream that is either an outlet stream of a great pond, or located below the confluence of two perennial streams as depicted on a USGS topographic map.

Shoreland zoning encourages towns to provide greater protection to their local water resources by applying shoreland zone protections to additional resource types such as smaller streams and wetlands, and rare terrestrial features. For specific guidance regarding Maine's Mandatory Shoreland Zoning Act contact the Dept. of Environmental Protection Shoreland Zoning Unit: 207-287-3901 (Augusta), 207-822-6300 (Portland), 207-941-4116 (Bangor), www.maine.gov/dep/biwd/docstnd/szpage.htm

Data Sources

DATA SOURCE INFORMATION	SHELLFISH
TOWNSHIP BOUNDARIES	Maine Department of Marine Resources; softshell_clams_hard_clams
ROADS	RIPARIAN BUFFERS
Maine Office of GIS, Maine Department of Transportation (2015); medotpub	Maine Office of GIS, Maine Natural Areas Program (2011)
HYDROLOGY	WELLS, WELL BUFFERS
USGS National Hydrography Dataset (NHD) (2012)	Maine Office of GIS, Maine Department of Human Services-Drinking Water Program (2011); wells_wellbuf
DEVELOPERS	AQUIFERS
Maine Office of GIS, Maine Department of Inland Fisheries and Wildlife (2015); openview_change_2015	Maine Office of GIS, Maine Geological Survey (2011); aquifer_polygons
NATIONAL WETLANDS INVENTORY	DRAINAGE DIVIDES
U.S. Fish & Wildlife Service (2015); NWI	Maine Office of GIS (1994); medr/dvd
DATA SOURCE CONTACT INFORMATION	BROOK TROUT HABITAT
Maine Office of GIS: http://www.maine.gov/mgis/	Maine Department of Inland Fisheries & Wildlife (2011)
Maine Natural Areas Program: http://www.maine.gov/dac/nmap/index.html	
Maine Department of Marine Resources: http://www.maine.gov/dmr/	
Maine Department of Transportation: http://www.maine.gov/dot/	
Maine Geological Survey: http://www.maine.gov/doc/mgs/mgs.htm	
Maine Department of Inland Fisheries & Wildlife: http://www.maine.gov/wildlife/index.html	

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LEGEND

Beginning with Habitat (BwH) is a voluntary tool intended to assist landowners, resource managers, planners, and municipalities in identifying and making informed decisions about areas of potential natural resource concern. This data includes the best available information provided through BwH's coalition partners as of the map date, and is intended for information purposes only. It should not be interpreted as a comprehensive analysis of plant and animal occurrences or other local resources, but rather as an initial screen to flag areas where agency consultation may be appropriate. Habitat data sets are updated continuously as more accurate and current data becomes available. However, as many areas have not been completely surveyed, features may be present that are not yet mapped, and the boundaries of some depicted features may need to be revised. Local knowledge is critical in providing accurate data. If errors are noted in the current depiction of resources, please contact our office. Some habitat features depicted on this map are regulated by the State of Maine through the Maine Endangered Species Act (Essential Habitats and threatened and endangered species occurrences) and Natural Resources Protection Act (Significant Wildlife Habitat). We recommend consultation with MDIFW Regional Biologists or MNPAP Ecologists if activities are proposed within resource areas depicted on this map. Consultation early in the planning process usually helps to resolve regulatory concerns and minimize agency review time. For MDIFW and MNPAP contact information, visit <http://www.beginningwithhabitat.org/contacts/index.html>.

- Organized Township Boundary
- Unorganized Township
- Selected Town or Area of Interest
- Developed: Impervious surfaces such as buildings and roads

Rare, Threatened, or Endangered Wildlife

- Known rare, threatened, or endangered species occurrence and/or the associated habitats based on species sightings.

Consult with a MDIFW regional biologist to determine the relative importance and conservation needs of the specific location and supporting habitat. For more information regarding individual species visit our website, http://www.maine.gov/ifw/wildlife/species/essential_species/state_list.htm, for species specific fact sheets.

The Federal Endangered Species Act requires actions authorized, funded, or carried out by federal agencies be reviewed by the U. S. Fish and Wildlife Service. If your project occurs near an occurrence of the Atlantic Salmon, Roseate Tern, Piping Plover, Canada Lynx, New England Cottontail, Fish's Lousewort, or Small-whorled Pagonia contact the Maine Field Office, USFWS, 1168 Main St., Old Town, ME 04468.

Rare or Exemplary Plants and Natural Communities

- Rare Plant Locations

Known rare, threatened, or endangered plant occurrences are based on field observations. Consult with a Maine Natural Areas Program (MNPAP) Ecologist to determine conservation needs of particular species. For more information regarding rare plants, the complete list of tracked species and fact sheets for those species can be found at: <http://www.maine.gov/doc/nim/mmap/features/plantlist.htm>

- Rare or Exemplary Natural Community Locations

The MNPAP has classified and distinguished 98 different natural community types that collectively cover the state's landscape. These include such habitats as floodplain forests, coastal bogs, alpine summits, and many others. Each type is assigned a rarity rank of 1 (rare) through 5 (common). Mapped rare natural communities or ecosystems, or exemplary examples of common natural communities or ecosystems, are based on field surveys and aerial photo interpretation. Consult with an MNPAP Ecologist to determine conservation needs of particular communities or ecosystems.

Essential Wildlife Habitats

- Roseate Tern Nesting Area or Piping Plover-Least Tern Nesting, Feeding, & Brood-Rearing Area

Maine's Department of Inland Fisheries & Wildlife (MDIFW, www.state.me.us/ifw) maps areas currently or historically providing habitat essential to the conservation of endangered or threatened species as directed by the Maine Endangered Species Act (12 M.R.S.A., Chapter 925, Subchapter 3, Sections 12804 and 12806) and regulations (MDIFW Rules, Chapter 8.05). Identification of Essential Habitat areas is based on species observations and confirmed habitat use. If a project occurs partly or wholly within an Essential Habitat, it must be evaluated by MDIFW before state and/or municipal permits can be approved or project activities can take place.

Significant Wildlife Habitats

- Candidate Deer Wintering Area

Forested area possibly used by deer for shelter during periods of deep snow and cold temperatures. Assessing the current value of a deer wintering area requires on-site investigation and verification by IF&W staff. Locations depicted should be considered as approximate only.

- Inland Waterfowl / Wading Bird

Freshwater breeding, migration/staging, and wintering habitats for inland waterfowl or breeding, feeding, loafing, migration, or roosting habitats for inland wading birds.

- Seabird Nesting Island

An island, ledge, or portion thereof in tidal waters with documented, nesting seabirds or suitable nesting habitat for endangered seabirds.

- Shorebird Areas

Coastal staging areas that provide feeding habitat like tidal mud flats or roosting habitat like gravel bars or sand spits for migrating shorebirds

- Tidal Waterfowl / Wading Bird

Breeding, migrating/staging, or wintering areas for coastal waterfowl or breeding, feeding, loafing, migrating, or roosting areas for coastal wading birds. Tidal Waterfowl/Wading Bird habitats include aquatic beds, eelgrass, emergent wetlands, mudflats, seaweed communities, and reefs.

- Significant Vernal Pools

A pool depression used for breeding by amphibians and other indicator species and that portion of the critical terrestrial habitat within 250 ft of the spring or fall high water mark. A vernal pool must have the following characteristics: natural origin, nonpermanent hydroperiod, lack permanently flowing inlet or outlet, and lack predatory fish.

Maine's Natural Resources Protection Act

Maine's Natural Resources Protection Act (NRPA, 1988) is administered by the Maine Department of Environmental Protection (MDEP; <http://www.maine.gov/dep/tw/dostand/nrpape.htm>) and is intended to prevent further degradation and loss of natural resources in the state, including the above Significant Wildlife Habitats that have been mapped by MDIFW. MDEP has regulatory authority over most Significant Wildlife Habitat types. The regional MDEP office should be consulted when considering a project in these areas.

Atlantic Salmon Spawning/Rearing Habitat

- Atlantic Salmon Rearing Habitat
- Atlantic Salmon Spawning Habitat
- Atlantic Salmon Limited Spawning Habitat

Mapped by Atlantic Salmon Commission (ASC) and US Fish & Wildlife Service (USFWS) from field surveys on selected Penobscot and Kennebec River tributaries and the Dennys, Ducktrap, East Machias, Machias, Pleasant, Narragagus, and Sheepscot Rivers.

Data Sources

DATA SOURCE INFORMATION

TOWNSHIP BOUNDARIES
 Maine Office of GIS: Metwp24 (2013)

ROADS
 Maine Office of GIS, Maine Department of Transportation: Meddotwp (2015)

HYDROLOGY
 U.S. Geological Survey National Hydrography Dataset (NHD) Maine (2012)

DEVELOPED
 Maine Office of GIS, Maine Department of Inland Fisheries and Wildlife, and multiple other agencies: Imperv (2015)

ESSENTIAL & SIGNIFICANT WILDLIFE HABITATS
 Maine Office of GIS, Maine Department of Inland Fisheries & Wildlife: DWA, ETSC, Ehlptm, Ehrtem, JWWH, Sm. Shorebird, TWWH (2003-2015)

RARE NATURAL COMMUNITIES & PLANTS
 Maine Natural Areas Program: MNPAP_ecs (2015)

ATLANTIC SALMON HABITAT
 Maine Office of GIS, Maine Atlantic Salmon Commission, U.S. Fish & Wildlife Service: Ashab3 (2013)

DATA SOURCE CONTACT INFORMATION

Maine Office of GIS: <http://www.maine.gov/igs/catalog>
 Maine Natural Areas Program: <http://www.maine.gov/nim/mmap/index.html>
 Maine Department of Inland Fisheries & Wildlife: <http://www.maine.gov/ifw/>
 U.S. Fish & Wildlife Service, Gulf of Maine Program: <http://gulfofmaine.fws.gov>
 Maine Atlantic Salmon Commission: <http://www.maine.gov/asc/>
 Maine Department of Transportation: <http://www.maine.gov/mdot/>

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Map Prepared by **Maine Department of Inland Fisheries & Wildlife**
 January 2016

Supported in part by **Maine Outdoor Heritage Fund** lottery ticket sales

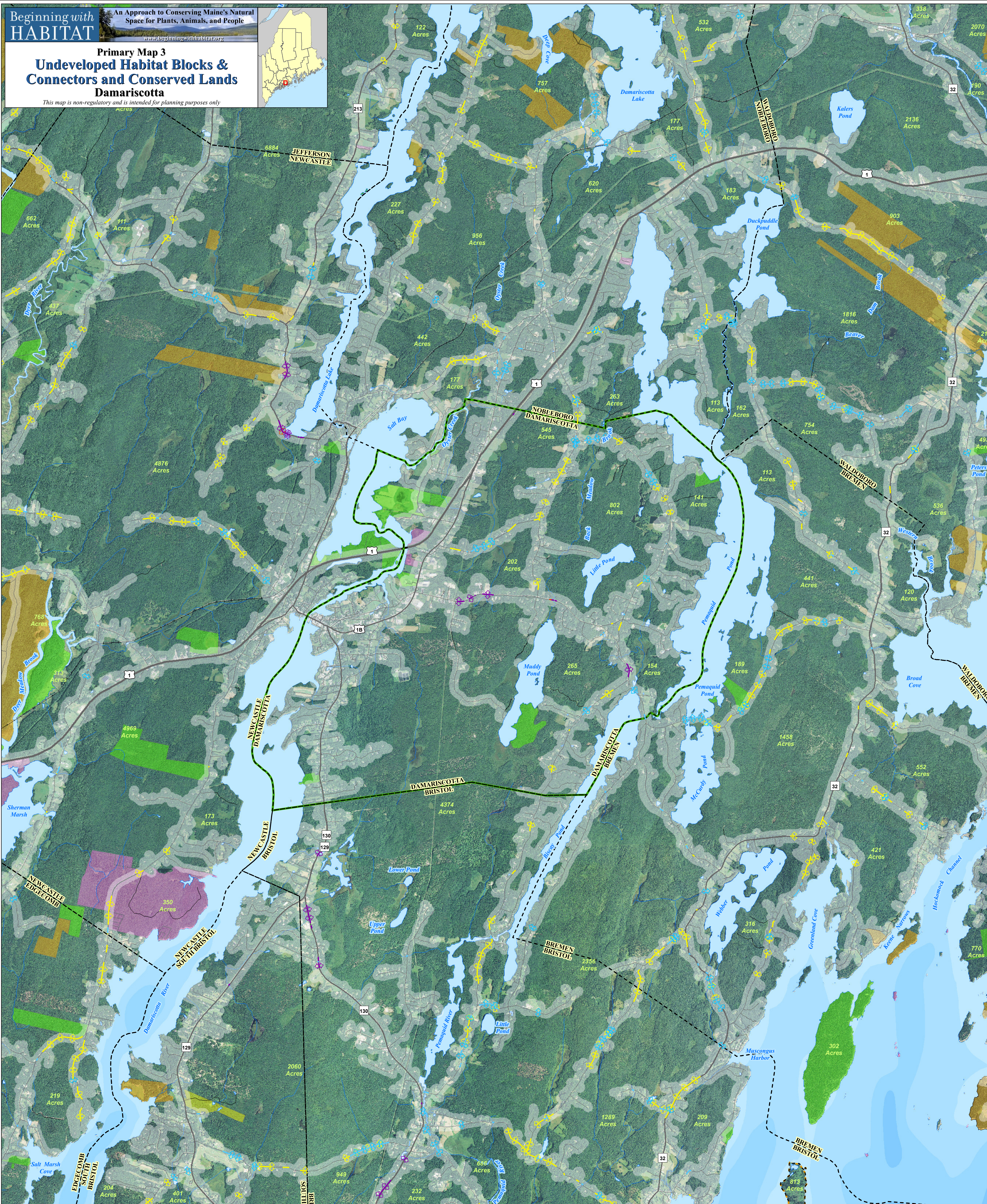
Supported in part by **Maine Conservation Fee funds**

THANK YOU

Logos for partner organizations: State of Maine, Maine Department of Environmental Protection, Maine Department of Inland Fisheries & Wildlife, Maine Department of Transportation, The Nature Conservancy, MAINE AUDUBON, Maine Coast Heritage Trust, MaineDOT, and others.

Scale bar: 5,000 Feet / 1,000 Meters, 2,500 Feet / 500 Meters, 0, 0.5, 1 Miles / Kilometers

1:24,000 Scale
 Projection: UTM 19N
 Datum: NAD 1983



LEGEND

This map highlights undeveloped natural areas likely to provide core habitat blocks and habitat connections that facilitate species movements between blocks. Undeveloped habitat blocks provide relatively undisturbed habitat conditions required by many of Maine's species. Habitat connections provide necessary opportunities for wildlife to travel between preferred habitat types in search for food, water, and mates. Roads and development fragment habitat blocks and can be barriers to moving wildlife. By maintaining a network of interconnected blocks towns and land trusts can protect a wide variety of Maine's species—both rare and common—to help ensure rich species diversity long into the future. Maintaining a network of these large rural open spaces also protects future opportunities for forestry, agriculture, and outdoor recreation.

- Organized Township Boundary
- Unorganized Township
- Selected Town or Area of Interest

Habitat Blocks

Development Buffer (pale transparency)
 250-500 foot buffer around improved roads and developed areas based on development intensity.

Undeveloped Habitat Block
 Remaining land outside of Development Buffers. Blocks greater than 100 acres are labeled with their estimated acreage.

Approximate Road Crossing Habitat Connections

Represented habitat connections identified through computer modeling highlight locations where quality habitat is likely to occur on both sides of a given road between undeveloped habitat blocks greater than 100 acres and between higher value wetlands. These representations are approximate and have not been field verified.

Undeveloped Block Connectors

Likely road crossing areas linking undeveloped habitat blocks greater than 100 acres. The threat of habitat fragmentation and animal mortality corresponds to traffic volume.

Yellow lines represent habitat road crossings with daily traffic volumes less than 2000 vehicles per day.

Red lines represent habitat road crossings with daily traffic volumes greater than 2000 vehicles per day.

Riparian Connectors

Likely crossing locations for wetland dependent species moving between waterways and wetlands divided by roads.

Blue lines represent riparian road crossings with daily traffic volumes less than 2000 vehicles per day.

Purple lines represent riparian road crossings with daily traffic volumes greater than 2000 vehicles per day.

Highway Bridge Connectors

Highway bridges along I-95 and I-295 that span riparian habitat connecting adjacent but separated habitat blocks. These are locations where species are likely to take advantage of infrastructure to move between habitat blocks.

Conserved Lands

The State of Maine's conserved lands database includes lands in federal, state, and non-profit ownership. It does not include many privately owned conservation lands, especially those protected by local land trusts, or town owned conservation lands. For the most accurate and current information about land ownership, consult with the local assessor and/or other local land management agencies. If public access potential to any of the properties displayed here is uncertain, landowners should be contacted to determine if permission is necessary.

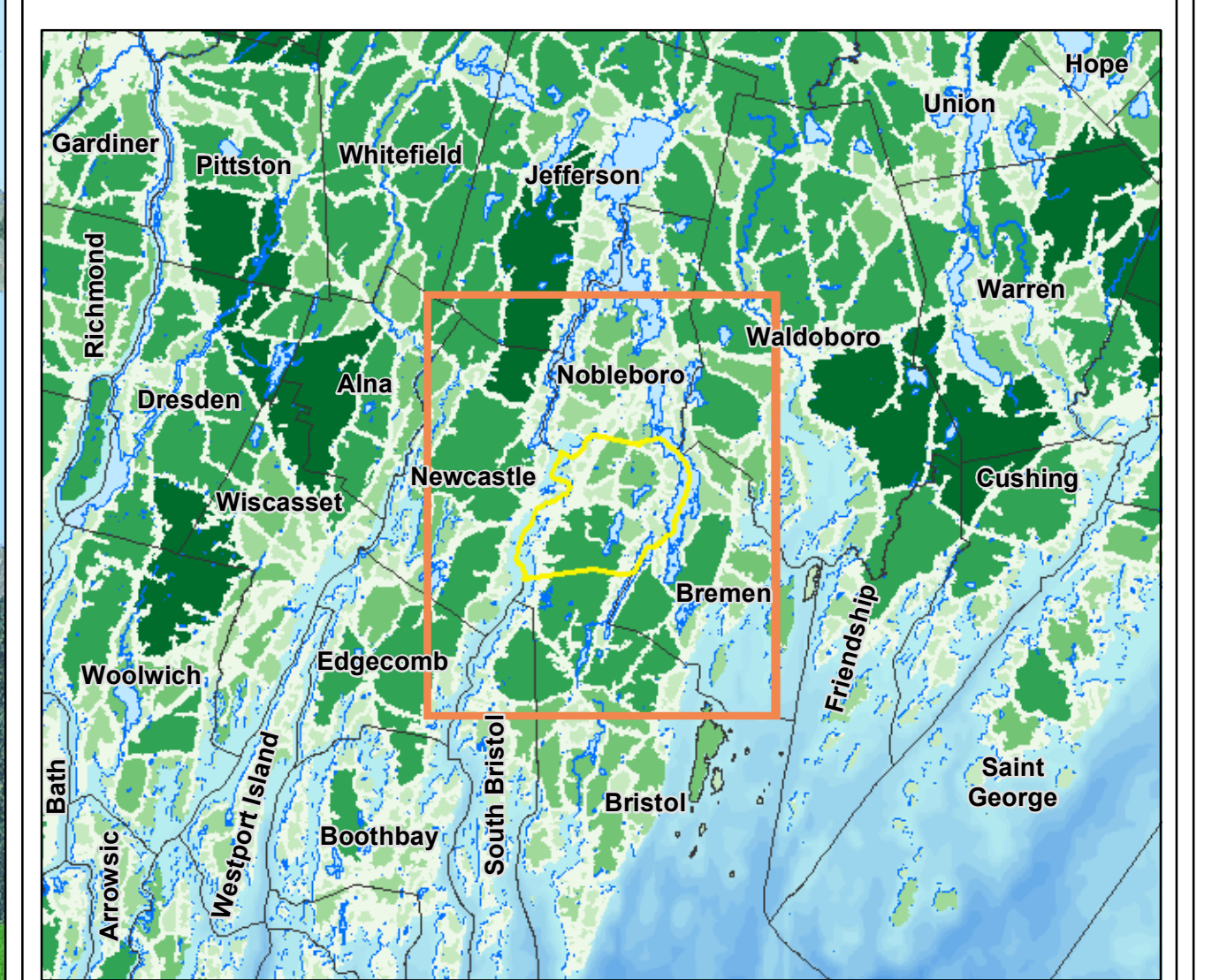
Ownership Type (transparent layers)

- Federal
National parks, forests, and wildlife refuges. (Includes Canadian conserved lands.)
- State
Wildlife Management Areas and other properties managed by the Department of Inland Fisheries and Wildlife, state parks, and parcels managed by the Bureau of Parks & Lands.
- Municipal
Town parks, athletic fields, community forests, etc.
- Private Conservation
Properties owned and managed by private (usually non-profit) organizations such as The Nature Conservancy, Maine Coast Heritage Trust, Trust for Public Land, and local land trusts.
- Easement
Voluntary legal agreements that allow landowners to realize economic benefit by permanently restricting the amount and type of future development and other uses on all or part of their property as they continue to own and use it.

Aerial Imagery

Aerial imagery is often the best tool available to visualize existing patterns of development and resulting changes in the natural landscape. By depicting undeveloped habitat blocks, habitat connectors and conserved lands with aerial photos, the map user can more easily identify opportunities to expand the size and ecological effectiveness of local conservation efforts.

Regional Undeveloped Blocks



- 0 - 250 acres
 - 250-500 acres
 - 500-1,000 acres
 - 1,000-5,000 acres
 - > 5,000 acres
- 1 : 325,000 1 inch equals 5 miles

Data Sources

DATA SOURCE INFORMATION
 TOWNSHIP BOUNDARIES
 Maine Office of GIS: metwp24 (2013)
 ROADS
 Maine Office of GIS, Maine Department of Transportation: medotpub (2015)
 HYDROLOGY
 U.S. Geological Survey: NHD_Maine (2012)
 UNDEVELOPED HABITAT BLOCKS, DEVELOPMENT BUFFER, CONNECTORS
 Maine Department of Inland Fisheries and Wildlife (2015)
 CONSERVATION LANDS
 Maine Department of Agriculture, Conservation, and Forestry, Land Use Planning Commission, Maine Department of Inland Fisheries and Wildlife:
 Conserved Lands (2015)
 AERIAL IMAGERY
 U.S. Department of Agriculture: NAIP 2013 - state-wide 1-meter color orthoimagery

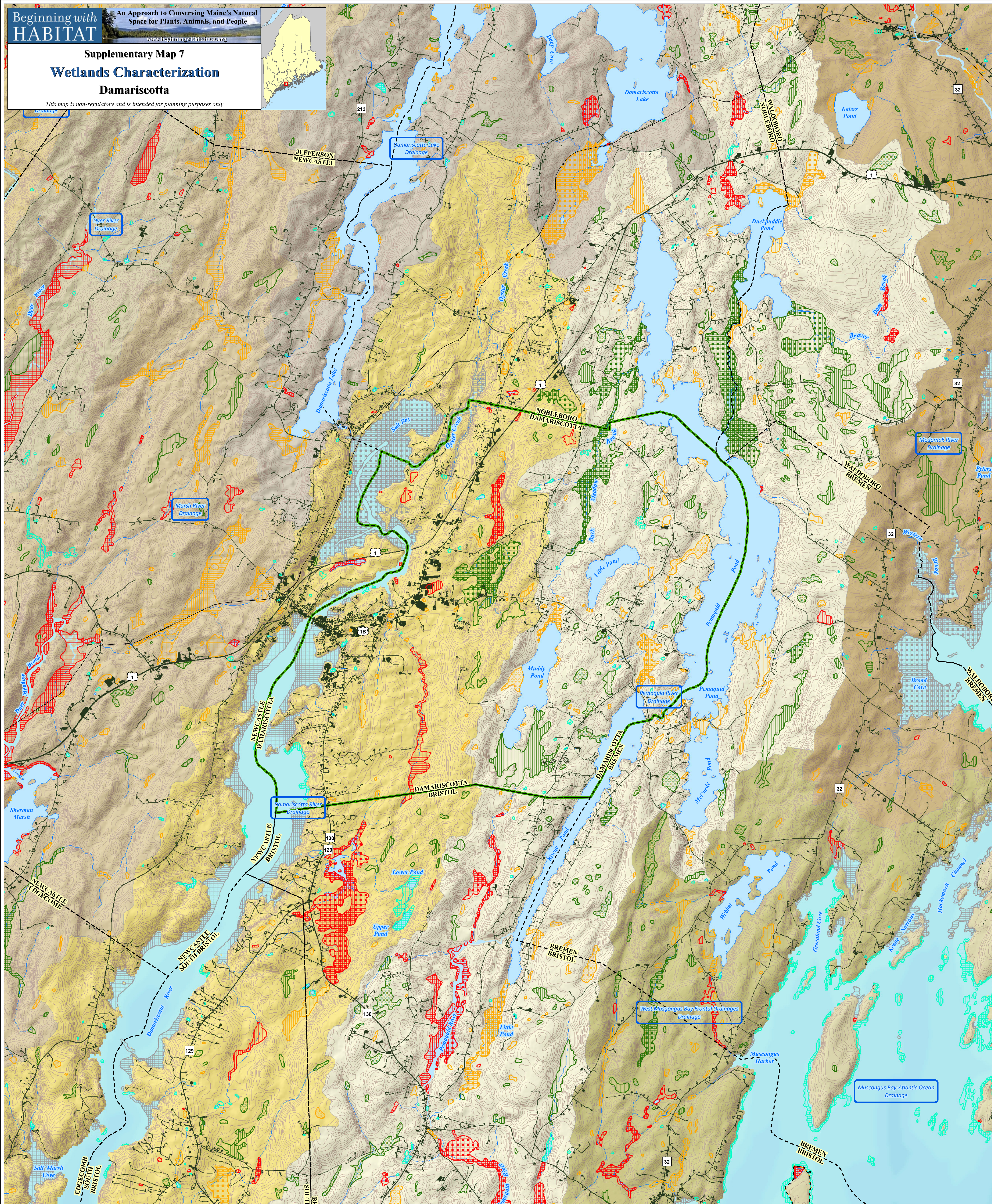
DATA SOURCE CONTACT INFORMATION
 Maine Office of GIS - <http://www.maine.gov/megis/catalog/>
 Maine Dept. of Agriculture, Conservation and Forestry - <http://www.maine.gov/dacf/>
 Maine Dept. of Inland Fisheries & Wildlife - <http://www.maine.gov/ifw/>
 Maine Department of Transportation - <http://www.maine.gov/mdot/>
 Maine Department of Environmental Protection - <http://www.maine.gov/dep/>

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Supplementary Map 7
Wetlands Characterization
Damariscotta

This map is non-regulatory and is intended for planning purposes only



LEGEND

This map depicts all wetlands shown on National Wetland Inventory (NWI) maps, but categorized them based on a subset of wetland functions. This map and its depiction of wetland features neither substitute nor eliminate the need to perform on-the-ground wetland delineation and functional assessment. In no way shall this map diminish or alter the regulatory protection that all wetlands are accorded under applicable State and Federal laws. For more information about wetlands characterization, contact Elizabeth Hertz at the Maine Department of Conservation (207-287-8061, elizabeth.hertz@maine.gov).

The Wetlands Characterization model is a planning tool intended to help identify likely wetland functions associated with significant wetland resources and adjacent uplands. Using GIS analysis, this map provides basic information regarding what ecological services various wetlands are likely to provide. These ecological services, each of which has associated economic benefits, include: floodflow control, sediment retention, finfish habitat, and/or shellfish habitat. There are other important wetland functions and values not depicted in this map. Refer to www.maine.gov/dep/water/wetlands/ipwefv2.html for additional information regarding wetland functions and values. Forested wetlands and small wetlands such as vernal pools are known to be underrepresented in the National Wetlands Inventory (NWI) data used to create this map. The model developed to estimate the functions provided by each wetland could not capture every wetland function or value. Therefore, it is important to use local knowledge and other data sources when evaluating wetlands, and each wetland should be considered relative to the whole landscape/watershed when assessing wetland resources at a local level.

- Organized Township Boundary
- Unorganized Township
- Selected Town or Area of Interest
- Developed: Impervious surfaces including buildings and roads

Subwatersheds - The shaded, background polygons are subwatersheds (areas that drain to a particular lake, wetland, pond, river, stream, or the ocean). The subwatersheds are shaded to show topographic relief. This "hillshading" assumes the sun is shining from the northwest, so ridges and north-facing slopes appear light, whereas valleys and southeast-facing slopes appear dark. Because many areas of Maine are relatively flat, the topographic relief shown here has been exaggerated to make the details easier to see.

Wetland Functions: Fill Pattern

- RUNOFF / FLOODFLOW ALTERATION**
Wetlands provide natural stormwater control capabilities. As natural basins in the landscape, wetlands are able to receive, detain, and slowly release stormwater runoff. Wetland shelves along stream banks naturally regulate flood waters by providing an area for swollen stream flows to expand and slow, thereby protecting downstream properties. This map assigns Runoff/Floodflow Alteration functions to wetlands that are contained in a known flood zone, (b) associated with a surfacewater course or waterbody, and (c) with slope < 3%.
- AND/OR EROSION CONTROL / SEDIMENT RETENTION**
Wetlands act as natural sponges that can hold water, allowing suspended particles such as sediment to settle out. The dense vegetation in most wetlands helps to stabilize soil and slow water flows, thereby reducing scouring and bank erosion. This map assigns Erosion Control / Sediment Retention functions to wetlands with (a) slope < 3%, (b) emergent vegetation; and (c) close proximity to a river, stream, or lake.
- FINFISH HABITAT**
Wetlands with documented finfish populations, including wetlands adjacent to a river, stream, or lake.
- AND/OR SHELLFISH HABITAT**
Inland wetlands and streams can directly affect the status of coastal shellfish harvest areas. Fecal coliform bacteria and waterborne nutrients resulting from land use changes away from the coast can travel via surface water to harvestable flats. One failed septic system near a stream could close a mudflat several miles away. Excessive nutrients can reduce water clarity and stimulate epiphytic growth that degrades eelgrass meadows. Conservation of freshwater wetlands and stream buffers in coastal watersheds is a key component in marine resource conservation. This map assigns a Shellfish Habitat function to wetlands within 0.5 miles of (a) identified shellfish habitat, (b) identified shellfish closure areas, or (c) mapped eelgrass beds OR palustrine wetlands directly connected by a stream of < 0.5 mile in length to (a) identified shellfish habitat, (b) identified shellfish closure areas, or (c) mapped eelgrass beds.
- PLANT/ANIMAL HABITAT**
Nearly all wildlife species, and many of Maine's plant species, depend on wetlands during some part of their life cycle. For the purposes of this map, wetlands containing open water or emergent vegetation, 3 or more wetland vegetation classes (see below), and within 1/4 mile of a known rare, threatened, or endangered plant or animal occurrence, within 1/4 mile of a mapped significant or essential habitat, or within 1/4 mile of a rare or exemplary natural community have been assigned this function. Rare element occurrences and mapped habitats can be found on Map 2 High Value Plant & Animal Habitats.
- OTHER FUNCTIONS**
CULTURAL/EDUCATIONAL Wetlands within 1/4 mile of a boat ramp or school have been assigned this value as these wetlands are likely candidates for use as outdoor classrooms, or similar social benefits. Wetlands rated for other functions listed above may also demonstrate cultural/educational values although not expressly shown.
OR
NO DOCUMENTED FUNCTION The basis of this characterization is high altitude aerial photos. Photo quality often limits the information that can be interpreted from small wetland features, or those with dense canopy cover. Although not assigned a function under this study, ground surveys may reveal that these wetlands have multiple functions and values.

Wetland Class: Fill Color

- Aquatic Bed (floating or submerged aquatic vegetation), Open Water
- Emergent (herbaceous vegetation), Emergent/Forested Mix (woody vegetation >20 ft tall), Emergent/Shrub-Scrub Mix (woody vegetation <20 ft tall)
- Forested, Forested/Shrub-scrub
- Shrub-scrub
- Other (rocky shore, streambed, unconsolidated shore, reef, rocky bottom)

National Wetlands Inventory (NWI) maps (the basis of wetlands shown on this map) are interpreted from high altitude photographs. NWI Wetlands are identified by vegetation, hydrology, and geography in accordance with "Classification of Wetlands and Deepwater Habitats" (FWS/OBS-79/31, Dec 1979). The aerial photographs document conditions for the year they were taken. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State, or local government. NWI maps depict general wetland locations, boundaries, and characteristics. They are not a substitute for on-ground, site-specific wetland delineation.

Data Sources

- DATA SOURCE INFORMATION**
(note: italicized file names can be downloaded from Maine Office of GIS)
- TOWNSHIP BOUNDARIES**
Maine Office of GIS (2015); *metwp24*
 - ROADS**
Maine Office of GIS, Maine Department of Transportation (2015); *medotpb*
 - HYDROLOGY**
Maine Office of GIS, U.S. Geological Survey (2010); *NHD*
 - DEVELOPED**
Maine Office of GIS, Maine Department of Inland Fisheries and Wildlife (2015)
 - NATIONAL WETLANDS INVENTORY (NWI)**
Maine Office of GIS (2015); *NWI*
 - DRAINAGE DIVIDES**
Maine Office of GIS (2015); *medrdd*
- DATA SOURCE CONTACT INFORMATION**
Maine Office of GIS: <http://www.maine.gov/megis/>
Maine Department of Transportation: <http://www.maine.gov/mdot/>
Maine Department of Agriculture, Conservation and Forestry: <http://www.maine.gov/dacf/planning/index.html>
Maine Geological Survey: <http://www.maine.gov/doc/nr/mc/mgs/mgs.htm>
- DIGITAL DATA REQUEST**
To request digital data for a town or organization, visit our website.
http://www.beginningwithhabitat.org/the_maps/gis_data_request.html

This map is non-regulatory and is intended for planning purposes only



LEGEND

For more information about U.S. Fish & Wildlife Service Priority Trust Species, contact Bob Houston at the U.S. Fish & Wildlife Service Gulf of Maine Coastal Program (207-781-8364, robert_houston@fws.gov).

Introduction

This map identifies potentially valuable habitat for U.S. Fish and Wildlife Service (USFWS) Priority Trust Species based on the Gulf of Maine Watershed Habitat Analysis developed by the USFWS Gulf of Maine Coastal Program. This analysis was completed for the United States portion of the Gulf of Maine watershed that includes all of Maine, most of New Hampshire, and the eastern third of Massachusetts.

Habitat Types and Importance

- Township Boundary
- Unorganized Township Boundary
- Selected Town or Area of Interest
- Developed- Residential, Industrial, Commercial, and Roads

Habitats

- | | |
|------------------------------------|--|
| Saltmarsh/saltwater | Freshwater wetlands (non-forested wetlands) |
| 1 - 49% | 1 - 49% |
| 50 - 74% | 50 - 74% |
| Top 25% (most important) | Top 25% (most important) |
| Grassland/shrub/bare ground | Forested (includes forested wetland) |
| 1 - 49% | 1 - 49% |
| 50 - 74% | 50 - 74% |
| Top 25% (most important) | Top 25% (most important) |

Priority Trust Species

The 91 USFWS Gulf of Maine Priority Trust Species include animals and plants that regularly occur in the Gulf of Maine watershed and meet any of the following criteria:
 + Federally endangered, threatened, or candidate species;
 + Migratory birds, sea-run fish and marine fish that show significant and persistent declining population trends, or have been identified as endangered or threatened by 2 or 3 states in the Gulf of Maine watershed;
 + Species of concern as identified in the U.S. Shorebird Conservation Plan, Colonial Waterbird Plan or Partners in Flight.

An asterisk (*) following the name in the list of priority species below indicates that high value habitat depicted on the map at left has the potential to support that species.

- | | | |
|------------------------------|-----------------------------|---------------------------|
| BIRDS | BIRDS (cont'd) | BIRDS (cont'd) |
| American bittern* | Marsh wren* | Upland sandpiper |
| American black duck* | Nelson's sparrow | Veery* |
| American oystercatcher | Northern flicker* | Whimbrel |
| American woodcock* | Northern goshawk | Whip-poor-will |
| Arctic tern | Northern harrier | White-winged scoter |
| Bald eagle* | Olive-sided flycatcher | Wilson's Snipe* |
| Baldpate oriole* | Osprey* | Wood duck* |
| Bay-breasted warbler | Peregrine falcon | Wood thrush* |
| Bicknell's thrush | Pied-billed grebe* | Yellow rail |
| Black scoter | Piping plover | |
| Black tern | Prairie warbler | FISHERIES |
| Black-bellied plover* | Purple sandpiper | Alewife* |
| Blackburnian warbler | Razorbill | American eel* |
| Blackpoll warbler | Red crossbill | American shad* |
| Black-throated blue warbler* | Red-headed woodpecker | Atlantic salmon* |
| Blue-winged warbler | Red knot | Atlantic sturgeon* |
| Buff-breasted sandpiper | Red-shouldered hawk | Blueback herring* |
| Canada warbler* | Roseate tern | Bluefish |
| Cape May warbler | Ruddy turnstone | Horseshoe crab |
| Chestnut-sided warbler* | Saltmarsh sparrow | Shortnose sturgeon* |
| Common loon* | Sanderling | Winter flounder |
| Common tern | Scaup (greater and lesser)* | |
| Eastern meadowlark | Seaside sparrow | PLANTS |
| Field sparrow | Sedge wren | E. prairie fringed orchid |
| Golden-winged warbler | Semipalmated sandpiper | Furbish's lousewort |
| Grasshopper sparrow | Short-billed dowitcher* | Robbins' cinquefoil |
| Hudsonian godwit | Short-eared owl | Small whorled pogonia |
| Killdeer* | Snowy egret | |
| Least sandpiper* | Solitary sandpiper* | MAMMAL |
| Least tern | Spruce grouse | Canada lynx |
| Little blue heron | Surf scoter* | |
| Little gull | Tricolored heron | REPTILE |
| Louisiana waterthrush | | Plymouth redbelly turtle |

Mapping Valuable Habitat

Using a Geographic Information System (GIS), valuable habitat was mapped by combining field sightings (collected by various agencies and non-governmental organizations) and habitat modeling. Frequently, sightings are too limited to adequately represent all habitat used. Therefore, habitat models based on selected environmental conditions can be helpful in more fully predicting potential habitat utilization.

To create the final map shown on this page, we first identified habitat for each of the 91 species in the analysis and ranked its importance on a scale of one to ten, with ten being considered the most important. Next, we combined the scores for each of the species to create a sum of scores. Then, we subdivided the sum of scores into the four basic habitat types shown on this map. Finally, we portrayed the data in a three level gradient (the top 25%, the next 25%, and then, the bottom 50% of the habitat value for each habitat type). The top 25% may be considered the most important habitat in that gradient.

Uses of the Data

This map may be used in combination with other data sources to help identify potentially valuable wildlife habitat at the local or town level. This information can be incorporated into town comprehensive planning or open space planning. It may also be used to help prioritize habitat protection by local land protection organizations or to support grants for habitat protection. This map represents only one possible way of portraying the model results; there are many other maps that may be derived from the data. Please contact the Gulf of Maine Coastal Program for more information and assistance.

Limitations of the Data

Maps of habitats for individual species are limited by the accuracy and timeliness of the data sets used in developing them and by the validity of models used to interpret those data. We used the most recent data available and relied on species experts to review the models. We also tested predicted habitats using occurrence data. Habitat maps rely quite extensively on land cover and the land cover used for this project is based on the interpretation of 1993 satellite imagery with a resolution of 30 meters (each pixel on the map is about 1/4 acre). It is important to realize that if land cover has changed significantly since 1993 in a given area, the predicted habitat value for individual species may no longer be reliable. We must also emphasize that this map only depicts predicted high value habitat for the species included in the analysis; important habitat may exist for other species not included in this analysis. Other important USFWS habitat of significance includes Nationally Significant Maine Coastal Nesting Islands, areas around National Wildlife Refuges, and specific endangered species habitat. There also may be important habitat information available from state conservation agencies or other environmental organizations. In addition, this map does not show buffer zones that should be included to protect valuable wildlife habitat.

For More Information

The Gulf of Maine Coastal Program can provide more information that will help support your habitat protection initiatives. This includes detailed parcel-specific maps, detailed tables delineating habitat importance for each of the 91 species and assistance in grant-writing for some habitat protection grants. For more information please contact us or see our website <http://www.fws.gov/northeast/gulfmaine>.

Data Sources

- DATA SOURCE INFORMATION**
 (note: italicized file names can be downloaded from Maine Office of GIS)
TOWNSHIP BOUNDARIES
 Maine Office of GIS (2006); metwp24
ROADS
 Maine Office of GIS, Maine Department of Transportation (2005); medotpub
HYDROLOGY
 Maine Office of GIS, U.S. Geological Survey (2004); hyd24
HIGH VALUE HABITAT FOR PRIORITY TRUST SPECIES
 U.S. Fish & Wildlife Service-Gulf of Maine Coastal Program; fores91, fresh91, grass91, saline91, gomic7
DATA SOURCE CONTACT INFORMATION
 Maine Office of GIS: <http://www.maine.gov/megis/>
 U.S. Fish & Wildlife Service: Gulf of Maine Coastal Program: <http://www.fws.gov/GOMCP>
 Maine Department of Transportation: <http://www.maine.gov/mdot/>
 Maine Geological Survey: <http://www.maine.gov/doc/nrimc/mgs/mgs.htm>

DIGITAL DATA REQUEST

To request digital data for a town or organization, or to request a CD containing GIS data of the Gulf of Maine Watershed Habitat Analysis, visit our website. http://www.beginningwithhabitat.org/the_maps/gis_data_request.html

E. Strategies

Minimum strategies to meet state goals:

- (1) Adopt or amend local land use ordinances as applicable to incorporate stormwater runoff performance standards consistent with:
 - a. Maine Stormwater Management Law and Maine Stormwater regulations (Title 38 M.R.S.A. §420-D and 06-096 CMR 500 and 502).
 - b. Maine Department of Environmental Protection's allocations for allowable levels of phosphorus in lake/pond watersheds.
 - c. Maine Pollution Discharge Elimination System Stormwater Program
- (2) Consider amending local land use ordinances, as applicable, to incorporate low impact development standards.
- (3) Where applicable, develop an urban impaired stream watershed management or mitigation plan that will promote continued development or redevelopment without further stream degradation.
- (4) Maintain, enact or amend public wellhead and aquifer recharge area protection mechanisms, as necessary.
- (5) Encourage landowners to protect water quality. Provide local contact information at the municipal office for water quality best management practices from resources such as the Natural Resource Conservation Service, University of Maine Cooperative Extension, Soil and Water Conservation District, Maine Forest Service, and/or Small Woodlot Association of Maine.
- (6) Adopt water quality protection practices and standards for construction and maintenance of public and private roads and public properties and require their implementation by contractors, owners, and community officials and employees.
- (7) Participate in local and regional efforts to monitor, protect and, where warranted, improve water quality.
- (8) Provide educational materials at appropriate locations regarding aquatic invasive species.

3. Natural Resources

A. State Goal

To protect the State's other critical natural resources, including without limitation, wetlands, wildlife and fisheries habitat, sand dunes, shorelands, scenic vistas, and unique natural areas.

B. Analyses

To generate minimum analyses to address state goals, use Conditions and Trends data in Section 3.3(C) to answer the following questions.

- (1) Are any of the community's critical natural resources threatened by development, overuse, or other activities?
- (2) Are local shoreland zone standards consistent with state guidelines and with the standards placed on adjacent shorelands in neighboring communities?
- (3) What regulatory and non-regulatory measures has the community taken or can the community take to protect critical natural resources and important natural resources?
- (4) Is there current regional cooperation or planning underway to protect shared critical natural resources? Are there opportunities to partner with local or regional groups?

C. Conditions and Trends

Minimum data required to address Analyses:

- (1) The community's Comprehensive Planning Natural Resources Data Set prepared and provided to the community by the Department of Inland Fisheries and Wildlife, Department of Environmental Protection and the Office, or their designees.
- (2) A map or description of scenic areas and scenic views of local importance, and regional or statewide importance, if available.

D. Policies

Minimum policies required to address state goals:

- (1) To conserve critical natural resources in the community.
- (2) To coordinate with neighboring communities and regional and state resource agencies to protect shared critical natural resources.

E. Strategies

Minimum strategies required to address state goals:

- (1) Ensure that land use ordinances are consistent with applicable state law regarding critical natural resources.
- (2) Designate critical natural resources as Critical Resource Areas in the Future Land Use Plan.

- (3) Through local land use ordinances, require subdivision or non-residential property developers to look for and identify critical natural resources that may be on site and to take appropriate measures to protect those resources, including but not limited to, modification of the proposed site design, construction timing, and/or extent of excavation.
- (4) Through local land use ordinances, require the planning board (or other designated review authority) to include as part of the review process, consideration of pertinent BwH maps and information regarding critical natural resources.
- (5) Initiate and/or participate in interlocal and/or regional planning, management, and/or regulatory efforts around shared critical and important natural resources.
- (6) Pursue public/private partnerships to protect critical and important natural resources such as through purchase of land or easements from willing sellers.
- (7) Distribute or make available information to those living in or near critical or important natural resources about current use tax programs and applicable local, state, or federal regulations.

4. Agricultural and Forest Resources

A. State Goal

To safeguard the State's agricultural and forest resources from development which threatens those resources.

B. Analyses

To generate minimum analyses to address state goals, use Conditions and Trends data in Section 3.4(C) to answer the following questions.

- (1) How important is agriculture and/or forestry and are these activities growing, stable, or declining?
- (2) Is the community currently taking regulatory and/or non-regulatory steps to protect productive farming and forestry lands? Are there local or regional land trusts actively working to protect farms or forest lands in the community?
- (3) Are farm and forest land owners taking advantage of the state's current use tax laws?
- (4) Has proximity of new homes or other incompatible uses affected the normal farming and logging operations?
- (5) Are there large tracts of agricultural or industrial forest land that have been or may be sold for development in the foreseeable future? If so, what impact would this have on the community?

Water Resources

Overview

Damariscotta is located just twelve miles from the ocean at the head of the Pemaquid Peninsula. It is situated at the lower falls and head of navigation on the eastern side of the Damariscotta River. Between the northern portions of Newcastle and Damariscotta is Great Salt Bay, the state's first marine protected area. Damariscotta Lake and Nobleboro lie further north, with Bristol and Pemaquid to the south. In the eastern part of town, Biscay and Pemaquid Ponds form a natural boundary with neighboring Bremen. Wholly within the boundary of Damariscotta are Little Pond and Paradise (or Muddy) Pond.

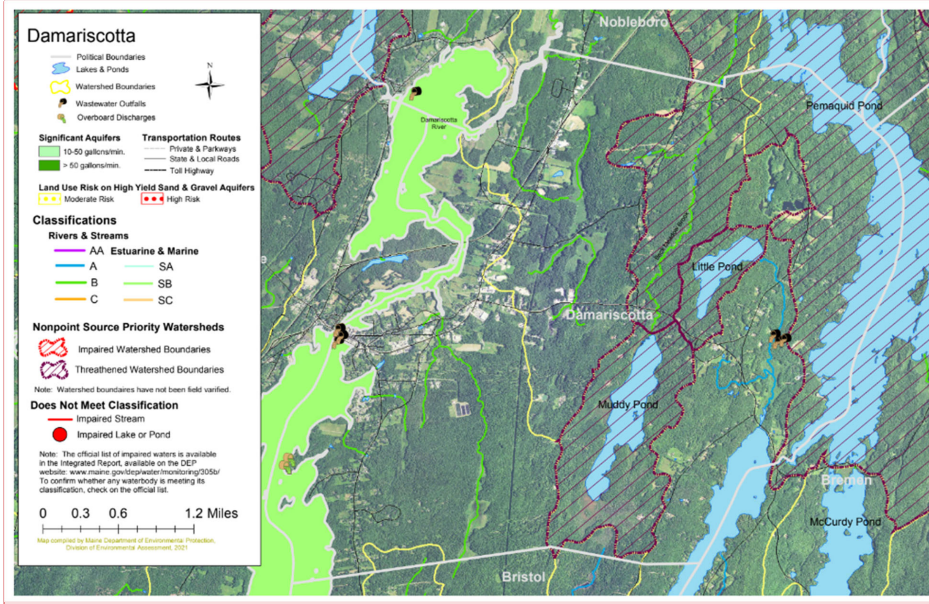
The Little Pond watershed acts as the primary source of drinking water for the Town of Damariscotta, managed by the Great Salt Bay Sanitary District. The Sanitary District disinfects the water taken from Little Pond, but has received a waiver from filtration requirements due to the pond's high water quality, leaving it otherwise untreated. In order to receive the waiver, the District demonstrated that water from Little Pond has low turbidity and coliform counts, and that potential sources of contamination are managed to minimize risk. The Town and District work together to establish policy and management practices to prevent contamination of Little Pond from direct and non-point pollution sources to maintain current drinking water quality.

The Town minimizes contamination of watersheds by zoning all land around the area for low-density residential and rural use only. Damariscotta's Shoreland Zoning Ordinance regulates new construction and commercial use of land surrounding all bodies of water in town, in accordance with the State's Chapter 1000 standards, and the Town's Site Plan Review Ordinance requires the Planning Board to evaluate plans to minimize erosion of soil and includes standards for stormwater management on all sites within the community where new development is proposed. Developers are required to evaluate the impact of phosphorus runoff by any proposed operation in cases where this would be a concern. The Town collaborates with the Great Salt Bay Sanitary District to ensure the quality of its water bodies, particularly Little Pond.

Major Bodies of Water

Water is a character defining feature of the Town of Damariscotta. The Damariscotta River bisects the downtowns of Damariscotta and neighboring Newcastle. Running from the river is Oyster Creek, which contains shellfish habitats and a saltmarsh classified as an "exemplary natural community" by the Maine Department of Inland Fisheries and Wildlife (IF&W). All four ponds located within Damariscotta support aquatic life, and brook trout stocks in Little Pond

are replenished by the IF&W. Muddy Pond is home to wetland habitats, as is its main tributary Back Meadow Brook. There are no significant underground aquifers within the Town.¹



Source: Maine Department of Environmental Protection (2021)

Commented [1]: Maps will be formatted to be more visible in final plan

Inventory

Ponds ²	Ecological ³ Value	Water Body Classification	Watershed threatened or impaired	Threats to water quality	Documented threats or invasive species
Little Pond	Coldwater fishery Pemaquid river watershed	Class GPA	Yes	Sediment runoff Contamination from fish stock	No

¹ Thompson, Woodrow B., "Surficial geology of the Damariscotta quadrangle, Maine, Maine Geological Survey, Open-File Map 09-6, map, scale 1:24,000, (Maine Geological Survey Maps, 2009), http://digitalmaine.com/mgs_maps/1838

² Thompson, Woodrow B., "Surficial geology of the Damariscotta quadrangle, Maine, Maine Geological Survey, Open-File Map 09-6, map, scale 1:24,000, (Maine Geological Survey Maps, 2009), http://digitalmaine.com/mgs_maps/1838

³ "Your Lake - Search Results, Damariscotta, Maine," Lakes of Maine (Lake Stewards of Maine, 2023), <http://www.lakesofmaine.org/search-results.html?DoWhat=&=&t=damariscotta&c=&z=&m=>.

	Department of Fisheries and Wildlife Brook Trout replenishment site			replenishment Wastewater discharge in adjacent water body	
Paradise (Muddy) Pond	Warm Water fishery Pemaquid River watershed Wetland habitats present 250 foot riparian buffer	Class GPA	Yes	Sediment runoff Development	No
Pemaquid Pond	Coldwater fishery Warm Water fishery Pemaquid River watershed Wetland habitats present	Class GPA	Yes	Wastewater discharge in adjacent water body Nearby septic contamination Sediment runoff	No
Biscay Pond	Coldwater fishery Warm Water fishery	Class GPA	No	Wastewater discharge in adjacent water body	No

	Pemaquid river watershed			Sediment runoff	
Rivers and Streams					
Damariscotta River	Shellfish growing area Wetland habitats present 250 riparian buffer zone	Class B	No	Sediment runoff Development Direct wastewater discharge site	No
Oyster Creek	Wetland habitats present Mixed saltmarsh habitats present (listed as an "exemplary natural community" by BWH map) Damariscotta River watershed 250 foot riparian buffer zone	Class B	No	Sediment runoff Wastewater discharge in adjacent water body	No
Back Meadow Brook	Wetland habitats present	Class B	Yes	Sediment runoff Nearby septic	No

	75 foot riparian buffer zone			contamination	
Stream connecting Little and Biscay Pond	75 foot riparian buffer zone Wetland habitats present	Class A	No	Sediment runoff Direct Wastewater discharge	No
Salt Bay	Wetland habitats present Oyster growing area	Class SB ⁴	No	Sediment runoff Wastewater discharge (out of town boundary)	No

Commented [2]: See comment below - does this have a name?

Water body classification should be viewed as a hierarchy of risk, more than one of use or quality, the risk being the possibility of a breakdown of the ecosystem and loss of use due to either natural or human-caused events. Ecosystems that are more natural in their structure and function can be expected to be more resilient to a new stress and to show more rapid recovery. Classes AA, GPA and SA involve little risk since activities such as waste discharge and impoundment are prohibited. The expectation to achieve natural conditions is high and degradation is unlikely. Class A waters allow impoundments and very restricted discharges, so the risk of degradation, while quite small, does increase since there is some small human intervention in the maintenance of the ecosystem. Classes B and SB have fewer restrictions on activities but still maintain high water quality criteria. Finally, Classes C and SC have the least restrictions on use and the lowest (but not low) water quality criteria. Classes C and SC waters are still of good quality, but the margin for error before significant degradation might occur in these waters in the event of an additional stress being introduced (such as a spill or a drought) is the least.⁵

Threats to Water Quality

⁴ "Your Lake - Search Results, Damariscotta, Maine," Lakes of Maine (Lake Stewards of Maine, 2023), <http://www.lakesofmaine.org/search-results.html?DoWhat=&=&=damariscotta&c=&z=&m=>

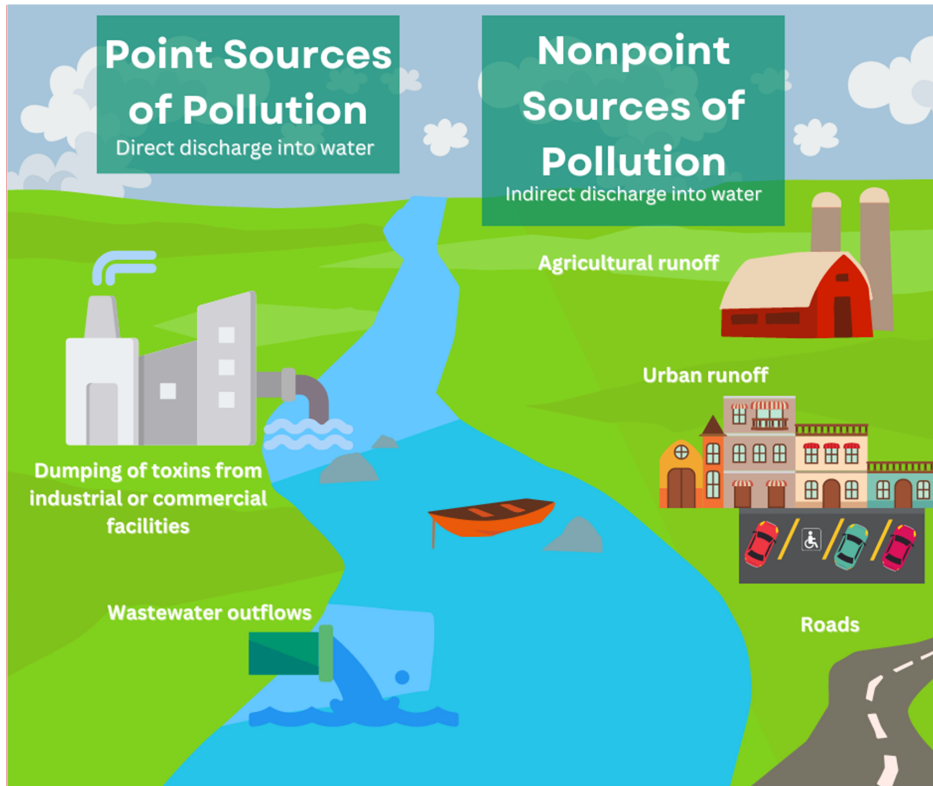
⁵ "Classification of Maine Waters," Maine DEP Water Monitoring and Reporting (Maine Department of Environmental Protection, 2019), [https://www.maine.gov/dep/water/monitoring/classification/#:~:text=The%20State%20has%20four%20classes.lakes%20and%20ponds%20\(GPA\).](https://www.maine.gov/dep/water/monitoring/classification/#:~:text=The%20State%20has%20four%20classes.lakes%20and%20ponds%20(GPA).)

There are no reported cases of invasive plant or aquatic species in Damariscotta's water bodies,⁶ and the majority of Damariscotta's rivers and streams are classified at B or higher quality. The major threats to water quality come from nonpoint sources of pollution, mainly phosphorus from sediment runoff and increased risk of soil erosion due to development. The prevalence of per-and polyfluoroalkyl substances (PFAS) in existing agricultural land and waterways is still being evaluated across the state, but could pose a threat to Damariscotta's bodies of water. The State of Maine's decision to ban the use of treated sewage sludge as a fertilizer source last year⁷ implies any farmland in Damariscotta could potentially have been a nonpoint source of PFAS to nearby waterways. Because the Town deposits treated wastewater directly into the Damariscotta River, the local shellfish habitats and wetland ecosystems may also be contaminated by PFAS.

Commented [3]: I'll look for guidance from the Committee on this section (if you want to keep it in here or remove it) - this hasn't been proven or found to be a concern in Damariscotta as yet, but clearly is a concern across the state

⁶Amy Dowley, *Beginning With Habitat*, ed. Steve Walker, *Beginning With Habitat* (Maine Department of Inland Fisheries and Wildlife, 2023), <https://webapps2.cgis-solutions.com/beginningwithhabitat/mapviewer/>

⁷Tom Perkins, "Maine Bans Use of Sewage Sludge on Farms to Reduce Risk of PFAS Poisoning," *The Guardian* (Guardian News and Media, May 12, 2022), <https://www.theguardian.com/environment/2022/may/12/maine-bans-sewage-sludge-fertilizer-farms-pfas-poisoning>.



Commented [4]: I made this graphic so we can edit it if desired

Threats from invasive species, nonpoint pollution, and erosion may also become more severe in the future due to climate change. Of particular concern are a series of gravel pits north of Little Pond. The Great Salt Bay Sanitary District manages a series of dams to impede runoff into the watershed, but in the most recent Source Water Assessment Program (SWAP) report, GSBSD staff mentioned concerns in the dams' capacity to impede stormwater runoff.⁸ As average precipitation (and the intensity of precipitation events) continue to increase as a result of climate change, the threat of sediment flowing into Little Pond and increasing turbidity may pose a serious future risk to water quality.

⁸ Maine Center for Disease Control and Prevention: Maine Source Water Assessment Program information, <https://www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws/swp.shtml#:~:text=The%20Source%20Water%20Assessment%20Program,better%20protect%20their%20water%20sources.>

Point Sources (Direct Discharges) of Pollution

There are multiple wastewater outfalls in Downtown Damariscotta, and overboard discharges on Hall Point, all of which release wastewater into the Damariscotta River.⁹ Wastewater from the public sewer provider, the Great Salt Bay Sanitary District, is discharged into the Damariscotta River near the municipal parking lot. Additionally, multiple wastewater discharge sites east of downtown Damariscotta empty into an unnamed stream connecting Biscay Pond to Little Pond, which is the Town's primary source of drinking water.

Commented [5]: Question for CPC: is there a colloquial name for this stream? (see map above)

The Sanitary District treats wastewater in an aerated lagoon system before discharging. However, like in many rivers across Maine, fecal coliform is still present in the Damariscotta River, which could restrict in the future any harvesting of the shellfish habitats in Salt Bay or the area of the river around Downtown Damariscotta. The Maine Department of Marine Resources uses fecal coliforms to most accurately assign classifications based on quantities of bacteria originating from the digestive tracts of warm-blooded animals that are potentially pathogenic and therefore reflect a human health risk. Classes SA and SB state that "waters must be of such quality that they are suitable for...harvesting of shellfish", while Class SC waters must be "suitable for...restricted harvesting of shellfish." The Damariscotta River is currently rated Class SB.¹⁰ Please refer to the Marine Resources section of this Plan for further information on the impacts of pollution to the town's working waterfront.

Nonpoint Sources of Pollution

The watersheds around Little, Paradise, and Pemaquid Pond, as well as Back Meadow Brook, are all considered impaired due to pollution. These are most likely from sediment runoff and erosion due to development around the watershed areas. Lakes and ponds normally experience an aging process known as eutrophication, which is caused by various natural and man-made influences. Phosphorus from runoff, fertilizers, and sewage is a primary factor affecting eutrophication, a process in which waters become so nutrient-rich, algae and plant species bloom to the point that they kill off aquatic species and impact water quality.

In the 1970s, Little Pond experienced several algae blooms and was classified as eutrophic, the highest category of algae productivity. While eutrophic activity is still high, water quality data from the 1980s and 1990s show significant improvement due in part to several copper sulfate treatments, increased ownership by the Sanitary District of the land surrounding Little Pond, and decreased activity in the watershed. Water quality has improved sufficiently since the 1990s and continues to be high enough to support a filtration waiver. Water supplied by the

⁹ Map of Damariscotta Watersheds, Maine Department of Environmental Protection (2021).

¹⁰ Susanne K Meidel, "2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report Appendices, https://www.maine.gov/dep/water/monitoring/305b/2022/25-May-2022_2018-22_ME_IntegratedRpt-LIST.pdf.

Sanitary District is disinfected but otherwise untreated. In order to receive the waiver, the Sanitary District has demonstrated that water from Little Pond has low turbidity and coliform counts and is generally of high quality.¹¹

Little Pond's historic contamination was caused by significant runoff from a gravel mining operation northeast of its watershed, which increased the turbidity of the drinking water and contributed to its high eutrophic classification. The gravel mining operation has ceased, and the Great Salt Bay Sanitary District now owns the remaining pits, and has been managing runoff through a series of dams meant to impede sediment runoff and revegetation efforts to ensure permanent soil retention of the former work site.

A report from the Maine Center for Disease Control and Prevention's Source Water Assessment Program (SWAP) cites concerns from Sanitary District staff regarding the integrity of the dams, and the substantial influx of turbid water that could contaminate the pond if the dams failed to prevent the runoff. The dams were not built to account for the increased severity and frequency of precipitation events due to climate change, meaning the risk of a substantial release of contaminated water may be more severe than previously accounted for.

Drinking Water

Due to the Town's existing land use controls and the management practices of the Great Salt Bay Sanitary District, threats from contamination of the Town's drinking water are considered low. Conservation and management of Little Pond is done primarily by the Great Salt Bay Sanitary District, a quasi-municipal entity which serves approximately 700 residential and commercial customers in Damariscotta. More than 95% of the 424 acre watershed is currently undeveloped. The Great Salt Bay Sanitary District owns all but 1,000 acres of the shoreline, and development within the watershed has been limited due to District management and Town regulations intended to prevent shoreline erosion or any new sources of pollution.¹² Other than the water intake station, the only structures near Little Pond are low-density rural developments built around the periphery of the watershed.

According to data included in the most recent Source Water Assessment Program Report for Great Salt Bay Sanitary District: Little Pond Watershed, soil along the shoreline of Little Pond has low to moderate erodibility and the Sanitary District has not observed areas of significant erosion along the shoreline. There are no known commercial facilities in the watershed that use

¹¹ Maine Public Drinking Water Source Water Assessment Program Report for Great Salt Bay Sanitary District: Little Pond Watershed (March 2003).

¹² Maine Public Drinking Water Source Water Assessment Program Report for Great Salt Bay Sanitary District: Little Pond Watershed (March 2003).

petroleum or other materials that could pose a threat to the water quality of the pond. Commercial land uses within the watershed are limited to periodic timber harvesting, all of which is managed by a forest manager to ensure safe harvesting practices that do not pose a threat to drinking water.

Access to Little Pond is limited to a gravel drive to the water intake station (which the District keeps locked) and a foot trail from Biscay Road at the south end of the pond to facilitate limited recreational canoeing and fishing. Fishing is permitted only in the summer months, and use of live bait or motorized water vehicles is prohibited. Fish stocks are replenished by the Maine Department of Inland Fisheries & Wildlife (IF&W), which poses a minor threat of contamination to water sources as it occurs in close proximity to the pond’s only water intake station. The District has developed a specific protocol with IF&W to minimize the contamination risk of fish stock replenishment. Based on these factors, the overall threats to quality of the Little Pond water supply is considered to be low.

Contamination Threats to Private Drinking Water Sources

Several private bedrock wells are present within Damariscotta.¹³ Information obtained from the Maine Department of Environmental Protection found no current contamination, but found varying levels of risk of current and future contamination for each well. The major sources posing a risk to future contamination came from the wells’ close proximity to private septic systems and a lack of ownership of the land surrounding the well. The findings were unable to determine significant risks of chronic contamination due to a lack of data on the distance of wells from potential chemical contaminants.

Well owner	Risk of geologic contamination	Risk of acute contamination	Risk of chronic contamination
Pines Mobile Home Park	Low	Moderate Future: Moderate	Low Future: High
Miles Health Water System	Moderate	Low High	Moderate High
Lake Pemaquid Campground	Low	Moderate Moderate	N/A
Reunion Station Restaurant	Low	Moderate Low	N/A

¹³ PWS Data provided by the Maine Department of Environmental Protection, Fall 2021.

In the list above, risk assessment of private well contamination is organized by contamination type. Risk of geologic contamination is based on the type of well and thickness of well walls. Risk of acute contamination is based on proximity of septic and waste systems. Risk of future acute contamination is based on the radius of land around the well owned by the well owner. Risk of chronic contamination is based on the presence of potential sources of chemical contaminants. Risk of future chronic contamination is based on ownership or control of the entire wellhead protection area.

Protective Measures: Local Ordinances

Town policy intended to prevent degradation of Damariscotta’s water resources includes the Town’s Site Plan Review Ordinance, which requires an erosion and sediment control plan to mitigate the risk of erosion and sediment contamination during construction, a stormwater management plan, and a report on the phosphorus impact of any new construction or alteration (if located within the watershed of a great pond, as defined in Title 38 M.R.S.A. §436-A). This type of careful planning is meant to minimize the risk of contamination as much as possible to nearby water sources.

The Town has also implemented a Shoreland Zoning Ordinance, which establishes land within 75 feet of a normal high water line of a stream as a Stream Protection District, land within 250 feet of coastal or freshwater wetlands as a Resource Protection District.¹⁴ This Ordinance regulates all new construction or alterations within this buffer zone, and expressly prohibits any new construction within 25 feet of a water body or wetland. It also regulates the maximum size for new structures based on their distance from the water body boundary, and requires pre-existing structures to obtain a permit for any new alterations. Any new construction must partially re-establish trees and local vegetation removed in order to build a new structure, and ensure the retention of natural stormwater buffers in the area whenever possible.

The Shoreland Zoning Ordinance also limits commercial use to prevent contamination from fertilizers, petrol products, chemical, heavy metals, or other industrial pollutants. Any agriculture, mineral extraction, or natural resource harvesting near a body of water is heavily regulated, and any operation (whether natural resource gathering or construction) must provide an erosion and sedimentation control plan to ensure minimal threat of runoff.

Overarching Policies

State Goal

¹⁴ See the Town’s adopted Shoreland Zoning Ordinance.

1. Protect the quality and manage the quantity of the community's water resources, including lakes, aquifers, great ponds, estuaries, rivers and the like.

State Policies

1. To protect current and potential drinking water sources.
2. To protect significant water resources from pollution and improve water quality where needed.
3. To protect water resources in growth areas while promoting more intensive development in those areas.
4. To minimize pollution discharges through the update of existing public sewer systems and wastewater treatment facilities.
5. To cooperate with neighboring communities and regional/local advocacy groups to protect water resources.

Suggested potential policy recommendations:

- Collaborate with the Sanitary District to ensure strong watershed protection through zoning and enforcement support from town officials. Poor water quality in the past shows Little Pond is highly susceptible to contamination and point to changes in land use policy as the source of recovery of water quality to current levels.
- The Town should work closely with the District to prevent soil erosion or phosphate accumulation in the pond from the gravel pits north of the pond, and ensure they are re-vegetated as quickly as possible
- The Town should work closely with the District to evaluate the integrity of the impoundment dams and repair these as necessary, to prevent the inadvertent release of water.
- Further information signage on the access trail from Biscay Road may be helpful in notifying the public that Little Pond is a source of drinking water, and outlining what recreational activities are permitted.
- Collaborate with the Maine DEP and local conservation organizations to understand the impact projected increases in annual precipitation will have on stormwater runoff to help minimize future contamination of waterways
- Work with Coastal Rivers Conservation Trust to monitor invasive species migration in the region to ensure native ecosystems are safe from this potential stressor.

Commented [6]: This is just a placeholder for now, including my own notes and suggestions. We will discuss goals, policies and strategies after the final community survey results are in

E. Strategies

Minimum strategies required to address state goals:

- (1) For known historic archeological sites and areas sensitive to prehistoric archeology, through local land use ordinances require subdivision or non-residential developers to take appropriate measures to protect those resources, including but not limited to, modification of the proposed site design, construction timing, and/or extent of excavation.
- (2) Adopt or amend land use ordinances to require the planning board (or other designated review authority) to incorporate maps and information provided by the Maine Historic Preservation Commission into their review process.
- (3) Work with the local or county historical society and/or the Maine Historic Preservation Commission to assess the need for, and if necessary plan for, a comprehensive community survey of the community's historic and archaeological resources.

2. Water Resources

A. State Goal

To protect the quality and manage the quantity of the State's water resources, including lakes, aquifers, great ponds, estuaries, rivers, and coastal areas.

B. Analyses

To generate minimum analyses to address state goals, use Conditions and Trends data in Section 3.2(C) to answer the following questions.

- (1) Are there point sources (direct discharges) of pollution in the community? If so, is the community taking steps to eliminate them?
- (2) Are there non-point sources of pollution? If so, is the community taking steps to eliminate them?
- (3) How are groundwater and surface water supplies and their recharge areas protected?
- (4) Do public works crews and contractors use best management practices to protect water resources in their daily operations (e.g. salt/sand pile maintenance, culvert replacement street sweeping, public works garage operations)?
- (5) Are there opportunities to partner with local or regional advocacy groups that promote water resource protection?

C. Conditions and Trends

Minimum data required to address Analyses:

- (1) The community's Comprehensive Planning Water Resources Data Set prepared and provided to the community by the Department of Inland Fisheries and Wildlife, the Department of Environmental Protection and the Office, or their designees.
- (2) A description of each great pond, river, surface drinking water supply, and other water bodies of local interest including:
 - a. ecological value;
 - b. threats to water quality or quantity;
 - c. documented water quality and/or invasive species problems.
- (3) A summary of past and present activities to monitor, assess, and/or improve water quality, mitigate sources of pollution, and control or prevent the spread of invasive species.
- (4) A description of the location and nature of significant threats to aquifer drinking water supplies.
- (5) A summary of existing lake, pond, river, stream, and drinking water protection and preservation measures, including local ordinances.

D. Policies

Minimum policies required to address state goals:

- (1) To protect current and potential drinking water sources.
- (2) To protect significant surface water resources from pollution and improve water quality where needed.
- (3) To protect water resources in growth areas while promoting more intensive development in those areas.
- (4) To minimize pollution discharges through the upgrade of existing public sewer systems and wastewater treatment facilities.
- (5) To cooperate with neighboring communities and regional/local advocacy groups to protect water resources.

E. Strategies

Minimum strategies to meet state goals:

- (1) Adopt or amend local land use ordinances as applicable to incorporate stormwater runoff performance standards consistent with:
 - a. Maine Stormwater Management Law and Maine Stormwater regulations (Title 38 M.R.S.A. §420-D and 06-096 CMR 500 and 502).
 - b. Maine Department of Environmental Protection's allocations for allowable levels of phosphorus in lake/pond watersheds.
 - c. Maine Pollution Discharge Elimination System Stormwater Program
- (2) Consider amending local land use ordinances, as applicable, to incorporate low impact development standards.
- (3) Where applicable, develop an urban impaired stream watershed management or mitigation plan that will promote continued development or redevelopment without further stream degradation.
- (4) Maintain, enact or amend public wellhead and aquifer recharge area protection mechanisms, as necessary.
- (5) Encourage landowners to protect water quality. Provide local contact information at the municipal office for water quality best management practices from resources such as the Natural Resource Conservation Service, University of Maine Cooperative Extension, Soil and Water Conservation District, Maine Forest Service, and/or Small Woodlot Association of Maine.
- (6) Adopt water quality protection practices and standards for construction and maintenance of public and private roads and public properties and require their implementation by contractors, owners, and community officials and employees.
- (7) Participate in local and regional efforts to monitor, protect and, where warranted, improve water quality.
- (8) Provide educational materials at appropriate locations regarding aquatic invasive species.

3. Natural Resources

A. State Goal

To protect the State's other critical natural resources, including without limitation, wetlands, wildlife and fisheries habitat, sand dunes, shorelands, scenic vistas, and unique natural areas.