APPENDIX 1 ADDITIONAL DATA AND MAPS

LAND USE & CHANGE

Table 1. Acres of land by land use type

Land Use	2015 (acres)	2022 (acres)	Change 2015-2022 (acres)	Precent of Total Area (2022)
Forest Land	4175.1	4448.8	-273.7	54.4%
Single family/duplex	860.5	939.5	-79.0	11.5%
Agricultural Land	856.1	841.0	15.2	10.3%
Wetlands	821.0	834.9	-13.9	10.2%
Water	398.7	399.2	-0.5	4.9%
Mining	130.0	130.0	0.0	1.6%
Maintained Open Areas	96.2	106.4	-10.2	1.3%
Road right-of-way	78.6	79.2	-0.6	1.0%
Brush or Transitional Between Open and Forested	68.8	78.0	-9.2	1.0%
Disturbed Land	70.2	69.2	1.0	0.8%
Electric, gas and other utilities	65.4	65.4	0.0	0.8%
Solid waste utilities	26.3	26.3	0.0	0.3%
Outdoor recreation	24.3	26.2	-1.9	0.3%
Other Barren Lands	23.4	23.4	0.0	0.3%
Other Agricultural Land	23.0	23.0	0.0	0.3%
Mobile home parks	20.6	20.6	0.0	0.3%
Services	18.3	18.3	0.0	0.2%
Water and wastewater utilities	14.5	14.5	0.0	0.2%
Auxiliary transportation	8.4	8.7	-0.3	0.1%
Government	4.1	6.9	-2.9	0.1%
Educational	5.7	5.7	0.0	0.1%
Rail transportation	5.1	5.1	0.0	0.1%
Commercial retail	2.2	2.2	0.0	0.0%
Vacant Land	1.5	1.5	0.0	0.0%
Communication	0.5	0.5	0.0	0.0%
Multi-family, low rise apartments and townhouses, but not duplexes (1 - 3 stories)	0.4	0.4	0.0	0.0%
Indoor cultural/public assembly	0.0	0.0	0.0	0.0%
Parking structure/lot	0.0	0.0	0.0	0.0%
Grand Total	7799.1	8175.2	-376.1	100.0%

Note: This data is derived from digitized land use data that was prepared by the Strafford Regional Planning Commission according to the NH Land Use Mapping Standard. There is some variation in the methodology for digitizing this data from year to year.

(Source: Strafford Regional Planning Commission Land Use Layer 2024)

ACRES OF CONSERVATION & PUBLIC LANDS

Table 2. Conservation & Public Lands (Source: NH Geodata Portal, Conservation & Public Lands)

Primary Protecting Entity	Total Acres
Municipal/County	
Madbury	694
Portsmouth	545
Lee	5
Dover	2
Federal	
NRCS	158
State	
UNH	348
NH F&G	53
State of NH	6
Private	
SPNHF	279
SELT	19
Total	2110

AGRICULTURAL SOILS

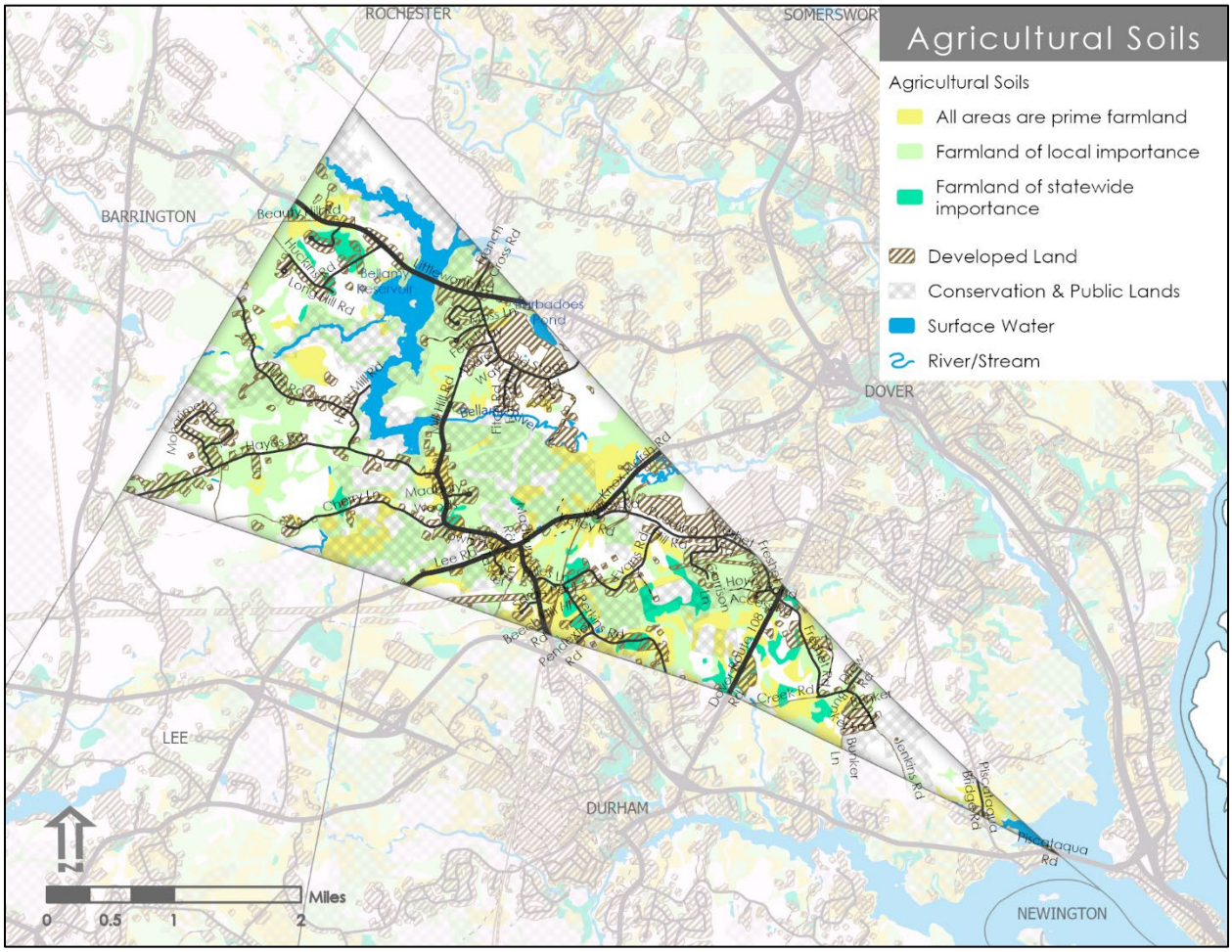

Figure 1. Agricultural Soils (Source: NH Geodata Portal, SSURGO database)

HABITAT TYPES

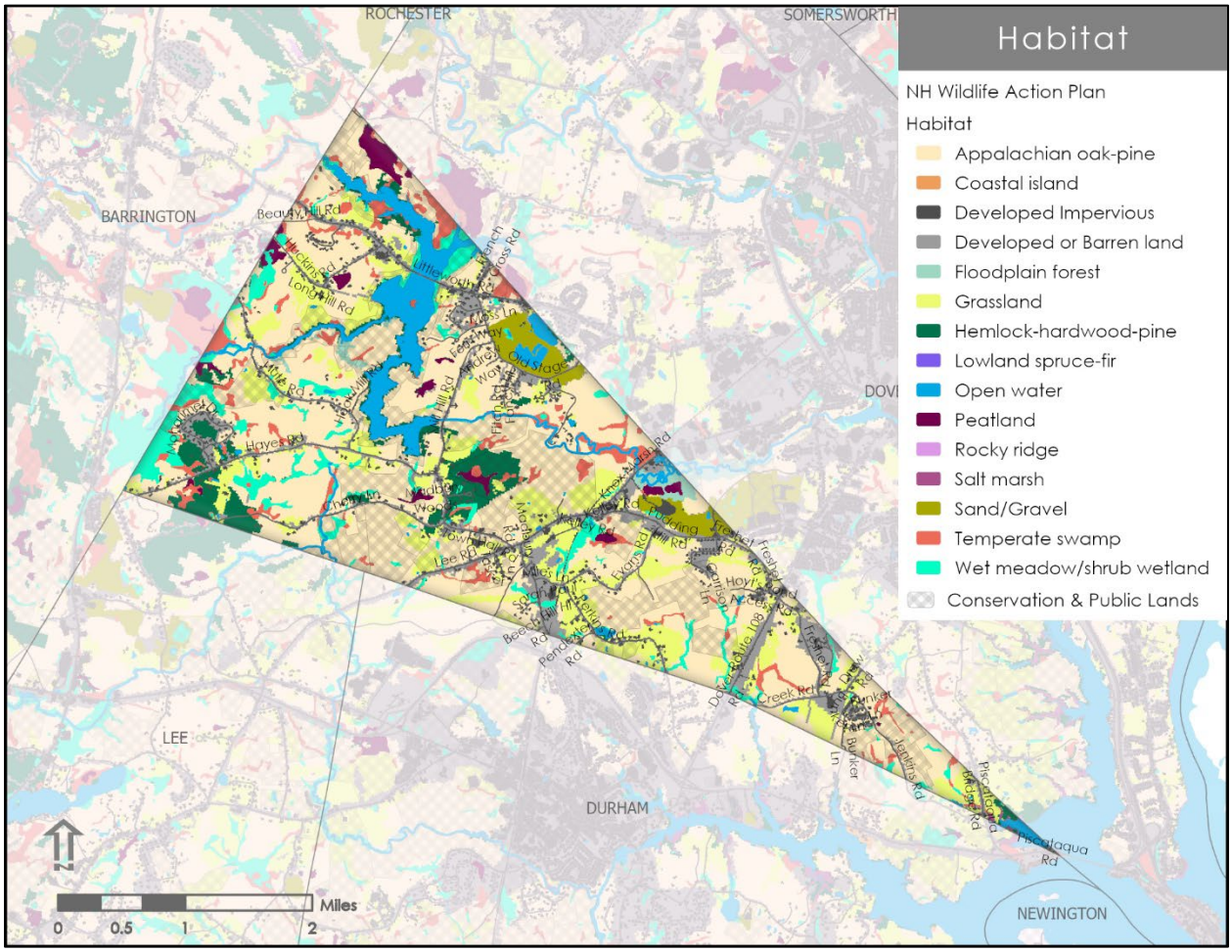

Figure 2. Wildlife Action Plan Habitat Types (Source: NH Geodata Portal, NHFG Wildlife Action Plan)

VALUABLE WILDLIFE HABITAT

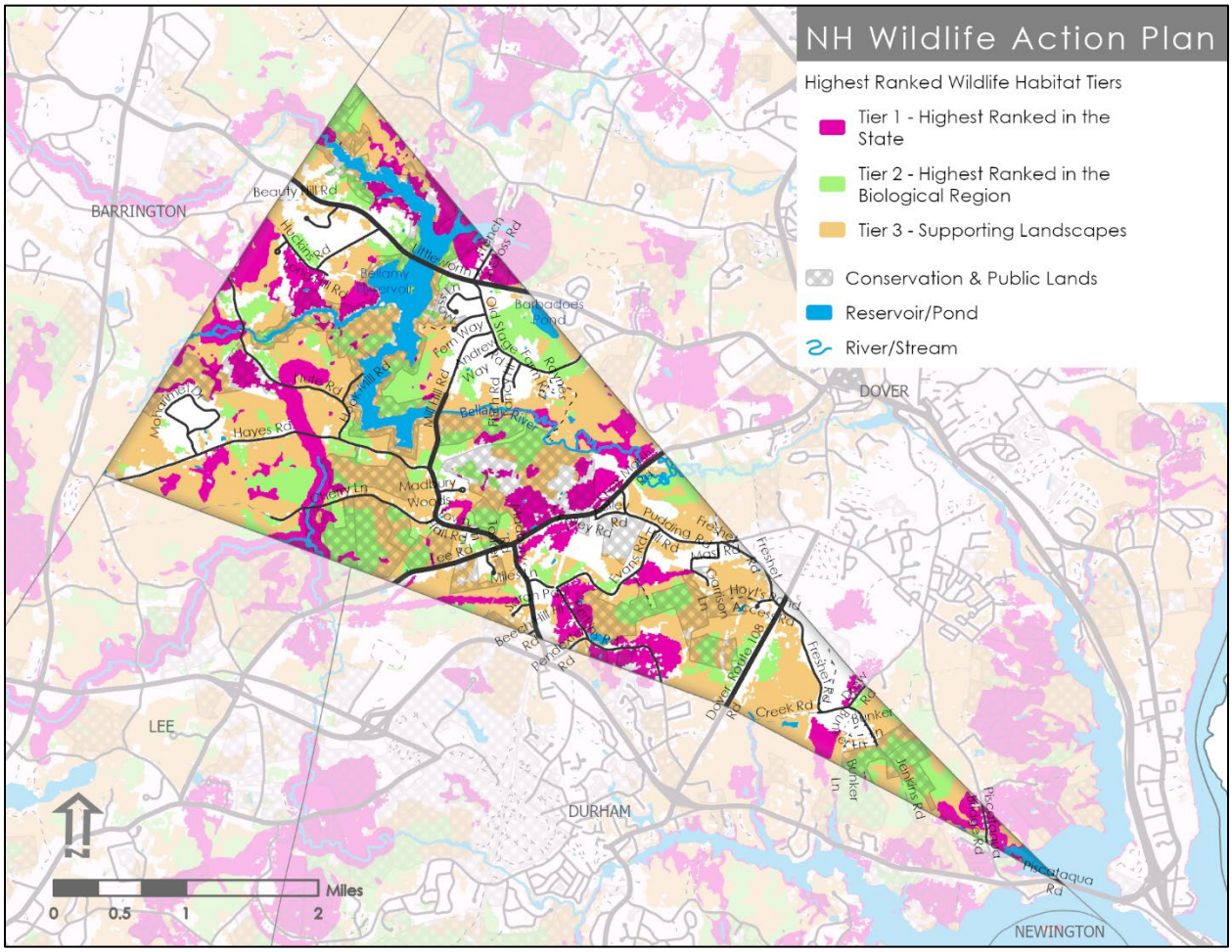

Figure 3. Wildlife Action Plan Highest Ranked Wildlife Habitat (Source: NH Geodata Portal, NHFG Wildlife Action Plan)

Habitat types are ranked in the *New Hampshire Fish and Game Wildlife Action Plan* according to one of four categories based on the condition of the habitat relative to other areas of that habitat in the state and in the biological region. This analysis helps identify the most ecologically intact wildlife habitat areas.

WAP Tier	Acres	% Of total Area of Town	% Protected
1	1255.652	16%	32%
2	1322.3	17%	43%
3	2960.318	38%	28%

WATER RESOURCES

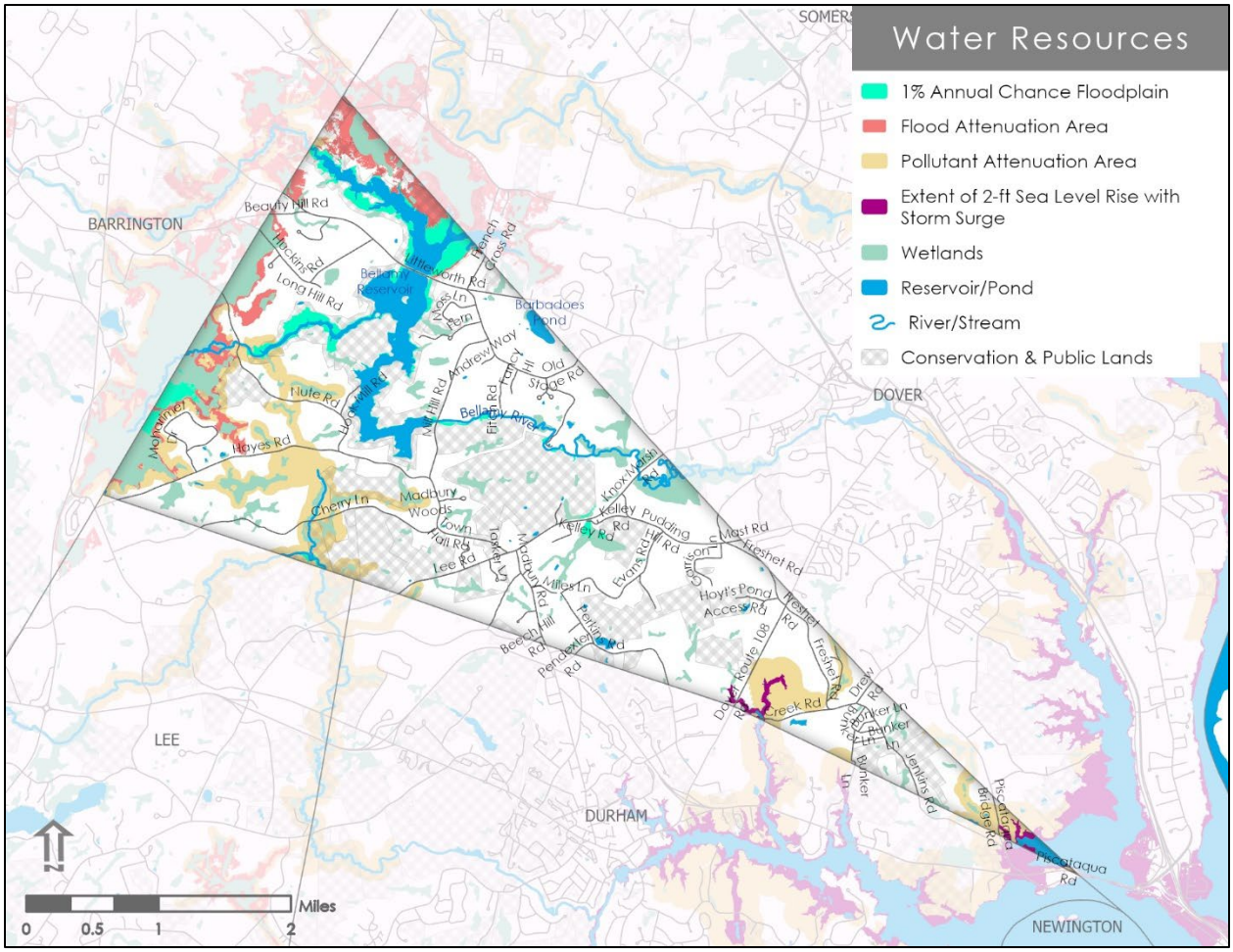

Figure 4. Water Resources (Source: NH Geodata Portal, FEMA floodplain, Sea Level Rise, NWI)

DRINKING WATER

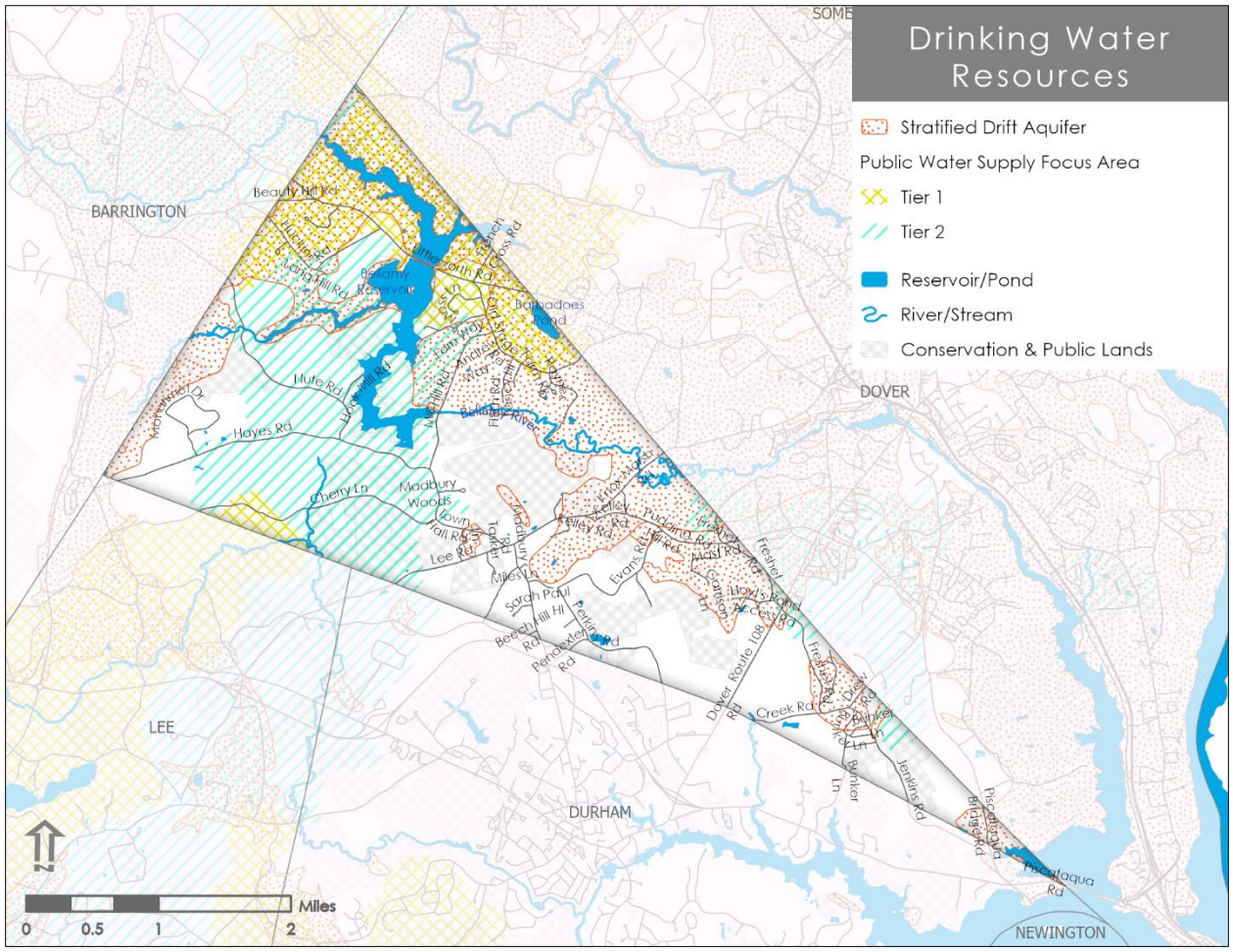

Figure 5. Drinking Water Resources (Source: NH Geodata Portal, Stratified Drift Aquifer, NHDES Public Water Supply Focus Areas)

CONSERVATION FOCUS AREAS

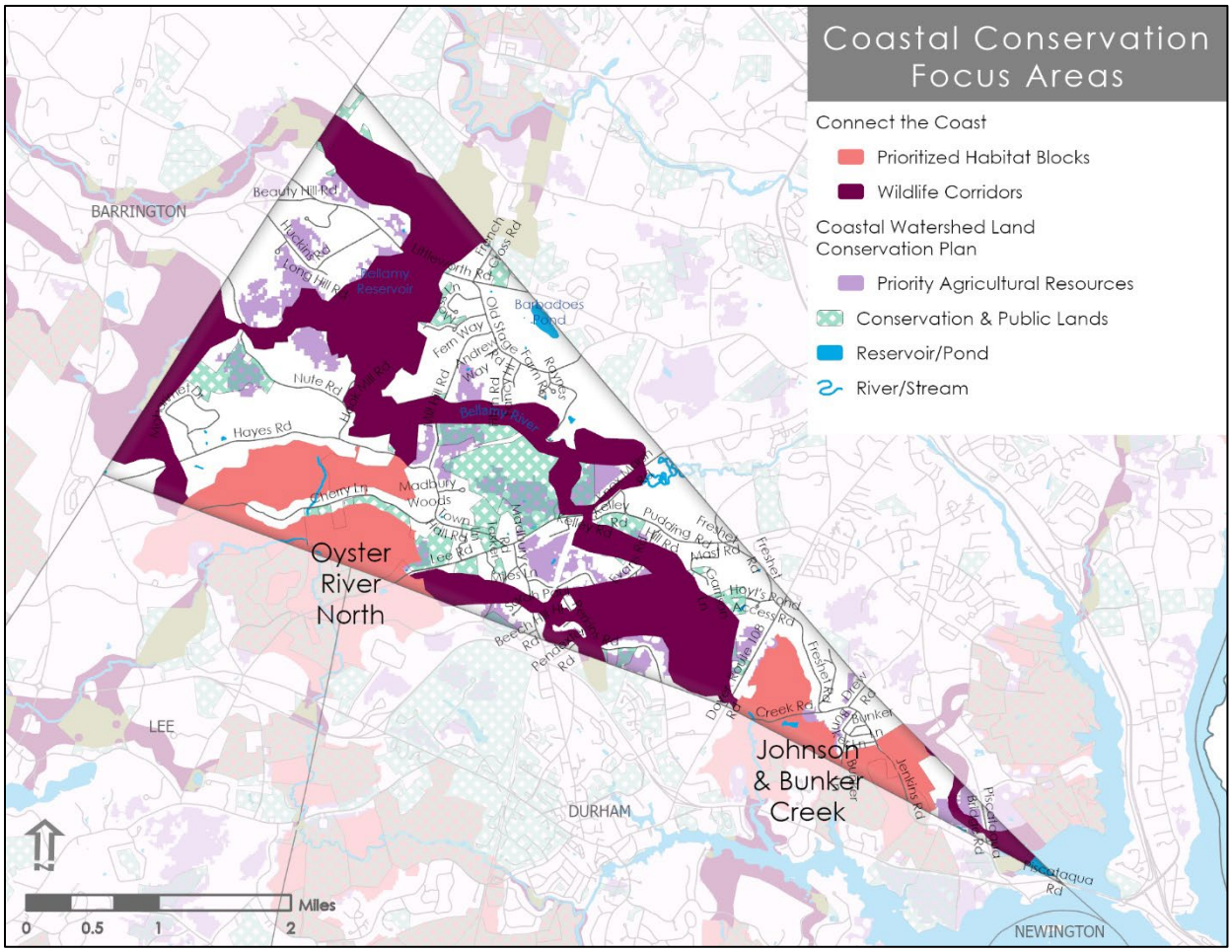

Figure 6. Coastal Conservation Focus Areas (Source: NH Geodata Portal, Connect the Coast)

Within Madbury, less than 20% of these areas coincide with existing conservation and public lands, meaning the remaining 80% are vulnerable to development. Habitat fragmentation in these areas would likely result in the loss of critical ecosystem services, including water filtration and wildlife habitat. Of the 2,278 acres of wildlife corridors in the town, approximately 45% coincide with protected lands within Madbury. While this represents a strong foundation, the remaining 55% is currently unprotected and vulnerable to land-use changes that could impact connectivity in the region.

REGIONAL CONNECTIVITY

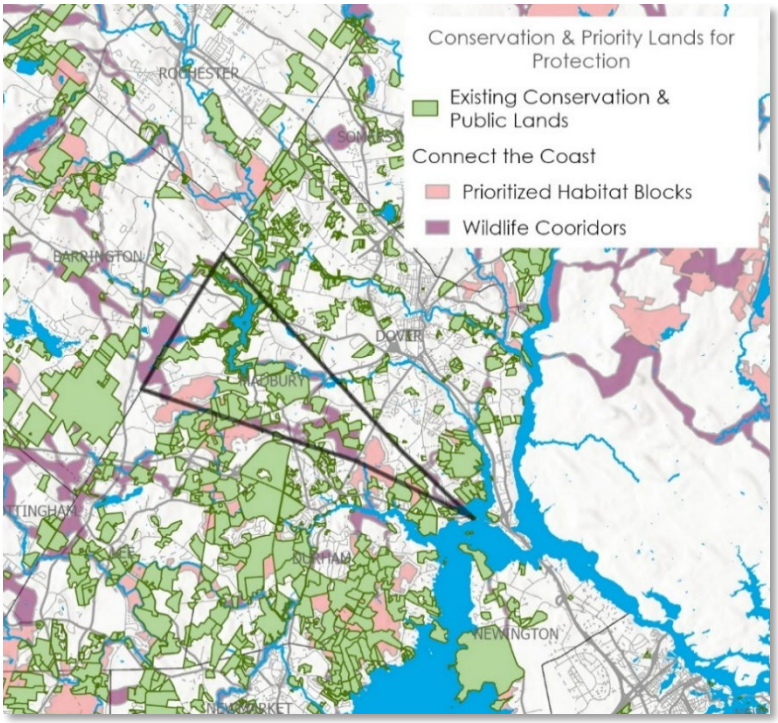

Figure 7. Existing Conservation & Public Lands and priority habitat (Source: NH Geodata Portal, Conservation & Public Lands, Connect the Coast)

Trail users and wildlife do not stop at the town line. Conservation and land protection efforts in Madbury should consider proximity to existing protected and high value habitat.

Madbury shares two regionally significant habitat blocks with the Town of Durham, which represent some of the most critical ecological areas in the Seacoast region: Johnson and Bunker Creek and Oyster River North (Appendix X).[1]

Maintaining connections and migration pathways between habitat areas like these is essential for long-term sustainability of wildlife population.[2] This will be particularly important as changes in temperature and precipitation alter the distribution of habitat, driving wildlife to navigate and occupy new landscapes over time. Refer to the appendix for additional information about habitat and conservation priorities.

POPULATION

[1] Habitat blocks and wildlife corridors are identified in the Connect the Coast, a regional spatial modelling analysis that identified critical wildlife corridors and unfragmented habitat across the New Hampshire portion of the Piscataqua-Salmon Falls watershed.

[2] The Nature Conservancy. Connect the Coast. 2019. https://www.nature.org/content/dam/tnc/nature/en/documents/nh-connect-the-coast-report.pdf

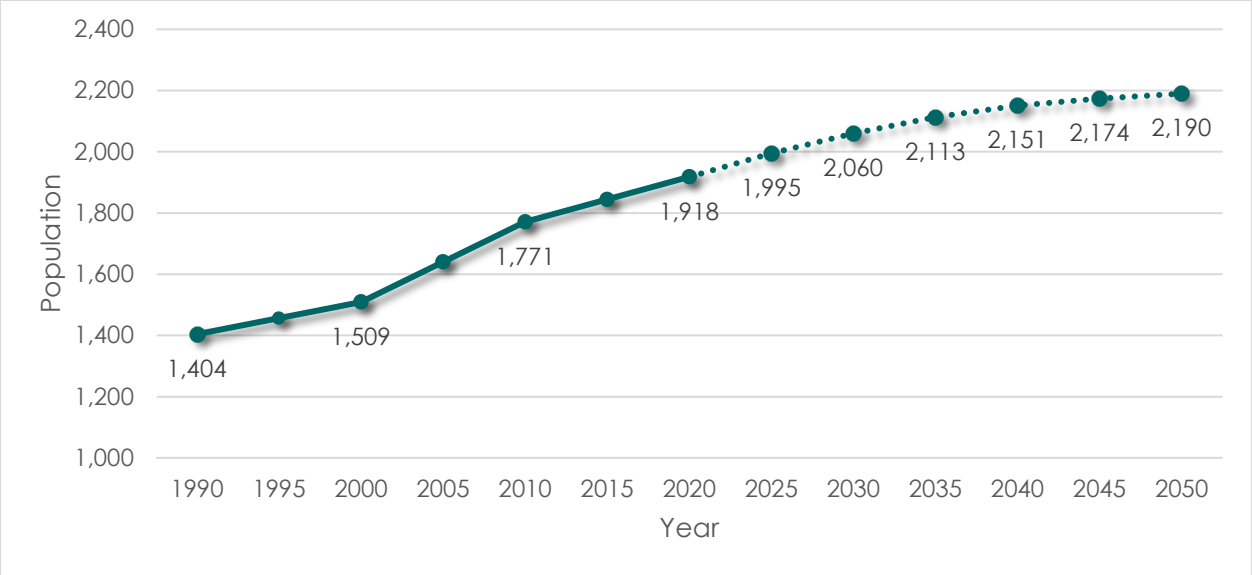

Figure 8. Past and projected population in Madbury
(Source: 1990, 2000, 2020 Decennial Census; OPD 2021 estimates; note: data for 1995, 2005, and 2015 is an average the 5 years before and after)

The NH Office and Planning and Development (OPD) estimates that the population density of Madbury is 169.6 people per square mile. This estimate includes 43 people who live in group quarters, which increases the overall density. Within Strafford County, population density ranges from around 68 people per square mile in New Durham to 1,249 people per square mile in Dover.[3]

There are approximately 612 families in Madbury.[4] Families and other households are discussed further in the Housing Characteristics and Trends Appendix.

[3] NH Office of Planning and Development, 2021 Estimates.
[4] 2017-2022 ACS 5-year estimates

CLIMATE CHANGE

Key Findings from the 2021State of NH Climate Assessment and Key Findings from Updated Science Report

What has changed? [6,5]

TEMPERATURE

- Temperatures across New Hampshire increased by an average of 3°F since 1901.[6]
- There was a 12% increase in annual precipitation over the past 120 years largely due to an increase in heavy precipitation since 1971.
- From 1971-2020, the amount of water stored in the snowpack decreased from 59-91% across central New Hampshire.
- From 1971-2020, spring ice-out dates on Lake Winnipesaukee and Lake Sunapee shifted eight and 11 days earlier, respectively.

GROUNDWATER

- Rising groundwater levels in areas with pre-existing shallow groundwater can heighten food risks, expand wetlands, inundate low-lying urban regions, damage infrastructure, and degrade water quality.
- Climate change will alter groundwater recharge patterns, leading to seasonal water availability shifts in coastal New Hampshire.
- Saltwater intrusion and decreased groundwater discharge to tidal waters pose emerging risks to water quality and estuarine ecosystems.
- Critical knowledge gaps remain in understanding groundwater rise impacts on coastal wetlands in New Hampshire

RELATIVE SEA LEVEL RISE AND HIGH TIDE FLOODING

- Global mean sea level (GMSL) is rising, and the rate of rise is accelerating.
- Relative sea level in New Hampshire is rising more quickly than GMSL.
- There is confidence in the estimate that sea levels in coastal New Hampshire will rise approximately 11.6 inches (295 mm) from 2005 to 2050.
- Sea level rise will increase the frequency of extreme high water levels, leading to more frequent inundation.

COASTAL STORMS

- Storm surge levels from the 1-in-10-year storm (10% annual-chance event) are projected to increase slightly or stay the same in the northeastern United States, including New Hampshire, between 2021–2050 compared to 1951–1980.
- The overall frequency of tropical cyclones (TCs) is expected to decrease or remain stable, but the intensity and associated hazards of these storms will increase due to climate change.
- The frequency of extra tropical cyclones (ETCs) is likely to remain unchanged, though some climate models project an approximately 5% decline in the overall number of ETCs globally by the end of the 21st century.
- Two to 15% of atmospheric river events now directly cause fooding by pushing storm surge higher during high tides.

[5] Coastal Risk and Hazards Commission Science report

[6] Lemcke-Stampone, Mary D.; Wake, Cameron P.; and Burakowski, Elizabeth, "New Hampshire Climate Assessment 2021" (2022). The Sustainability Institute. 71. https://scholars.unh.edu/sustainability/71

CLIMATE CHANGE

What can we expect and plan for?

Increase in:[6,7]

- Average annual max and minimum temperatures by 2.2-2.4°F in the next 20 years, compared to 1980-2009 model averages.
- Annual maximum and minimum temperatures by 5.2-5.4°F under a low emissions concentration pathway and 9.2-9.5°F under a high scenario.
- Hot temperature extremes by 5°F to 12°F statewide.
- Days above 90°F by up to 50-60 days.
- Temperature on the coldest day and night by as much as 12°F and 22°F across northern NH by the end of the century.
- Seasonal differences in precipitation are expected to increase in the coming decades, with precipitation projected to increase 13-32% during the winter and spring, while little change is expected during summer and fall.
- Frequency and intensity of extreme precipitation. The frequency of the heaviest precipitation events could double by the end of the century.
- Shifts in seasonal water availability due to altered groundwater recharge patterns
- Bare ground days due to a decline in snowfall of 20-50% by 2099.

[7] Updated science report CRHC