

NATURAL RESOURCES CHAPTER

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INTRODUCTION

Fremont’s natural resources contribute greatly to the quality of life, economy, and wellbeing of community and surrounding areas. Residents have continuously voiced their support for the protection of these resources through previous iterations of the Master Plan, community surveys and land use regulation development. Furthermore, the citizen survey conducted by the Town as part of the 2020 Master Plan Update revealed that maintenance of open spaces and preservation of wetlands should be town priorities.

Natural resources have become increasingly vulnerable in recent years due to increasing residential and commercial development as well as a changing climate. As a result, there has been an increasing strain on groundwater supply, further degradation of wetlands and loss of open spaces that support critical wildlife habitats. Recognizing these consequences, Fremont seeks to enhance conservation and preservation efforts in town to protect its natural resources, which directly contribute to the quality of life, character, and economic vitality of the community.

The Natural Resources chapter of the Master Plan serves as an inventory of existing resources in town and provides current data to guide and inform future policy decisions and land use planning initiatives. This chapter also aims to increase awareness of the town’s rich array of natural features and the importance of natural resource conservation and preservation. This Natural Resources chapter builds upon and utilizes data from the town’s recently adopted [Natural Resources Inventory Update \(NRI\) \(2020\)](#) and [Open Space report \(2021\)](#).

FREMONT’S NATURAL RESOURCES

FORESTS

Fremont’s land cover is predominantly forested (approximately 45%). Forests provide numerous benefits to the community including enhanced air and water quality, groundwater infiltration, soil stabilization and erosion control and biological diversity. Forests also help regulate the climate by trapping moisture and storing large amounts of carbon dioxide. Fremont’s town forests are valued for their scenic, recreational, and economic amenities, which include hiking, walking and ATV trails, hunting grounds, opportunities for maple syrup production and steady supplies of home firewood, and commercial wood products.

Fremont town forests are managed by the Conservation Commission under direction of the Town Forester. The Conservation Commission aims to maintain diverse and healthy forest systems by monitoring and managing invasive species, pests and diseases as well as promoting outreach and education among the public on the value of forests. The following are publicly accessible forests in Fremont (Map 13 in Appendix A):

- Oak Ridge Town Forest encompasses 189.4 acres, with wetlands accounting for a substantial area and bisecting the property into north and south sections.
- Glen Oaks is a 388-acre parcel of wooded land that borders the southeast edge of Spruce Swamp. This Town forest is an upland buffer that provides essential protection for the swamp, which is the largest wetland in Rockingham County and is designated prime by the Town of Fremont.
- The Cooperage Town Forest is 53 acres and was donated to the Town by Frank Catapano of Beede-Spaulding Inc., the developer of a conservation subdivision in Fremont, in 2014.
- The Southeast Land Trust (SELT) now owns 539.36 acres in Fremont. SELT allows public access including hunting unless the seller/donor stipulates otherwise. SELT does NOT allow off-highway recreational vehicles (OHRVs) and enforcement is strict.

OPEN SPACE

Preserving open space is imperative for protecting wildlife, wetlands, groundwater, and other natural and historic features. Open space also provides aesthetic and recreational amenities to the community, enhances property values, and requires fewer municipal services (e.g., roads, emergency services etc.). In Fremont, land is conserved and protected through (but not limited to) acquisition, easements, deed restrictions and local land use regulations. Additionally, some large areas of protected land are part of the town forests as well as state and privately owned. As of 2021, 14.3% (1595 acres) of the town's land is permanently protected by conservation easements and deed restrictions. As stated in the Natural Resources Inventory, the town's goal is to conserve 25% of undeveloped land.

Fremont has large parcels of land in the Current Use Program, which incentivizes property owners with ten or more undeveloped acres to keep their land in an undeveloped state (RSA 79). The assessed value is based on the ability of the land to produce income in its undeveloped state as opposed to income by developing this land. Land in this program can be a managed farm or forest or unmanaged open space.

With the help of the [Open Space Advisory Committee](#), the Fremont Conservation Commission inventories, manages, and protects the town's natural resources, including open space and conservation lands. The Commission's recently adopted [Open Space Report](#) serves as a guide for open space planning in town. This report details the evaluation process for land conservation and provides guidance to the town boards and staff on the best ways to preserve and utilize open space in town.

There are several other significant resources in New Hampshire related to open space and wildlife conservation. These resources provide the most current data that support land conservation efforts:

- [New Hampshire's Coastal Watershed Conservation Plan, 2021](#)
- [Land Conservation Priorities for the Protection of Coastal Water Resources](#)
- [Southeast Land Trust of New Hampshire](#)
- [New Hampshire Land & Community Heritage Investment Program](#)

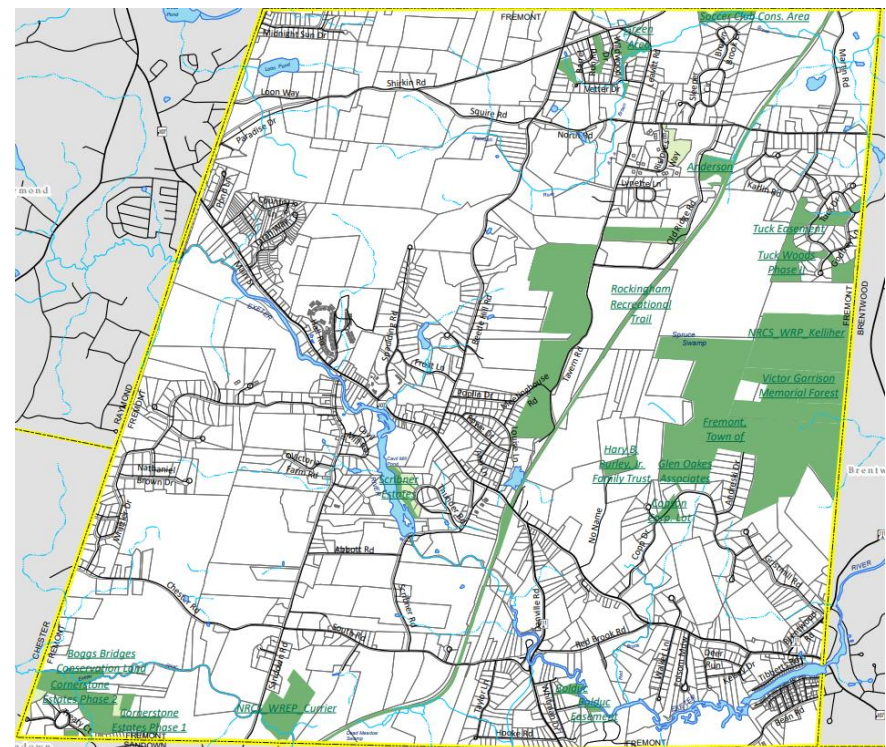


Figure 1: Fremont conservation lands (Map 8 in Appendix A)

GEOLOGIC SOILS

Soil is defined as the unconsolidated mineral or organic material on the immediate surface of the Earth that serves as a natural medium for the growth of land plants.¹ Understanding soil characteristics is important for land use management and natural resource protection.

Like the rest of New England, Fremont was shaped by glacier action over 10,000 years ago. The motion of the glacier moved large amounts of rock and soil materials and smoothed the surface, giving a more rounded appearance to the surface.

The U.S. Forest Service has divided New Hampshire into the following three principal biophysical or ecological regions or sections:

- Southern New England Coastal Plain and Hills Section (southeastern part of NH).
- Vermont-New Hampshire Upland Section (southwestern part of NH); and
- White Mountain Section (Northern part of NH).

Fremont is in the Southern New England Coastal Plain and Hills Section which can be further divided into three subsections:

- Gulf of Maine Coastal Lowland (immediate coastal region);
- Gulf of Maine Coastal Plain (southern portion); and
- Sebago-Ossipee Hills and Plain (northern portion).

Fremont is in the Gulf of Maine Coastal Plain, a subsection characterized by broad, hilly plateaus and drumlins leading to the coastal zone.

AGRICULTURAL SOILS

A widespread value throughout New Hampshire is the preservation of rural character and agricultural heritage. Preserving agricultural production requires the maintenance and protection of soils that allow for successful agricultural opportunities. The following are three classifications of farmland soils, also displayed on Maps 3 and 4 in Appendix A:

- Prime Farmland soils are soils that have the best physical and chemical properties for producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management.²
- Farmland of State Importance is land, in addition to prime farmland, that is of statewide importance to produce food, feed, fiber and forage.
- Farmland of Local Importance: In some local areas, there is concern for certain additional farmlands to produce food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance.

While agriculture is no longer the predominant land use in Fremont, there remain a few active farms in town. These farms greatly contribute to the rural, historical, and aesthetic quality of the community and support a variety of wildlife habitats. Agricultural land is economically valued in in Fremont for food production and agritourism. Fremont's farmers help others connect with the town's rural heritage and promote better land management. Preserving Fremont's productive farmland will help ensure locally grown produce and a sustainable future for the citizens of Fremont. As of 2015, 3% (384.8 acres) of Fremont's land cover is dedicated to active agriculture. However, agricultural land has decreased over time due in part to increased residential and commercial development.

WATER RESOURCES

Fremont's water resources include streams, rivers, wetlands, and groundwater. Water resources are imperative to the community because all residents rely on private wells for drinking water. Areas of significance such as Spruce Swamp and the Exeter River additionally provide numerous recreation opportunities as well as for healthy, diverse ecosystems that support wildlife. The following are significant water resources in Fremont:

WETLANDS

Wetlands are an integral component of Fremont's natural landscape. Wetlands are important for filtering nutrients and pollutants from water, retaining runoff and

¹ https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054280

² <https://www.lawinsider.com>

storing floodwater, replenishing groundwater, and providing habitat for diverse populations of vegetation and wildlife. Additionally, wetlands provide opportunities for community recreation and education.

Approximately 21% (11,142 acres) of Fremont's landscape is made up of wetlands of varying types including forested/shrub wetlands, emergent, unconsolidated bottom wetlands, lacustrine and riverine wetlands. Each wetland type has unique ecological features that support distinct habitats for vegetation and wildlife. The U.S. Fish and Wildlife Service has mapped wetlands from aerial photos as part of a National Wetlands Inventory (NWI). The NWI does not include all wetlands, particularly those that are small or do not have standing water in the Spring. Therefore, the NWI data is an underestimate of the total amount of wetland coverage in the area.

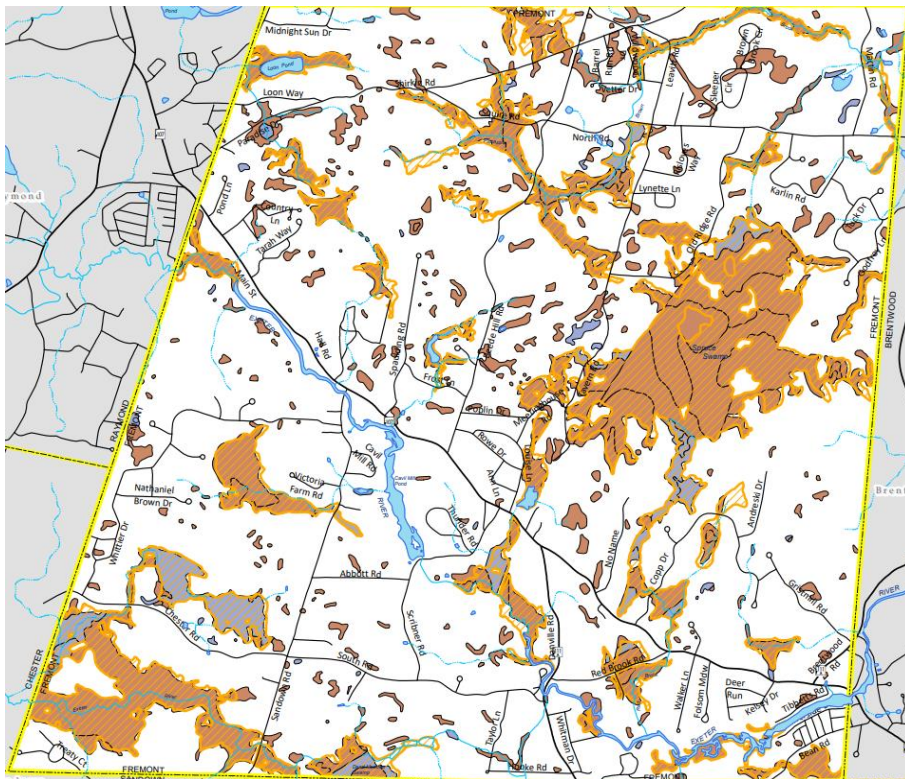


Figure 2: Wetlands (See Map 7 in Appendix A)

Prime wetlands are defined by RSA 482-A:15 as “any areas falling within the jurisdictional definitions of RSA 482-A:3 and RSA 482-A:4 that possesses one or more

of the values set forth in RSA 482-A:1 and that, because of their size, unspoiled character, fragile condition, or other relevant factors make them of substantial significance.” Prime wetland designation is given by the NH Wetland Bureau following the completion of a wetland study consistent with the process outlined in the RSA.

In 2007, West Environmental, Inc. prepared a ‘Wetland Evaluation Report’ for Fremont to identify wetlands that qualify for Prime Wetland Designation. Fifty-five wetlands were evaluated to assess the comparative function and value of each wetland, twenty-six of which were designated Prime Wetlands by the State of New Hampshire. The full study can be viewed at the Town Land Use Office. See Map 7 in Appendix A for wetland areas in Fremont. The following are Fremont's largest wetland complexes:

- Spruce Swamp
- Spruce Swamp South
- Piscassic River Headwater
- Tilton Swamp
- Bog Meadow Wetlands

Spruce Swamp is the largest wetlands complex in Fremont and Rockingham County. The area of the swamp is 827 acres, 711 of which are prime wetlands. The Swamp is over 2 miles long from north to south 1.5 miles wide from east to west. Spruce Swamp is drained by four streams, two flowing north towards the Piscassic River, one flowing east towards the Exeter River, and one flowing south towards the Exeter River. The swamp is located over a large aquifer and has a diverse plant community, including vast area of scrub-shrub, forested marshes, and large shallow marshes. Beaver impoundments control significant portions of this wetland systems hydrology. **Wetlands ecologists consider Spruce Swamp to be one of the few remaining unspoiled ecosystems in southeastern New Hampshire.** For more information about Spruce Swamp view Fremont's Natural Resources Inventory.

“Our wetlands are critical features in need of protection because they sustain high quality drinking water, which we all need access to.” – Fremont resident 2019 Master Plan Survey

SURFACE WATER

Fremont has an extensive network of surface waters consisting of rivers and streams connected by wetlands complexes and ponds. As of 2015, surface water accounted for 230 acres or 2% of land area in town (not including wetlands). There are 17 intermittent streams in town, most of which, flow seasonally and are in areas with poorly drained soils.



Figure 4: Exeter River in Fremont (photo credit: Nancy Murray)

These rivers provide essential habitat and travel corridors for wildlife species.

Fremont lies within both the Exeter and Lamprey River watersheds. The Exeter-Squamscott River watershed drains an area of approximately 128 square miles (81,726 acres) and includes portions of 12 towns in southeastern New Hampshire. The Exeter-Squamscott River is one of two rivers that bring most of the fresh water into Great Bay Estuary, a tidal estuary encompassing over 6,000 acres, that provides critical habitat for fish and wildlife. The Piscassic River flows 15.3 miles from west to east across the northernmost portion of Fremont and into Brentwood. The Piscassic River is one of the major tributaries of the Lamprey River, which drains an area of approximately 212 square miles across fourteen towns and is designated as a National Wild and Scenic River by the U.S. Congress.

Both the Piscassic and Exeter rivers are part of the [NHDES Rivers Management and Protection Program](#) because of their natural and cultural significance. Each river has a Local River Management Advisory Committee, responsible for developing a river management plan and coordinating activities affecting the river on a regional basis. Visit the [Exeter-Squamscott River Local Advisory Committee's \(ESRLAC\) website](#) for more information and to view the [ESRLAC Management Plan](#). Visit the [Lamprey River Advisory Committee webpage](#) and [Management Plan](#) for more information on the Lamprey and Piscassic Rivers.

GROUNDWATER

Fremont is a rural community that contains one of the largest areas of stratified drift aquifers within coastal New Hampshire. Of the 4,739 residents in the town, only 144 are serviced by one of three community water systems. Groundwater delivered via private wells serves is the only drinking water sources for 96% of residents. Protection of the groundwater resources within Fremont is critical for existing public water systems, potential future public water systems, and for the majority of residents that will continue to rely on groundwater for drinking water.

Groundwater is vulnerable to contamination from a variety of human activities including, leaking underground storage tanks, mishandling of hazardous materials, poorly maintained septic systems and storage and use of road salt. Land development patterns also influence groundwater and contribute to decreased water quality. The increase of impervious cover related to the construction of buildings, roads and parking areas causes water to run off the land more quickly, often carrying sediment and pollutants from surfaces into nearby waterways. This type of run-off is the most serious threat to water quality for New Hampshire communities. Covering the landscape in impervious surface also prevents adequate recharge of groundwater aquifers. Increased development strains groundwater resources through increased rates of withdrawal and the alteration of topography.

WILDLIFE

Healthy wildlife populations and habitats provide numerous ecological and economic benefits to New Hampshire communities. According to the State's [Comprehensive Outdoor Recreation Plan](#), outdoor recreation accounts for \$8.7 billion in annual consumer spending and supports tens of thousands of jobs statewide. Each year, thousands of NH residents and tourists partake in outdoor activities in New Hampshire for scenic and recreation purposes. Any downturn in participation in these activities would have a negative impact on the state's economy, whereas efforts to improve wildlife and habitat in New Hampshire would likely bring more

revenue into the system for hunters, anglers, wildlife watchers and outdoor enthusiasts.³

According to New Hampshire Fish and Game's Wildlife Action Plan, a significant portion of Fremont's landscape is designated as the highest ranked wildlife habitat by ecological condition in the state or biological region (Map 9 Appendix A). [The Natural Heritage Bureau](#) identifies threatened and endangered species in Fremont including several species of plants, reptiles, and fish. See Map 12 for general locations of rare plants, wildlife, and natural communities (natural communities are different types of wetlands, forests, etc.). For a complete list of species of greatest need for conservation in Fremont, see the town's Natural Resources Inventory.

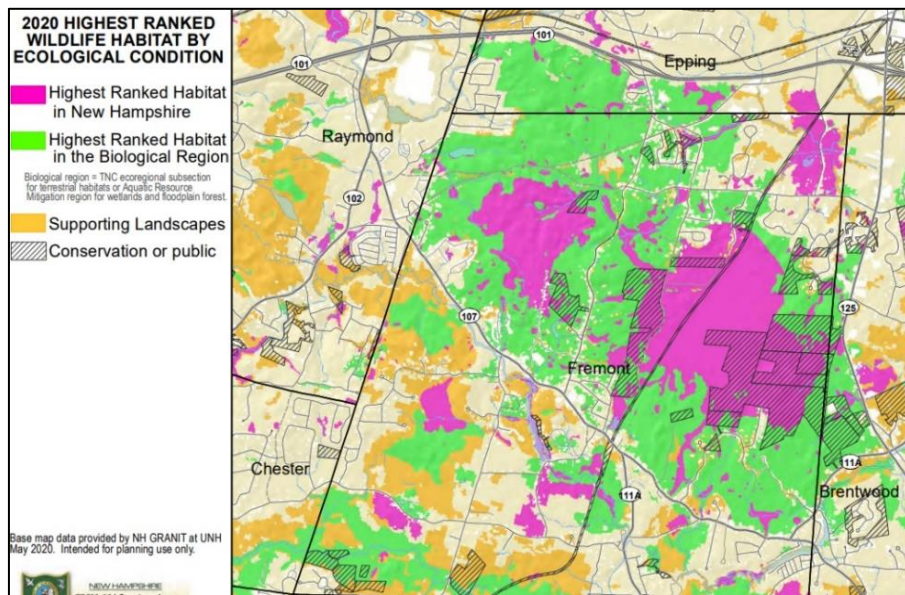


Figure 5: 2020 Highest Ranked Wildlife Habitat by Ecological Condition (Map 9 in Appendix A)

KEY ISSUES & CHALLENGES

MAINTAINING OPEN SPACE

The loss of open space changes the traditional forest and agricultural landscape of the community, which destroys wildlife habitat, worsens water quality, and impacts outdoor recreation opportunities. Therefore, protecting open space is vital to the

wellbeing of the community. In addition to maintaining conservation easements in town and prioritizing parcels for protection, The Fremont Conservation Commission and Open Space Committee work to increase education and awareness among landowners of the importance of land conservation and options for preserving their land in its natural state. Since 2010, 144 acres and two miles of trail system have been added to the town's forests. The Open Space Committee and Conservation Commission are currently working with the Southeast Land Trust (SELT) to enhance connection between the town's trails to conservation lands.

Managing land development is important for maintaining open space. This can be achieved through the adoption of innovative land use regulations such as open Space or cluster development. The purpose of open space development is to encourage more efficient land development patterns that preserve open and green spaces, farmland, scenic areas, and other natural resources. Fremont's Open Space Preservation Development ordinance requires all land not included in the building lots to be dedicated as permanently preserved open space. Similarly, Fremont's Elderly Open Space Ordinance incorporates open space development components for elderly housing projects.

Similarly, preserving and promoting agriculture in town is important to Fremont. Agricultural operations contribute to the character, local economy and health and wellbeing of the community. Additionally, local agriculture provides numerous recreational, social, and educational opportunities to residents and visitors. Currently, agricultural activities are permitted throughout Fremont, however, the town's land use regulations should be reviewed to ensure consistency and flexibility for the establishment of not only farms but farm stands, farmer's markets, community gardens or other agriculture activities. The [Local Regulation of Agriculture Toolkit](#) produced by the NH Coalition for Sustaining Agriculture can be used to help understand if the town's regulations are "farm friendly." Fremont may also wish to establish an Agricultural Commission (NH RSA 674:44-e) to advise town boards and staff as well as advocate for the needs of agriculture in the community.

"I would like to see more agriculture in town, more local food. Our open spaces should be preserved for agriculture, especially where there are good soils. Having rural character provides the opportunities for more community involvement." – Fremont resident 2019 Master Plan Survey

³ <https://www.wildlife.state.nh.us/wildlife/documents/wap/executive-summary.pdf>

GROUNDWATER PROTECTION

Water quality has a direct impact on the well-being, public health, and economic vitality of the community. Increased land development and land alteration greatly contribute to water quality degradation from increased rates of stormwater runoff and pollution. Land development increases impervious surfaces, which results in reduced infiltration of rain and snowmelt into the ground, disrupting the process of groundwater recharge. Additionally, increased development causes greater demand for water, leading to increased rates of withdrawal, contributing to aquifer depletion. See Map 11 for total impervious coverage in Fremont.

As most Fremont residents rely on private wells for drinking water, groundwater contamination is a major concern. While NHDES regulates well drillers and pump installers, it does not regulate the quality of water obtained from private wells. Homeowners are responsible for testing their own private well water and obtaining appropriate treatment.⁴ Public education is essential for helping ensure landowners have the information they need to make informed decisions about their water supply. Currently, the Fremont Conservation Commission provides educational materials such as [The Citizen's Guide to Protecting Fremont Water Resources](#) to residents and businesses on individual actions landowners can take to help protect their water. In the future, the town may consider requiring the testing of private wells when homes are built and sold.

Fremont has also implemented land use regulations to protect groundwater resources. Fremont's Aquifer Protection District, which covers a substantial portion of the town, requires greater lot sizes (3 acres) and an impervious cover limitation of 15%. Within the aquifer protection district, activities such as hazardous and solid waste storage are prohibited. The town also enforces stormwater management standards for both pre and post construction activities for all site plans and major subdivisions. In 2018, Fremont updated its zoning ordinance to increase protection of groundwater from potential contamination sources by enacting standards to reduce the risk of potential pollution and to increase filtration.

Fremont recognizes that more is needed to protect ground water supplies, especially as development and demand for water increases over time. Strengthening local regulations is one approach to protecting water resources. As part of its Aquifer

Protection Ordinance update, Fremont enacted an inspection program to ensure compliance with NHDES's groundwater protection BMP rules (Env-Wq 421). Under this program, a designated agent (typically building inspector or health officer) would inspect handling and disposal practices of hazardous substances by businesses in town to ensure that the handling of these substances does not result in groundwater contamination. Fremont is currently evaluating the feasibility of engaging a consultant to assist with inspections for this program. Another approach could be to require hydrogeologic studies to be performed for all development within the Aquifer Protection District. Currently, the need for hydrogeologic studies is determined on a case-by-case basis. However, as development increases, the Planning Board may consider enforcing this section of the ordinance more often.

"If our natural resources, especially our drinking water are not protected from contamination and excessive withdrawal then the character of the Town will be profoundly changed. Protecting our wetlands and their upland forests go hand in hand with protecting our drinking water!" – Fremont resident, 2019 Master Plan survey

WETLANDS CONSERVATION

Fremont has large areas of wetlands, which contribute to enhanced water quality, flood protection, groundwater recharge and critical habitat for wildlife. Land development near wetlands and water bodies disrupts these important ecosystems, which is why riparian buffers are important to conserve and maintain. Riparian buffers filter runoff from impervious surfaces before they reach the wetland or water body. Fremont's current Wetlands and Watershed Protection District ordinances regulate development within these natural areas. The town's zoning requires a 100-foot buffer around wetlands and a 150-foot buffer around certain water bodies including the Exeter River, Piscassic River, Loon Pond, Red Brook, and Brown Brook. In addition to land use regulations that protect wetlands and water bodies, public education is needed to inform landowners of how they can minimize impacts to wetlands and buffer areas such as limiting the use of lawn fertilizers and mowing in buffers, planting native plants that are beneficial to wildlife and not disposing yard waste in wetlands buffers.

WATERSHED MANAGEMENT PLANNING

⁴ <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/wd-07-29.pdf>

Regional watershed planning considers natural resources in a broader perspective. Air, water, wildlife, and forests transcend municipal boundaries and therefore, require a more integrated and collective approach for conservation and protection. For example, water quality in tributary rivers such as the Exeter River affects the Water quality in the Great Bay. Land use patterns and pollution from runoff, septic systems, wastewater treatment plants etc. all contribute to the quality of water in both the immediate vicinity as well as downstream water bodies. For this reason, it is the collective responsibility of all communities in the watershed to address the threats to water quality. Municipalities in the Exeter River watershed including Fremont have implemented a variety of land use regulations designed to protect water quality and maintain water quantity. These regulations include stormwater management requirements for erosion control and drainage, aquifer protection ordinances regulating the types of land use activities that can occur over groundwater aquifers, wellhead protection regulations to protect areas around municipal and community wells, prohibition of development in floodplains, septic system requirements more stringent than state standards, and regulations establishing development setbacks from wetlands and surface waters.

Both The Exeter-Squamscott River and the Lamprey River watersheds have Local Advisory Committees, which are comprised of representatives from each town in the both watersheds and are responsible for developing and implementing the [Exeter-Squamscott River Management plan](#), and the [Lamprey Rivers Management Plan](#). These plans provide information on land use patterns within the watersheds, data on water quality and recommended actions to municipalities for protecting the river corridors. The purpose of the management plans is also to improve public awareness and understanding about the environmental and economic value of the rivers. However, stronger municipal coordination and engagement is needed to ensure the protection of the town's rivers and streams.

PRESERVING WILDLIFE HABITAT

One of the greatest threats to wildlife today is habitat fragmentation due to land development. Fragmentation reduces the quality of habitat by altering its size, shape, and distribution, creating more “edge” and less “interior.” Many species such as turtles and amphibians require multiple habitat types to support their life cycles. Larger animals require the ability to move through larger and multiple habitat blocks. Urban sprawl is the primary culprit for habitat fragmentation as lots today are much

larger and spread out, in part to protect residents' private wells. According to Fremont's Natural Resource Inventory, the town's current residential and commercial development affects 115 species designated as those in greatest need of conservation. Among those species, the New England Cottontail, Karner Blue Butterfly, and the Blanding's and Spotted Turtles are at greatest risk.

Landscape fragmentation by roads adds an additional layer of challenges and complexities for wildlife. Roads present both real and perceived barriers—where wildlife-vehicle collisions result in mortality and where risk avoidance restricts movement. Runoff from roadways and cars often carries harmful herbicides, salt, and other chemicals, which not only harms plants and animals but also seeps into groundwater. There are several strategies that can be adopted to mitigate the effects of transportation corridors on wildlife, detailed in the recent study [Connect the Coast: Linking Wildlife Across New Hampshire's Seacoast and Beyond](#).

The study recommends best management practices for managing land use development to reduce habitat fragmentation. See Map 14 for recommended wildlife corridor connections based on regional conservation plans and state wildlife action plans. Maintaining large blocks of unfragmented land as well as wildlife corridors are essential for healthy ecosystems and wildlife populations. Fremont has begun to address habitat fragmentation through the adoption of land use regulations that allow for conservation subdivisions. Conservation subdivisions require a significant portion of the development site to remain as open space. However, the town recognizes the need to do more to protect wildlife and critical habitats and has identified potential actions to address this need including incorporating data and maps from the Wildlife Action Plan in to land use regulations and increasing public awareness through targeted education and outreach campaigns.

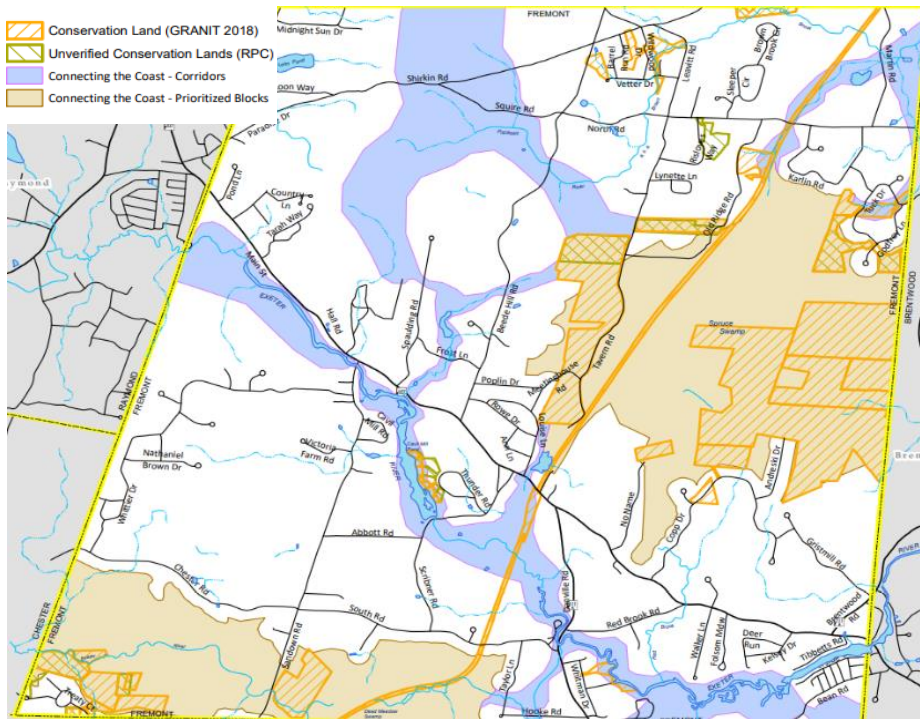


Figure 6: CTC Wildlife Corridors (Map 14 Appendix A)

ADAPTING TO CLIMATE CHANGE

As the climate warms, changes in precipitation patterns, extreme temperatures, sea level rise and increased storm events may have widespread impacts on New Hampshire communities. Rising temperatures and precipitation will likely increase the frequency and intensity of droughts and flooding events, which affects everything from agriculture to infrastructure, public health, water resources and wildlife habitats.

Climate change impacts ecosystems by disrupting relationships between species. Shifting rainfall patterns and changes in temperatures may influence the timing of species migration and allow certain species to live longer and expand their habitat

range. For example, prolonged warmer temperatures have allowed invasive species such as the hemlock woolly adelgid to live longer and move further North. This species is responsible for killing Hemlock trees, which are prime habitat for the blue-headed vireo and Blackburnian Warbler.⁵ This invasive species has been found in Glen Oaks Forest and is expected to become more prominent as temperatures fluctuate. Additionally, prolonged, warmer seasons increases the life span of disease-carrying ticks, which are most active when temperatures are above 45 degrees Fahrenheit. This is leading to a rise in the number of Lyme Disease cases throughout New England.

Climate change is expected to further strain water resources. Increased precipitation and shifting rainfall patterns will likely change the availability of water for both human and wildlife consumption. Similarly, increased periods of drought will impact the rates at which aquifers are recharged. Increased flooding from changes in precipitation is already happening and projected to worsen over time. These flooding events will result in increases in stormwater runoff, which contributes to increased nutrient contamination of streams, rivers, and wetlands. Increased flooding will also strain municipal resources as infrastructure will likely need to be upgraded more frequently to handle intensifying flooding.

Maintaining natural areas, open space and wetlands are important strategies for mitigating the impacts of climate change. These natural features act as flood storage areas; absorbing and filtering floodwater and stormwater runoff, which protects humans and wildlife systems. Public outreach, education and collaboration among municipal officials, boards and committees is also needed to address the range of impacts that will affect the community as the climate continues to change.

CONCLUSION

This chapter of Fremont's Master Plan illustrates the community's existing natural resources and the challenges of maintaining and preserving those resources. Fremont has already undertaken many efforts to preserve the town's natural resources through the enforcement of land use regulations that promote land conservation and water protection, education and outreach to residents and landowners, and through recent updates to the town's Natural Resources inventory and Open Space Plan. The town recognizes the need to protect its natural features

⁵ <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-nh.pdf>

for ecological, economic, and recreational purposes from increasing development and climate change impacts.

The following recommendations and subsequent implementation plan outline short- and long-term objectives for protecting the community's natural resources and outlines specific actions ranging from land use regulation development, coordination with local and outside organizations and outreach and educational activities needed to accomplish the objectives. Recommendations from Fremont's Natural Resource Inventory were used in the development of the Natural Resources Master Plan chapter and are highlighted at the end of the Implementation Plan.

RECOMMENDATIONS

The following objectives were formulated concerning natural resource protection in town. Each objective has a series of action items in Table 1.

1. Protect the quality and quantity of Fremont's water resources including groundwater, surface water and wetlands from the impacts of development.
2. Continue to preserve and maintain the town's open spaces and forests. Increase the amount of conservation land in town.
3. Protect wildlife and wildlife habitats from the impacts of development.
4. Protect the community and natural resources from the impacts of climate change including but not limited to increased flooding, droughts, and extreme temperatures.

Fremont Master Plan – Table 1: Natural Resources Chapter Implementation Plan

Recommendation 1 – Protect the quality and quantity of Fremont’s water resources including groundwater, surface water and wetlands from the impacts of development.					
	Responsible Party	Timeframe	Cost (if known)	Funding Source	Progress, Year:
Action Item #1 – Amend the zoning ordinance to require hydrogeological studies for all multi-family development to ensure the protection and conservation of the town’s drinking water supply.	Planning Board	1-3 years	unknown	Unknown	
Action Item #2 – Engage a consultant to conduct routine groundwater best management practice inspections of commercial and multi-family developments in town.	Building / Code Enforcement	Unknown	Unknown	Town budget	
Action Item #3 – Continue to review and evaluate existing water protection ordinances (aquifer protection, wetlands, floodplain development) and update as necessary to ensure consistency with state or federal guidelines.	Planning Board	Ongoing	Unknown	RPC dues	
Action Item #4 – Conduct outreach to landowners and businesses in the Aquifer Protection District on how they can manage their land and implement best practices to protect ground and surface water.	Conservation Commission	Ongoing	Unknown	Town budget	
Action Item #5 – Collaborate with agencies such as NHDES, Piscataqua Region Estuaries Partnership (PREP), Rockingham Planning Commission, and Exeter Squamscott River Local Advisory Committee to enhance regional collaboration among Fremont and Exeter River Watershed communities.	Planning Board, Conservation Commission	Ongoing	Unknown	Unknown	
Action Item #6 – Work with the ESRLAC to implement goals and recommendations from the Exeter River Management Plan.	Conservation Commission	Ongoing	Unknown	Unknown	
Action Item #7 – Periodically review the town’s regulations to ensure adequate erosion prevention, sediment control and stormwater management standards for all new development and update as necessary in conjunction with the Southeast Watershed Alliance’s guidance for stormwater standards in coastal watershed communities.	Planning board	Ongoing	Unknown	RPC Dues	
Action Item #8 – Improve awareness to land use boards on wetlands impacts from development through the comment process involved in granting special exceptions for wetlands disturbances.	Conservation Commission	Ongoing	Unknown	Unknown	

Fremont Master Plan – Table 1: Natural Resources Chapter Implementation Plan

Action Item #9 – Provide education and outreach to landowners on the effects fertilizer can have on water quality and wetlands ecosystems. Update and distribute Fremont’s water resources handout to all new residents.	Conservation Commission	Annually	Unknown	Unknown	
Recommendation 2- Continue to preserve and maintain the town’s open spaces and forests. Increase the quantity of conservation land in town.					
	Responsible Party	Timeframe	Cost (if known)	Funding Source	Progress, Year:
Action Item #1- Review data and recommendations from Fremont’s Open Space plan and Natural Resources Inventory and incorporate into town regulations where applicable.	Planning Board	1-3 years	Unknown	Unknown	
Action Item #2 – Educate Fremont residents of the benefits of preserving open space and landowners on best management practices for their properties. Identify landowners willing to conserve their land in perpetuity.	Conservation Commission	Ongoing	Unknown	Town budget	
Action Item #3 – Continue to work with and support the Conservation Commission and the Open Space Committee in identifying future conservation areas, seeking opportunities to expand existing conservation areas, and maintaining existing open spaces and town forests.	Select board	Ongoing	No cost	Unknown	
Action Item #4 – Review town regulations related to agriculture and update as needed to ensure support for agricultural operations in town.	Planning Board, Conservation Commission	1-3 years	Unknown	Planning Board budget, staff time, RPC dues	
Action Item #5 – Evaluate creating a local agricultural commission to promote strategies for protecting and promoting agricultural operations in town.	Conservation Commission, Select Board	Unknown	Unknown	Unknown	
Recommendation 3 – Protect wildlife and wildlife habitats in town from the impacts of development.					
	Responsible Party	Timeframe	Cost (if known)	Funding Source	Progress, Year:

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Action Item #1: Partner with UNH Cooperative Extension and NHDES to provide education and programming to residents on wildlife habitats in Fremont, including how to identify and manage invasive species.	Conservation Commission	Ongoing	Unknown	Unknown	
Action Item #2: Use data from the NH Wildlife Action Plan (WAP) and TNC's Connect the Coast to identify significant areas of wildlife habitats and corridors in town. Encourage the use of WAP maps by local land use boards when considering site plan and subdivision applications.	Planning Board, Conservation Commission	Unknown	Unknown	Unknown	
Action Item #3: Require developers to indicate areas of significant wildlife habitat in site plan and subdivision applications using data from NH WAP and Connect the Coast as well as input from the Conservation Commission.	Planning Board	Unknown	Unknown	Unknown	
Action Item #4: Evaluate establishing a wildlife conservation district to minimize habitat fragmentation from development in areas designated as highest ranked habitat according to the NH Wildlife Action Plan.	Planning Board	1-3 years	Unknown	Unknown	
Recommendation 4 – Protect the community and its natural resources from climate change impacts including but not limited to increased flooding, droughts, and extreme temperatures.					
	Responsible Party	Timeframe	Cost (if known)	Funding Source	Progress, Year:
Action Item #1: Inventory areas and infrastructure in town that may be particularly susceptible to damage from increased flooding and prioritize those areas for protection and upgrades (if infrastructure-related).	Conservation Commission, Land use department	Unknown	Unknown	Town Budget, RPC dues	
Action Item #2: Continue to discourage development in floodplains and special flood hazard areas. Review the town's floodplain development ordinance and amend as needed with updated FEMA flood data.	Planning Board, RPC	Ongoing	No cost	NA	
Action Item #3: Improve awareness of risks associated with climate change including mitigation measures for storm and drought events, especially among home and landowners in high-risk areas. Utilize the goals and recommendations in the town's hazard mitigation plan.	Emergency Management Dept., Land use Admin	1-3 years, ongoing	Unknown	Unknown	
<i>The following goals are derived from the Fremont Natural Resource Inventory to be reviewed by the Planning Board in conjunction with the Master Plan goals and recommendations.</i>					
Land Conservation					
1. Update the open space plan for undeveloped land in Fremont, incorporating the recommendations from the Land Conservation Plan for New Hampshire's Coastal Watersheds and the NH Fish and Game Wildlife Action Plan.					

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2. Continue pursuing the protection of 25% of undeveloped land.
3. Improve communication and outreach to surrounding communities to increase connectivity of conserved land.
4. Integrate ecological integrity and wildlife habitat into all aspects of town planning, including zoning and land use regulations and site plan review.
5. Recommend connections between wetland complexes and unfragmented blocks in Fremont and surrounding communities.
6. Update the Funding Summary and Future Funding Projections from the Fremont CTAP Open Space Report annually to ensure availability of future funds and open space preservation regulations are in-line with Town conservation goals.
Wetlands
1. Strengthen local land use regulations to increase protection around wetlands, including vegetative buffers around wetlands, by adopting best management practices where/if appropriate.
2. Improve enforcement of existing wetland protection regulations.
3. Strengthen wetland zoning regulations to reduce the number of special exceptions and variances that are being granted.
4. Protect wetland “clusters” by carefully reviewing future projects occurring in adjacent uplands and requiring conditions of subdivision or site plan approval for wetland protection to state on the plan and each deed “no further alteration of wetland areas permitted”. A wetland cluster may be connected wetlands or several wetlands that are adjacent to each other.
5. Protect the Exeter and Piscassic River and Spruce Swamp watersheds and prevent stormwater runoff from harming this area.
6. Conduct a hydrology study for the drainage of Spruce Swamp watershed.
River and Stream Corridors
1. Preserve and restore riparian buffers along river corridors.
2. Ensure enforcement of RSA 483-B, Shoreland Water Quality Protection Act https://www.des.nh.gov/organization/divisions/water/wetlands/cspa/index.htm
3. Ensure enforcement of RSA 483, the Rivers Management Protection Act, which established the NH Rivers Management and Protection Program https://www.des.nh.gov/organization/divisions/water/wmb/rivers/
4. Identify and implement best management practices for managing storm water runoff.
Drinking water supply and groundwater:
1. Protect water resources to protect future drinking water supply.
2. Ensure strict enforcement of septic system design to prevent future septic failures.
3. Restrict chemical pesticide and herbicide use.
4. Educate residents about stormwater management.

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Wildlife Habitat
1. Ensure developers work with the Planning Board to be aware of all possible consequences that may occur as a result of change to land cover.
2. Minimize the effect of development on the ecosystem by developing a conservation district to protect water quality and wildlife habitat.
3. Maintain a wildlife inventory baseline in Town Forest areas for the purpose of monitoring change over time.
Natural Communities
1. Protect natural communities identified in the NH Fish and Game Wildlife Action Plan and the Land Conservation Plan for New Hampshire's Coastal Watersheds.
2. Document invasive species within Fremont
Soil Conservation
1. Ensure construction sites utilize best management practices to minimize soil erosion and sedimentation. https://www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-03-42.pdf
2. Regulate building construction on slopes to minimize soil erosion and stormwater runoff.
3. Encourage parking lot design that minimizes unfiltered runoff.
4. Encourage use of cover crops to protect against soil erosion.
Scenic Resources
1. Identify and protect scenic views.
2. Develop a landscaping ordinance, especially for businesses and in the village district, to reduce stormwater runoff and protect the character and scenic beauty of Fremont.
Public outreach and education
1. Instruct the public regarding how to protect vernal pools.
2. Organize yearly cleanup efforts of the Town Forests.
3. Sponsor yearly/periodic walks through the forest to enable residents and interested citizens to learn about Spruce Swamp and the Town Forests.
4. Sponsor events to educate residents about septic tank maintenance.
5. Educate residents about stormwater management and the harmful impacts of chemical pesticides and storm water runoff on our surface water and drinking water supply
Climate change
1. Fremont is a small Town with limited resources, however there are things that can be done to manage climate change.
2. Have at least one activity per year, perhaps in conjunction with the energy group, to educate people about <i>Climate C1. hange</i> in Fremont and the impact that energy used efficiently and from alternative sources, such as solar, can have on the environment.

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3.	Give incentives to developers for using energy efficient construction minimizing the amount of fossil fuels needed in the household. Continue using incentives for building conservation subdivisions. Conservation subdivisions help to prevent sprawl (lot sizes are large, leaving very little undeveloped land). Conservation subdivisions can help maintain established wildlife corridors for animals.
4.	Map hazard areas and hazards (flood, floodplain) with at risk-structures and develop an inventory of public buildings and infrastructure that may be at risk.
5.	Review land use ordinances to insure protection of health and safety of residents from climate change impacts.
6.	Encourage development outside of the 500 year floodplain.
Wildlife Corridors:	
1.	Incorporate 'connect the coast priorities' into Fremont land use planning documents. (see map 15 and the report: https://ecologicalconnectivity.com/sites/default/files/project_files/nh-connect-the-coast-report.pdf)
2.	Give priority to road and stream crossing intersection projects to provide connectivity benefits for both aquatic and land animals.
3.	Seek funding to ensure high quality project results that improve wildlife corridors.
4.	Consider wildlife corridor connections when evaluating potential conservation properties.
Invasive Species	
1.	Hire a professional to complete an inventory of invasive species on Town-owned properties and to develop and implement a long-term plan to control them.
2.	Continue to educate the public regarding the importance of controlling and eliminating invasive species and how to do so. Include outdoor demonstrations to enable the public to recognize the invasive species.