Analysis of the Conservation Strategy and Management of Public Lands in Amherst, NH.

A Wildlife, Habitat Management,

and Public Recreation Perspective.

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1. BACKGROUND

Mission of the Amherst Conservation Commission

To protect and manage the biodiversity and natural resources of Amherst, NH and to promote the public use of natural open space for outdoor recreation.

Goal of this Report

The goal of this brief report is to evaluate and provide suggestions concerning current and planned management of public conservation land in Amherst. It focuses on town-wide ecosystem-level management along with property-specific conservation strategies and wildlife interventions that aim to support wildlife, habitat management, and recreational viewing opportunities for the public. It is hoped this analysis will contribute to the Amherst Conservation Commission (ACC) Strategic Plan 2025-2035 currently in development.

Public Land in Amherst

The ACC is currently responsible for management of 3,059 acres of conservation land which comprises about 14% of the total town area (Figure 1). Key properties include Joe English, Hazeltine, and Betty Arnold Forest which are particularly rich in trails and recreational opportunities. Additionally, Pond Parish is an area of extensive wetlands and the Buck Meadow Conservation Area is a prime site for educational opportunities with an abutting recreation complex and an impressive recent conversion of a former golf course to native grassland. Other conservation land not owned by the town add an additional 1,104 acres. Notable examples include NH Audubon's Ponemah Bog Wildlife Sanctuary and Patch Hill Conservation Area owned by the Society for the Protection of NH Forests. The New Boston Space Force Station owned by the US Department of Defense contributes to an extensive, relatively unfragmented, block of undeveloped land in the north of town.

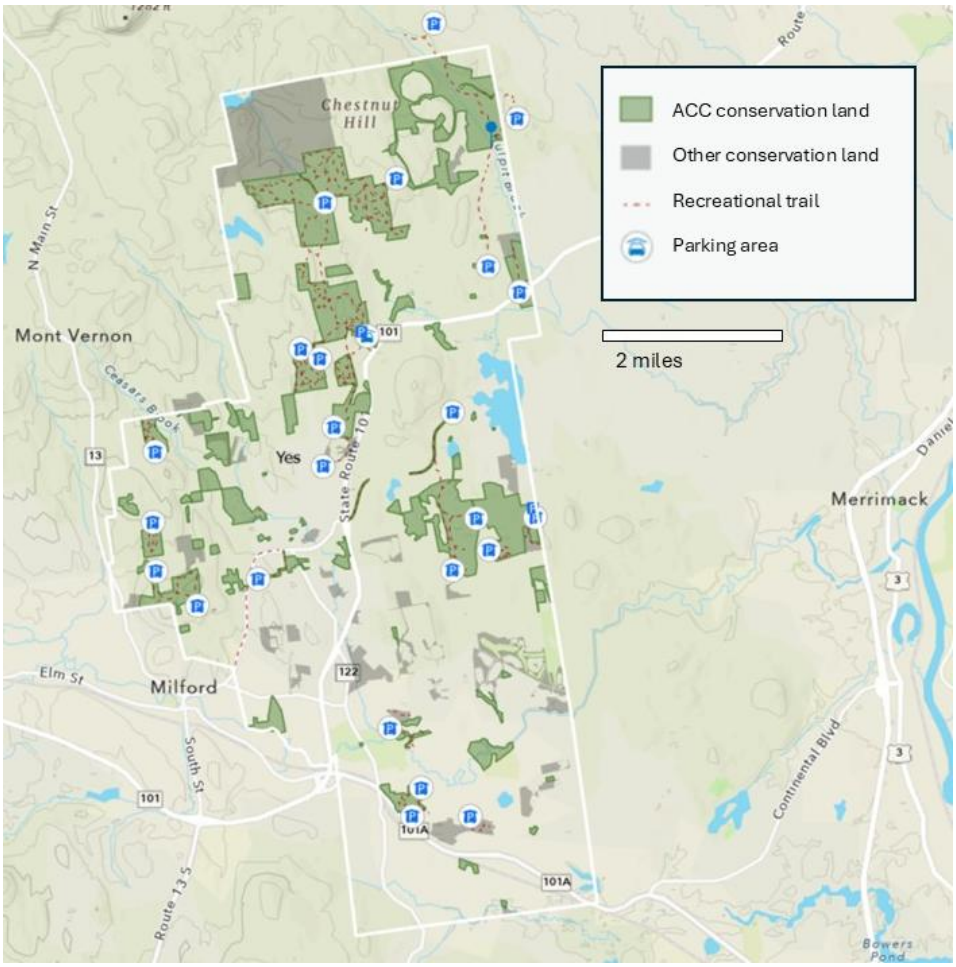


Figure 1. Conservation land and recreational access opportunities in Amherst. Together ACC properties and other conservation land comprise about 19% of the total town area.

Key Planning Documents

Conservation Plan for Amherst, New Hampshire 2019

The purpose of the Amherst Conservation Plan is to provide the Conservation Commission and other town officials with a science-driven and consensus-based approach to fulfilling ACC's mission. The plan integrates the best available information with expert judgment. Conservation priorities include town-wide consideration of hydrology, rural values, trail connectivity and conservation lands. Strategies for conservation include;

1. Influence zoning, planning and zoning adjustments
2. Acquire (and protect) property and development rights where appropriate for conservation
3. Manage town forests
4. Manage town grasslands
5. Control invasive species
6. Promote low-impact outdoor recreation
7. Educate citizens about Amherst's biodiversity and natural resources.

Forest Management Plan Town of Amherst, NH 2020-2040

The ACC is responsible for management of Amherst's town forests and forested conservation lands which are comprised of 11 major areas totaling just over 3,000 acres. Management of these areas aims to conserve native biodiversity, generate revenue, and maintain or improve recreational access, natural aesthetics, and wildlife viewing opportunities. The Forest Management Plan, and accompanying GIS database, overviews planned forest management, invasive species control, and monitoring and adaptive management in these areas.

2. LAND PROTECTION

Land conservation is the most impactful thing to be done not just for wildlife, but also drinking water protection, agricultural and forest production, and many residents' quality of life. Amherst has a high competence in land protection with a robust check list of acquisition criteria, including a formalized list of reasons to disqualify potential tracts. It is one of the few communities in New Hampshire that conducts land transactions from start to finish without support from a Land Trust or other seasoned conservation agency.

A high proportion of currently protected parcels represent high quality wildlife habitat. Fifty two of sixty seven (78%) ACC properties overlap with areas designated as the highest ranked wildlife habitat in the state, in the biological region, or as a supporting landscape in the Wildlife Action Plan (WAP). ACC conservation land also shows a lot of spatial overlap with Conservation Focus Areas of the Merrimack Conservation Plan. This regional multi-partner, science-driven, consensus based land conservation plan created priority areas for protection throughout the watershed based on wildlife habitat, water resources, public recreation opportunities, and agriculture and forest resources. The recently released Souhegan River Corridor Management Plan includes a recommendation to establish land acquisition programs to identify and acquire potential conservation land.

A 2022 build out analysis in Amherst's Master Plan shows there are currently only 185 undeveloped parcels 10 acres in size or more and predicts there will be just 87 with a full buildout base. Analyzing existing land use data to identify undeveloped agricultural, recreation, or vacant lot areas shows there are very few opportunities remaining to protect important areas for wildlife and the time remaining for additional land conservation is likely limited. This means land protection is an important place to prioritize efforts during the 10 year duration of the conservation commission's strategic plan update.

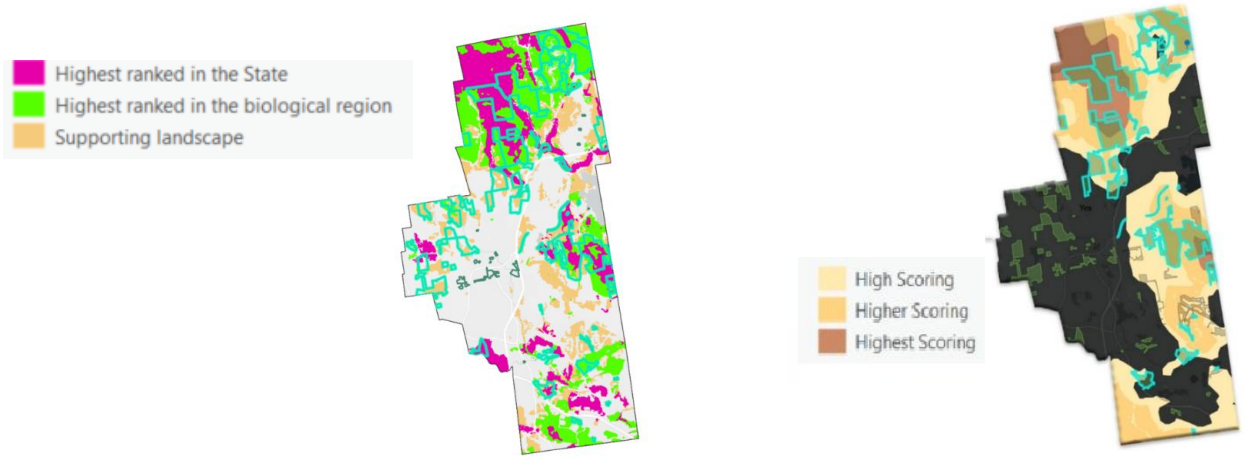
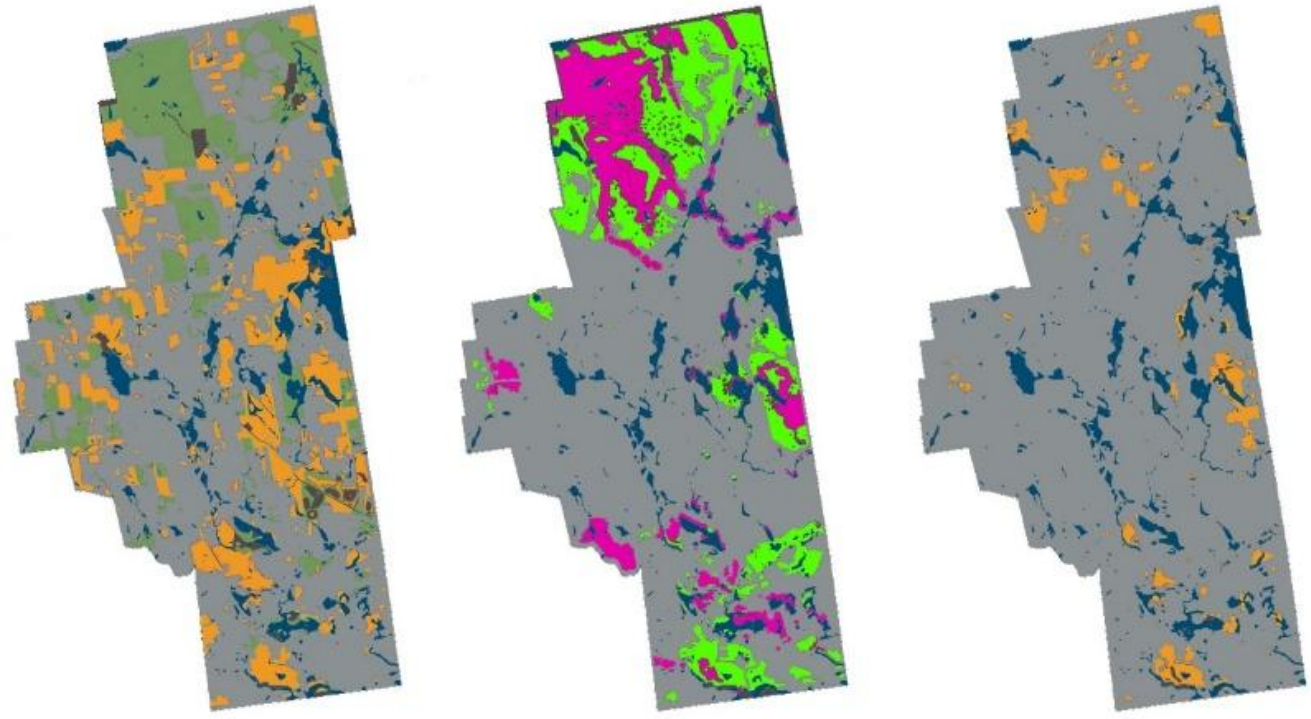


Figure 2. A large proportion of ACC conservation lands overlap with priority areas of the Wildlife Action Plan and the Merrimack Conservation Plan, a watershed wide regional land protection plan. Properties that overlap with high scoring areas in each are highlighted in turquoise.

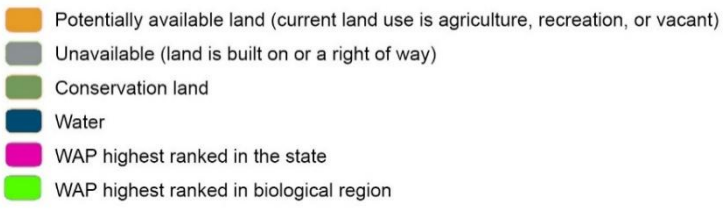


Potential conservation land.

WAP high value habitat

Potential conservation land of high wildlife value.

Figure 3. Potential conservation land of high wildlife habitat value according to the NH Wildlife Action Plan. Potential conservation land is identified using agricultural, recreation or vacant lots as a case study only.



Potential Future Opportunities and Considerations for the ACC Strategic Plan

- Continue to look for opportunities with willing landowners to protect already identified priority areas for conservation.
- Consider exploring outreach opportunities to inform community members of the importance of land protection, its value to wildlife, and resident's quality of life, with the goal of making connections with additional landowners who may be interested in protecting their property.
- Consider incorporating opportunities for wildlife connectivity into criteria for land protection.
- Explore opportunities for the Department of Defense's Readiness and Environmental Protection Integration (REPI) Program to support the acquisition of land located close to New Boston Space Force Station.

3. WILDLIFE HABITAT

Amherst in Context

Amherst lies within the Hillsboro Inland Hills and Plains and the Gulf of Maine Coastal Plain ecoregions. The 2025 WAP maps 14 habitats in town, with the majority of the unbuilt area classified as Appalachian oak-pine (6,702 acres) or Hemlock-hardwood-pine (4,206 acres) forest.

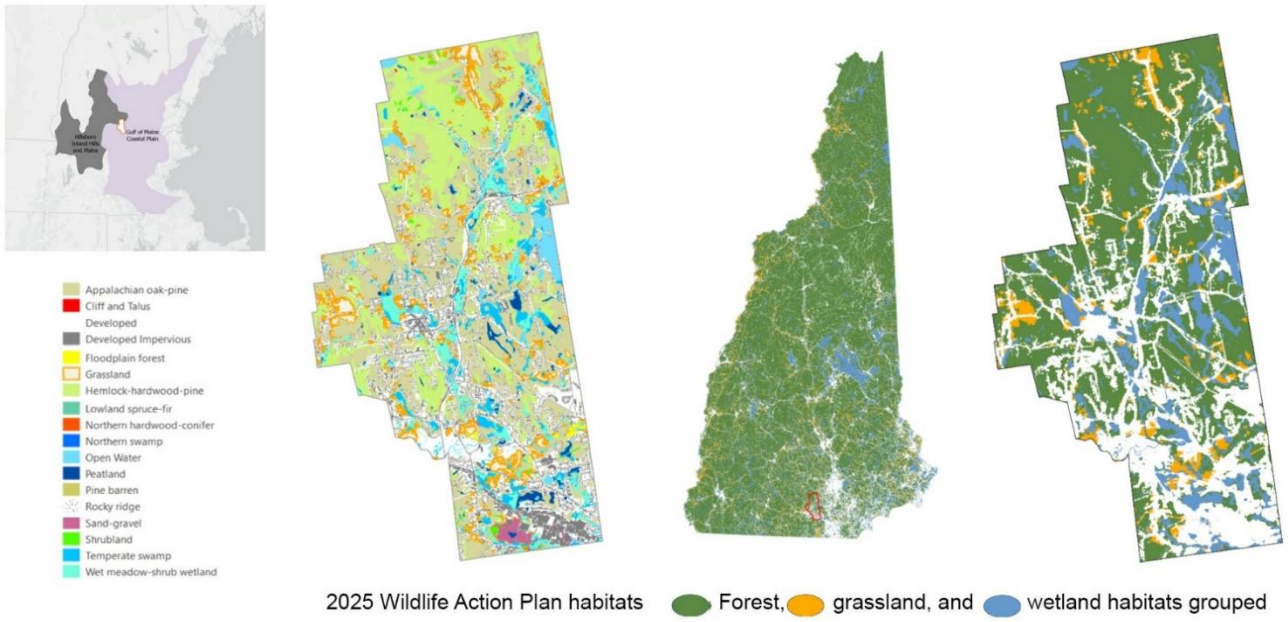


Figure 4. 2025 WAP land cover maps for Amherst with total acreage by habitat shown in the table below.

2025 WAP habitat	Amherst	
	Acres	%
Appalachian oak-pine	6,702	30.43
Cliff and Talus	1	0.00
Developed	4,194	19.04
Developed Impervious	2,423	11.00
Floodplain forest	61	0.28
Grassland	1,063	4.83
Hemlock-hardwood-pine	4,206	19.10

Open Water	759	3.45
Peatland	295	1.34
Rocky ridge	12	0.05
Sand-gravel	138	0.63
Shrubland	103	0.47
Temperate swamp	1,065	4.84
Wet meadow-shrub wetland	1,002	4.55
Total	22,024	100

A Focus on Habitats

Forest

The most extensive habitat in town is forest, specifically Appalachian oak-pine and hemlock-hardwood-pine. Species of greatest conservation need (SGCN) associated with this type of forest include the northern goshawk, wood thrush, and scarlet tanager.

Young forest habitat is important for many wildlife species. In the northeast the populations of at least 89 birds, mammals, and reptiles have fallen significantly over the past century because of a decline in this habitat. One of the goals of the current forest management plan is to increase young forest habitat while at the same time regenerate valuable timber species. Two timber harvesting practices currently being used on ACC lands to meet these goals are group selection, and shelterwood harvests. Other silvicultural practices on ACC lands include improvement cuts, crown thinning, and salvage cuts.

A high deer density means forest response to timber harvesting is not what is typically seen in areas with more normal browse pressure. After a timber harvest deer eat several tree species preferred by wildlife such as red oak and hickory as they regenerate but do not like to eat black birch so this species often dominates regrowth, especially in small group cuts.

Black birch regeneration in a group cut on the Hazeltine property

Under the group selection system, openings typically range from 0.25 acres to 2 acres in size. Creating larger forest openings and leaving dense slash on the ground, which is challenging to walk through, is likely to deter deer and allow mixed tree species regrowth, at least at the center furthest from the mature forest edge. Using only the tops of harvested trees makes it particularly hard for deer to travel through and still allows light to reach the forest floor and so new seedlings to establish. Another way to deter deer browse in newly harvested areas is to create slash walls (Appendix C). The USDA Natural Resource Conservation Service recommends creating these 8 feet tall and 10 feet wide throughout and UNH Cooperative Extension says they are most effective when built roughly 10 feet tall and 20 feet wide. Larger harvested areas attract more species of early successional bird. Common yellowthroats, chestnut-sided warblers and mourning warblers prefer larger openings but can breed in openings as small as 0.3 acres. However, most young-forest birds are uncommon in openings less than 2 acres in size. To add to the complexity, forest openings more than about an acre in size do not encourage oak regrowth as they provide more sunlight and allow faster growing tree species to out compete oak.

Due to the challenges of creating young forest habitat and regenerating valuable tree species in an area of high deer density, an alternative strategy could be selective thinning. Removing individual trees allows more sunlight

to reach established mast (seed, nut and fruit) producing tree species such as oak, hickory, and black cherry and would allow them to grow faster and produce larger crops of mast.

Creating traditional shelterwoods with large mature mast producing trees left standing is an option for regenerating oak and providing an early successional component at the same time. Again, a heavy slash component is necessary to deter deer. Traditional shelterwoods provide more shade to help with oak regeneration as well as a seed source to enhance the regeneration of preferred tree species.

Balancing the creation of young forest habitat with leaving large unfragmented blocks of mature forest is also very important, particularly for species such as the northern goshawk.

Newly arriving diseases and forest pests such as hemlock wooly adelgid and emerald ash borer are changing forest dynamics so traditional forest species composition and response to harvest is in flux. Beech Leaf Disease (BLD), was first documented in Amherst in 2024 and now is prevalent in the area. There is no viable option for treatment of BLD at this time. Focusing on maintaining established mature mast trees as a new forest composition becomes established is important. Amherst Conservation Commission has been documenting forest regrowth in areas of harvest and will decide in the next few years how to proceed with managing early successional habitat in forested areas in town.

Potential Future Opportunities and Considerations for the ACC Strategic Plan

- Minimize group cuts and focus on selective thinning in hardwood areas to promote growth of established mast trees that are too big for deer to browse.
- Consider creating a larger harvest area, around 10 acres, and leave lots of slash using the tops of trees only.
- Consider creating large slash walls to prevent deer access to newly harvested areas.
- Consider limiting silvicultural operations to none or single tree thinning in the northern part of town close to the New Boston Space Force Station to provide as large a block of mature forest as possible in this already established mainly contiguous area of protected land.
- Continue to follow the voluntary best management practices recommended in Good Forestry in the Granite State and consider updates in the new third edition.

Grassland and Shrubland

Grasslands are important to many species of wildlife including the SGCN species bobolink, eastern meadowlark, and American kestrel. Of all ACC's properties, only seven support fields more than 10 acres in size which is the minimum area recommended to support nesting bobolinks. The largest grassland area on town land is 39 acres located at Lindabury Orchard. Massachusetts Audubon has written a great guide for Best Management Practices for Grassland Birds. The ACC already engages in the most important of these; delayed mowing and cutting only part of a field on a rotational basis. Although not managed directly by the ACC, Figure 6 illustrates there are several opportunities to coordinate grassland management with other land owners both in Amherst and surrounding towns, particularly in the areas of Joppa Hill Farm, Lindabury Orchard, and Buck Meadow Conservation and Recreation Area.

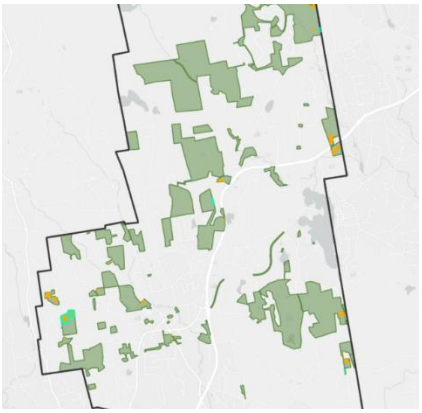


Figure 5. Grasslands, shown in orange comprise 317 acres of ACC land according to the 2025 WAP. Those highlighted in turquoise are over 10 acres in size.

Working farms may choose to incorporate wildlife friendly low, or no, cost techniques if interested including the practices of not using neonicotinoids, leaving pollinator strips between agricultural plots or at field edges, or leaving standing corn after harvest for waterfowl to eat.

Particularly in grassland, but also in some shrub and forested areas, there are many opportunities for turtles to nest as there is quite a lot of sandy soil due to the current and past influence of the Souhegan River. If the ACC decides to create additional turtle nesting sites, it is very important to locate them away from development as associated urban wildlife such as skunks and racoons frequently predate nests, especially soon after they are laid, making these areas population sinks. Artificially created nesting areas will also be more likely to be used if located in sunny areas close to wetlands.

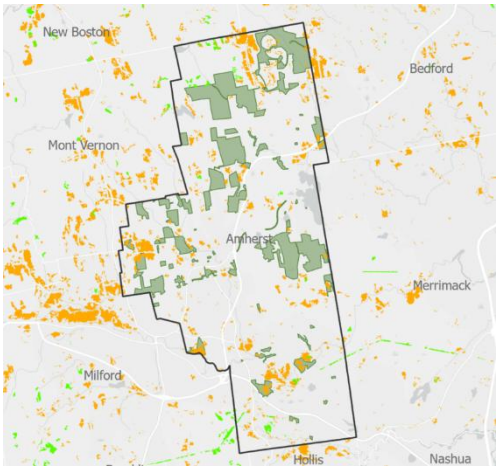


Figure 6. Grasslands in Amherst and surrounding towns.

In addition to maximizing the areas of grassland and shrubland, there are opportunities to create pollinator plots. Though visually attractive and important to several insect species, pollinator gardens require more maintenance than grass and shrubland habitat so starting with a few small, manageable areas in locations where they are most likely to be maintained is important. UNH has developed a fact sheet about pollinator gardens including a flowering calendar and color chart for perennial wildflowers to help with garden design.

The 2025 WAP update contains a shrub landcover category that was not identified in 2020 and contributes to our understanding of early successional habitats. Shrublands are important to many species of wildlife including American bittern, woodcock, hognose snakes, the New England cottontail, and eastern towhee. The NH Audubon State of the Birds report notes that of the 43 species of birds that breed in NH shrublands, two thirds are declining.

Potential Future Opportunities and Considerations for the ACC Strategic Plan

- Continue the practice of delayed and rotational mowing to avoid impacts to grassland nesting birds. Mowing after October can also reduce impacts to monarchs.
- Potentially expand the acreage of milkweed supported in grassland areas. This is especially important to consider in areas where only a few plants exist as sometimes caterpillars can hatch and not have enough plant material to eat.
- Explore the possibility of establishing pollinator plots in areas where they provide education value and are located where people may be willing to help maintain them. Potential areas include the Scott land near Souhegan High School, Buck Meadows near condominiums and a town recreational area, the Alice Townes property near the elementary school, and Joppa Hill close to the educational farm.
- Create a model to map the most viable areas for potentially creating turtle nesting sites away from development and associated urban wildlife. Turtle nests located close to development are highly subject to predation and consequently these sites can be a population sink.
- Encourage dog owners to leash their pets during nesting season, 15 March to July 15. This has value in all habitats but particularly grassland areas as prey species can be seen from a further distance away.
- Adding appropriately sized nest boxes in grassland habitat may attract bluebirds or kestrels. If located close to a wetland, tree swallows may use nest boxes too.
- Reach out to farmers in town with hay fields 20 acres or more to let them know about The Boblink Project which provides economic assistance to delay mowing on fields 20 acres or more and to raise awareness of other wildlife-friendly farming practices.

- Consider managing portions of conservation land as shrubland habitat. Although requiring episodic management to prevent forest succession, these habitats support several declining species in the state and only 107 acres exist in town according to 2025 WAP landcover data.

Wetlands

Wetlands are important to many species of wildlife including the SGCN species pied-billed grebe, sora, and least bittern. Spotted, blue-spotted and Jefferson's salamander as well as wood frogs breed exclusively in vernal pools. Beaver created wetlands are important to wildlife even after abandonment as they provide important habitat for other species at different wetland successional stages (Figure 7).

By far the majority of wetlands in Amherst are forest/shrub wetlands according to the US Fish and Wildlife Service's National Wetland Inventory (Figure 8). They extend over 1,300 acres and represent 548 of the total 1,210 acres of wetland on ACC land.

Amherst has a town ordinance that protects wetland buffers. The ordinance classifies wetlands using The Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire (NH Method), a well-established and respected protocol. Water protection buffers have a distance of 100 feet wide, significant wetlands 50 feet, and other wetlands have 25 foot buffers associated with them. Vernal pools are evaluated to be Tier 1 with 100 foot buffers, or Tier 2 with 50 foot buffers. The Souhegan River Corridor Management Plan includes multiple recommendations to help protect water quality including a recommendation to increase wetland buffers to at least 50 feet for structures and to establish a no cut buffer so Amherst is already aligned with this in most wet areas.

Potential Future Opportunities and Considerations for the ACC Strategic Plan

- Develop a town-wide wetland plan, similar to the Forest Management Plan, to consider wetland successional stages and beaver management including beaver abandonment of wetlands. Include a field assessment of wetlands on ACC lands. This could allow the planning of potential timber harvests to encourage growth of aspen and other tree species that beaver like to eat in targeted areas if needed.

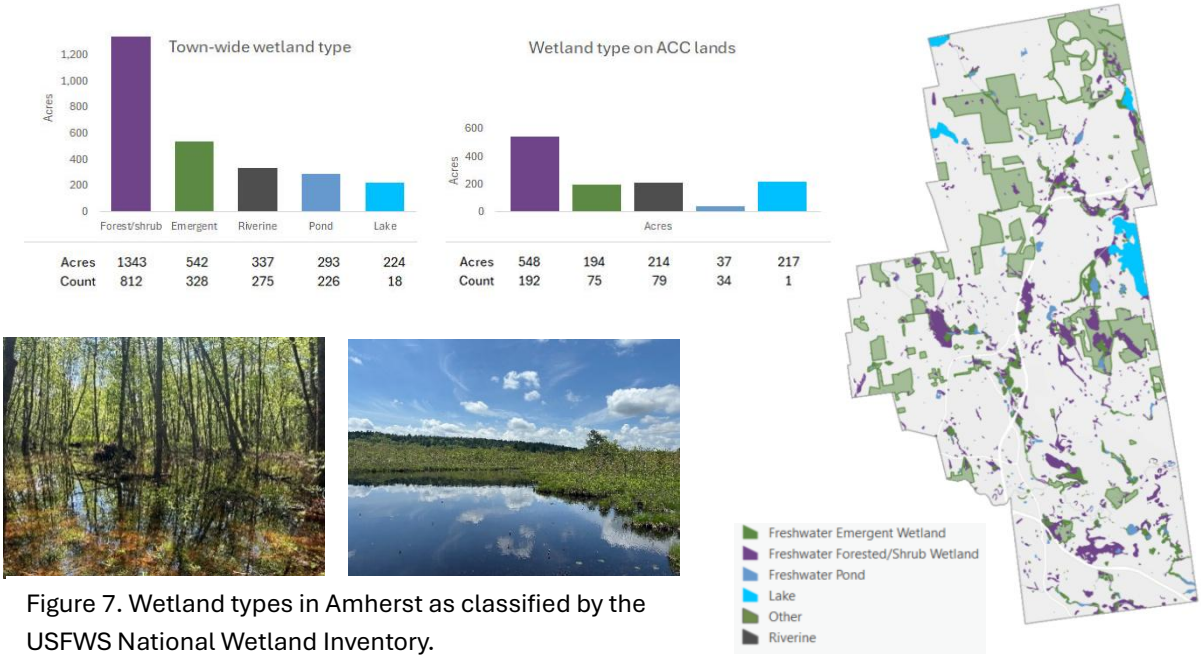
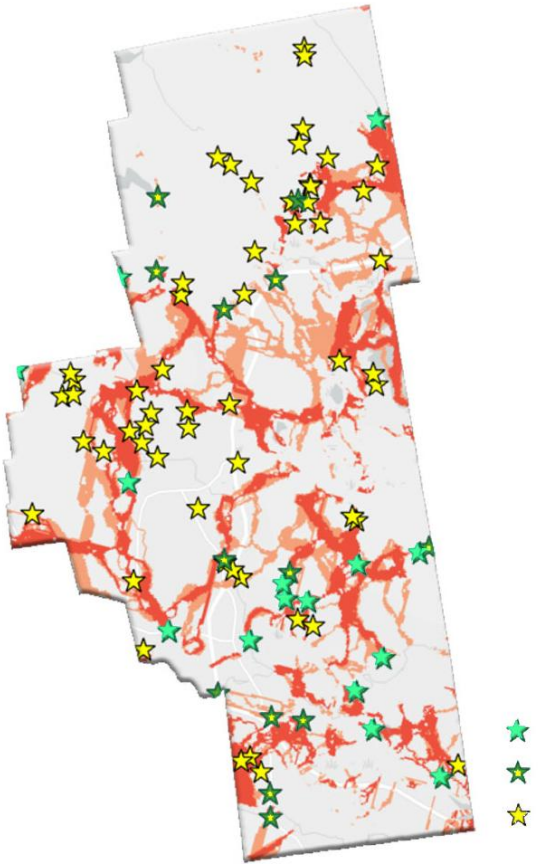


Figure 7. Wetland types in Amherst as classified by the USFWS National Wetland Inventory.

Habitat Management in a Changing Climate

A wildlife corridor is a habitat linkage that joins two or more areas, allowing for movement of wildlife from one to another. Connectivity allows for wildlife to travel across the landscape. This is particularly important in a changing climate that may result in species range shifts, and also allows for gene flow between populations. Two key mechanisms to enhance the connectivity of wildlife corridors are land protection and the installation of culverts and road-crossings that enhance wildlife passage. A University of Vermont study showed that amphibian mortality drops over 80% where wildlife underpasses are present.



Perched culverts are a common barrier to aquatic animal movement. The NH Stream Crossing Initiative is a multi-agency group that collaboratively works to align resources and improve management of stream crossing infrastructure across the state.

Potential Future Opportunities and Considerations for the ACC Strategic Plan

- Consider funding the inclusion of wildlife passage structures in engineering designs in priority wildlife corridor areas when the DPW plans to renovate or replace them.

Figure 8. Culverts designated as "compromised" via field inspection in key areas of wildlife connectivity. Adding wildlife friendly on crossing measures on DPW schedule

4. WILDLIFE

Key wildlife species shaping the town landscape and habitats are deer and beaver. The large deer population is causing browse pressure that is influencing the outcomes of traditional silvicultural practices. Due to trapping, beaver were virtually extirpated from NH by the late 1800s. Now the state is populated to carrying capacity with beaver creating important wetlands that support many other wildlife species including several rare and threatened species including pied-billed grebes and, spotted and Blanding's turtles.

Rare and threatened species are a focus of many conservation projects, including land protection and management. ACC lands support 11 different species as currently documented in the NH Natural Heritage Bureau's (NHNHB) database, the most frequently recorded of which is the Fowler's Toad (Appendix B).

Amherst is one of only 15 towns in New Hampshire where the New England Cottontail (NEC) is known to be present. It is associated with early successional woody habitat, particularly shrubland. Shrubby areas should be assessed for management on a ten year cycle and only part of an occupied site harvested at one time to give areas for the rabbits to move to. Dropping trees on the ground and building brush piles in early successional woody habitat can be helpful for providing cover. Although invasive plant species management is encouraged in most areas, leaving woody invasive shrubs is important in areas where NECs are known to be present is important. Multiflora rose is a particularly important species to leave in situ as, as well as providing cover, their thorns provide additional protection from predators and the bark of the stems is an source of food, particularly during winter snow cover. Looking to find opportunities to connect existing shrubland habitat to allow NEC movement is important to allow species survival and genetic diversity.

"Rocket" style bat boxes have been shown to be helpful even in sites where traditional bat boxes are already located. They are often occupied earlier in the season, then bats may more to the traditional style boxes later in the year. The cylindrical style also means bats can more to any orientation depending on ambient temperature conditions and sun exposure. This is important as bats are heterothermic animals, meaning their body temperature varies with the environment. It is good practice to clean bat boxes each spring by using a long stick to knock debris, often old wasp nests.

Several bird nest boxes have been placed in wetlands and grassland habitats in town. It is important to maintain these boxes each spring by removing the prior year's nesting material to prevent transmission of parasites and potential disease. Adding predator guards is very important. Also placing a small piece of sheet metal around the entrance hole prevents small mammals gnawing and enlarging the opening and so keeps the boxes most likely to be used by the species it was originally intended for.

Bobolinks are a SGCN that usually require at least 10 acres of contiguous grassland to breed, although occasionally they have been found nesting in fields as small as two acres. Their population in NH has declined 2.4% annually since 1993. They breed in a variety of grassland types that usually have a mix of tall grasses and herbaceous flowering plants along with a dense litter layer. These conditions are generally associated with old fields so there are several areas of potential habitat in Amherst. Vesper sparrows are also dependent on large areas of grassland usually 15 acres or more. Their populations in NH have been declining 5.1% annually since 1966. They prefer grasslands with patches of bare ground and elevated perch sites. This is one example of why a variety of grasslands with different microhabitats is important.

The monarch watch program has multiple ways that citizens can support this species including creating a monarch waystation, participating in a large scale mark and recapture program, or rearing monarchs at home or in the classroom. Please see the grassland section for further comments about monarch habitat and creating artificial turtle nesting areas away from houses and potential predation from "urban wildlife".

Potential Future Opportunities and Considerations for the ACC Strategic Plan

- Look to recruit a core crew of volunteers with strong hepatological identification skills to conduct a town-wide survey for turtles with the goal of submitting sitings to the NH Natural Heritage Bureau database. Turtle locations will be included in the NH Natural Heritage database as "high confidence" if documented with a GPS location and photograph that allows identification. Late April into early May is the best time of year to do this as leaves do not obscure sighting newly emerged turtles basking in the spring sun
- Construct a limited number of nest boxes in grassland areas and close to wetland edges. Maintaining bird boxes by cleaning old nest material after the breeding season is important. Incorporate a long term stewardship plan into the construction of any new nest boxes in order to prevent unintended species taking them over. For example, house sparrows often take over boxes originally intended for blue birds. Tin Mountain

Conservation Center in Albany, NH has a corps of volunteers who clean nest boxes each spring and then monitor nesting success. Adding boxes to grassland areas is encouraged over wetlands. Incorporating predator guards and sheet metal guards around the entrance holes to stop gnawing is encouraged. Mass Audubon has a nest box sizing chart with dimensions appropriate to the species you are looking to attract.

- Continue ACC engagement in the planning of the rail trail in town in order to mitigate impacts to turtles, especially Blanding's and spotted. Explore whether underpasses are an option where the trail abuts key wetland areas.
- To encourage maternity colonies, and so recruitment to the population, place bat boxes facing south with as much sun exposure as possible. All boxes should be placed at least 12, and ideally 20 feet on a tree or structure and have no, or few, obstructions underneath. Adding the "rocket" style design to areas may provide additional roosting opportunities.
- Monitor bobolink nesting sites to document if the number of nests are increasing or declining each year.
- Consider participating in the Salamander Crossing Brigade annual event coordinated by the Harris Center for Conservation Education.

5. INVASIVE PLANT MANAGEMENT

The ACC works closely with the Department of Public Works who manages invasive plants in town right of ways. This relationship is key to preventing spread of invasives throughout town and is a model for community natural resource management. A town-wide invasive plant strategy is in development by the Davey Resource Group and a strategically thought-out survey and documentation of the location of invasive plants and the effectiveness of any management is being spearheaded by the ACC. Locations of invasive plant stands are being mapped using EDDMapS, the Early Detection and Distribution Mapping System based out the University of Georgia, a platform that is recommended by the statewide guide to planning invasive plant management projects, Picking Our Battles. EDDMapS is monitored by the NH Department of Agriculture, Markets and Food's Invasive Plant Species Coordinator for newly invading plant species so contributing to this database has high value for natural resource focused decision making.

Potential Future Opportunities

- When the current mapping project is complete, develop a strategic management plan for invasive plant management based on spatial location and, also importantly, plant life history traits such as length of viable seed bank and mechanisms of spread. Strategic approaches are outlined in "Picking Our Battles" and include suggestions such as focusing on new invasive plant species coming into town, starting at the headwaters and working downstream, and dealing with small populations before they spread.
- Consider opportunities to increase community awareness and identification of Japanese stiltgrass. It can grow in dense stands that crowd out native species and is not browsed by deer or other grazing animals so can easily spread in grassland areas. It is not yet established in Amherst but has been documented in Merrimack so is an early detection species.
- Prioritize control of black swallowwort, especially in herbaceous areas. It is a member of the milkweed family so monarch butterflies can mistakenly lay their eggs on this plant and when they hatch the caterpillars have nothing to eat as black swallowwort is indigestible to them. This makes this plant a population sink for monarch butterflies.

6. PUBLIC RECREATION AND EDUCATION OPPORTUNTITIES

The NH Fish and Game publication Trails for People and Wildlife notes that, in New England, a trail's corridor of influence averages about 400 feet in each direction. The corridor of influence is the distance that our presence is detected on either side of a trail as we walk. Amherst has begun an evaluation of the trail system in town by rerouting some sections around field edges. There is still potential to consider rerouting, or even closing, some small sections of trail as significant increase in unfragmented habitat can be achieved in some areas by minor modifications to current trail network. If selected thoughtfully, any changes could still provide extensive public recreation opportunities while also creating larger blocks of unfragmented habitat allowing wildlife to nest and continue normal behavior further from potential predators and disturbance.

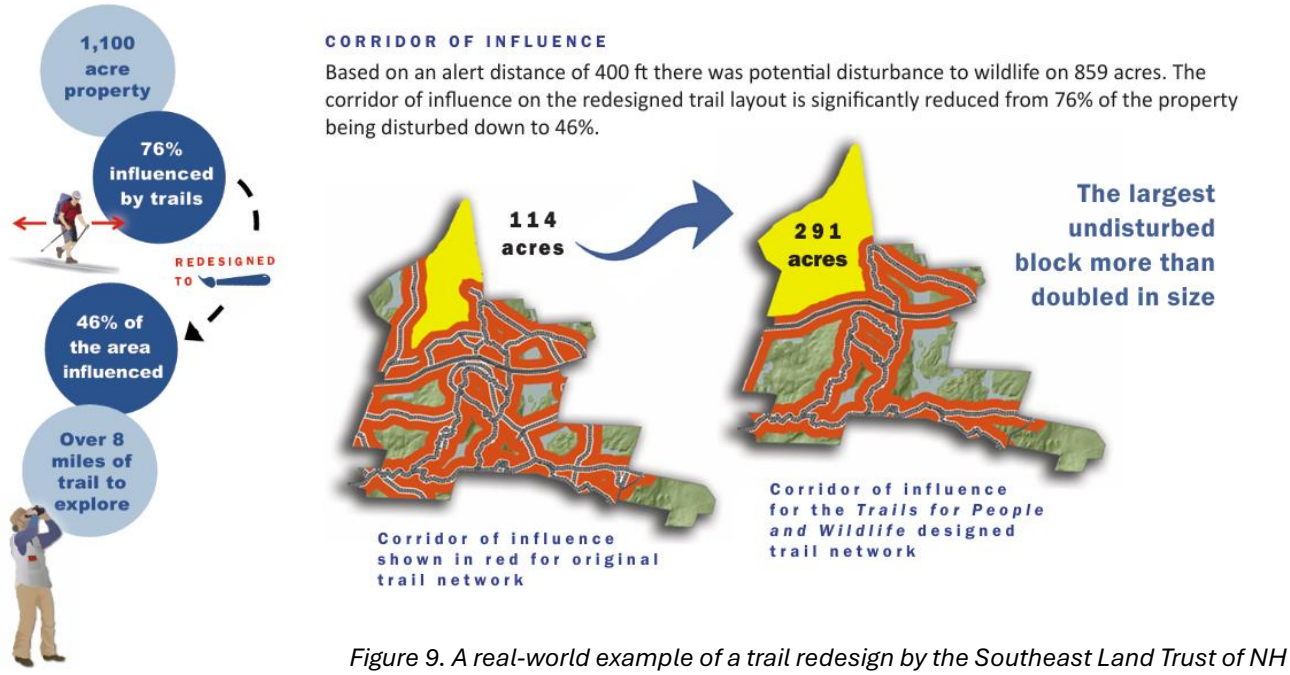


Figure 9. A real-world example of a trail redesign by the Southeast Land Trust of NH at the Harvey's Kennard Hill Forest in Epping.

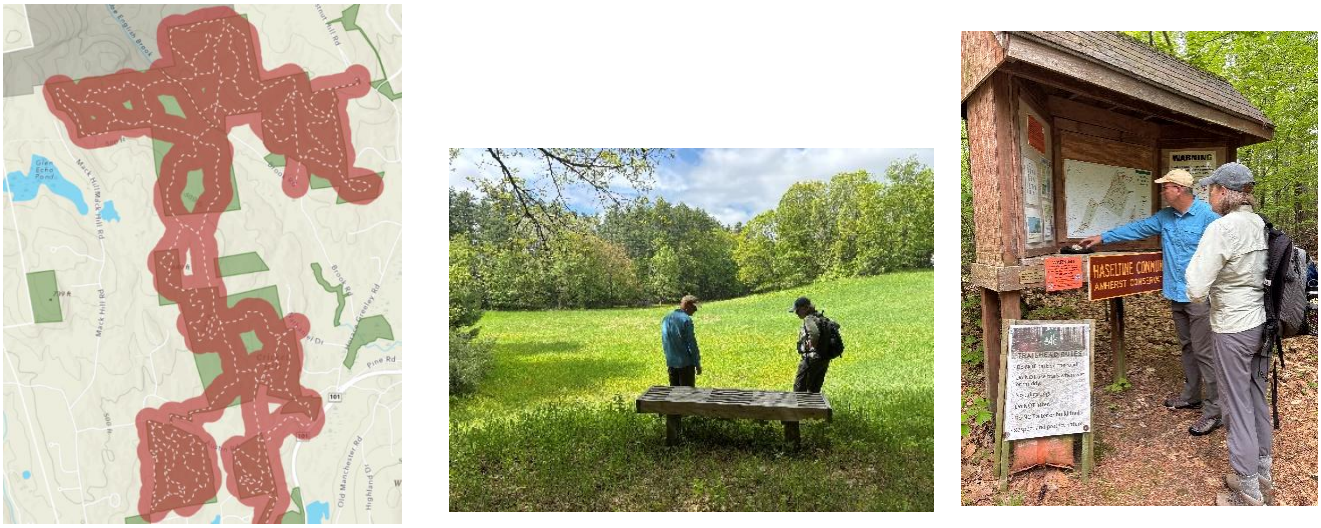


Figure 10. The corridor of influence applied to mapped trails on the Joe English, Betty Arnold Forest, Haseltine, and Dacquino Forest tracts.

Potential Future Opportunities and Considerations for the ACC Strategic Plan

- Evaluate the current network of trails on ACC lands to maximize public recreational enjoyment and quality of wildlife habitat. Consider decommissioning short sections of trail based on the Trails for People and Wildlife sensitivity model, trail configuration, amount of public use, and land form setting to maximize the area of unfragmented habitat available. This is particularly important to species such as the oven bird and which are ground nesting and so are highly sensitive to predation from edge habitat species.

7. PRIORITIZING MANAGEMENT ACTIONS

The value of site-specific management actions, such as building brush piles and installing nest boxes, usually depends on the location under consideration and the specific long-term management goals for that area. However, there are a few key strategies that have value wherever they are applied. The most important is land protection as this not only secures wildlife habitat from potential development, it also protects water quality and many other ecosystem services. Using criteria such as adding to existing tracts of conservation land, prioritizing rare habitats, and protecting identified wildlife corridors means parcels of the highest conservation and wildlife value are protected. Evaluating the spatial location of trails and considering small-scale closures or reroutings, can be a fairly easy way to increase the size of unfragmented blocks of habitat, allowing interior wildlife species such as the oven bird or bobolink to thrive while still getting people out to enjoy nature. Invasive species management can be of great ecological benefit as long as it is approached strategically. Amherst's current invasive plant mapping project is admirable and the fundamental step in developing such a strategy. Increasing public awareness of how to identify early detection species can increase the chances of rapid response and so the chance of preventing a new species getting a foothold in town. This is particularly important as climate changes and some species ranges shift in response. Across New Hampshire several early successional habitat species' populations are declining. Although these habitats are ephemeral and require periodic management to maintain their early successional status, it is an important action to take if we want to maintain associated wildlife species in an area. Human management of such areas is needed as some natural mechanisms of disturbance are rare, particularly fire due to suppression. Increasing connectivity and wildlife passage by protecting land and including measures that make road passage more-wildlife friendly in areas that have been identified as priority wildlife corridors increases safe wildlife movement and mixing of gene pools. Lastly, encouraging pets to be kept on leash during nesting season, 15 March to July 15, also has universal value, particularly in grassland areas.

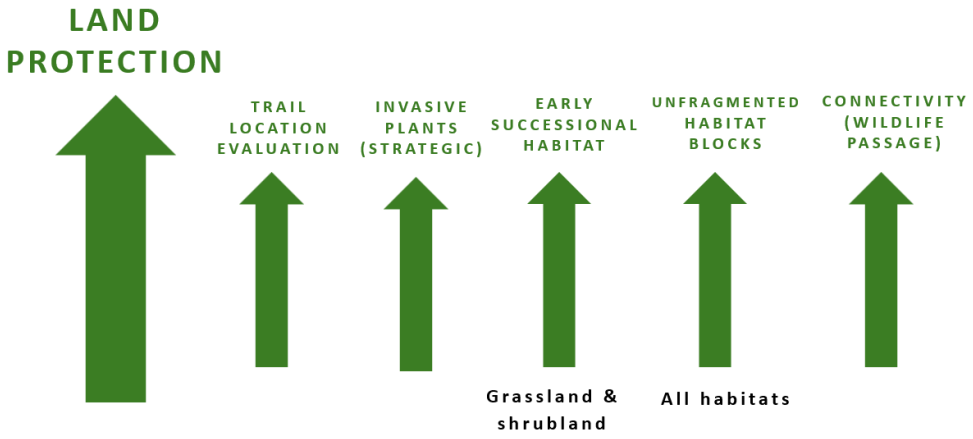


Figure 11. Key town-wide management actions that help protect wildlife and their habitats.

APPENDIX A: NH NATURAL HERITAGE RECORDS ON ACC PROPERTIES

PROPERTY	NAME	SCIENTIFIC NAME
Ackley	Spotted Turtle	Clemmys guttata
B&M Rail Bed (North Trail)	Spotted Turtle	Clemmys guttata
	Wood Turtle	Glyptemys insculpta
	Jefferson/Blue-spotted	Ambystoma pop. 3
Beacon	Fowler's Toad	Anaxyrus fowleri
Bon Terrain Easement (Proposed)	Fowler's Toad	Anaxyrus fowleri
Buck Meadow Conservation & Recreation Area	Spotted Turtle	Clemmys guttata
	Fowler's Toad	Anaxyrus fowleri
Carey Development	Fowler's Toad	Anaxyrus fowleri
	Northern Black Racer	Coluber constrictor constrictor
Curtis Well	Grasshopper Sparrow	Ammodramus savannarum
	Fowler's Toad	Anaxyrus fowleri
Founder's Village	slender bush-clover	Lespedeza virginica
Joe English	Eastern Hognose Snake	Heterodon platirhinos
Joppa Hill Farm	Blanding's Turtle	Emydoidea blandingii
Kaley Park	Grasshopper Sparrow	Ammodramus savannarum
	Fowler's Toad	Anaxyrus fowleri
Merrill Property	slender bush-clover	Lespedeza virginica
Minot J. Ross Memorial Bird Sanctuary	Banded Sunfish	Enneacanthus obesus
Oxbow Conservation Area	Banded Sunfish	Enneacanthus obesus
	Fowler's Toad	Anaxyrus fowleri
Pond Parish	Spotted Turtle	Clemmys guttata
	Blanding's Turtle	Emydoidea blandingii
	Blanding's Turtle	Emydoidea blandingii
	Blanding's Turtle	Emydoidea blandingii
Rte 122 Canoeport	northern wild senna	Senna hebecarpa
	Fowler's Toad	Anaxyrus fowleri
Scott Land	Fowler's Toad	Anaxyrus fowleri
	Wood Turtle	Glyptemys insculpta
	Eastern Hognose Snake	Heterodon platirhinos

APPENDIX B: NRCS SLASH WALL PROJECT

USDA United States Department of Agriculture

Slash Walls

612 – Tree/Shrub Establishment
Guidance Document (15 year lifespan)

Definition and Purpose: Slash walls can protect desirable regeneration from deer browse and allow for regeneration of desirable tree species. This document describes where it is appropriate for NRCS to provide financial assistance to landowners to create slash walls through the Tree/Shrub Establishment (612) practice. The Tree/Shrub Establishment practice can also be used to plant trees and shrubs, but the creation of slash walls to allow for natural regeneration is another way to meet the practice standard.

Requirements for NRCS slash wall projects

- The desired tree species for regeneration must be vulnerable to browse
- Browse is a problem in the project area that would likely prevent desirable regeneration from being successful without protection
- Planned forest management activities are well suited to achieve successful tree species regeneration within the slash wall. This should be described in an existing Forest Management Plan (FMP).

Slash wall around a 3-acre patch cut (with reserves) in Conway, NH

Slash Wall Specifications

- Must be at least 8' tall throughout
- Must be at least 10' wide throughout
- Must be dense enough so that it presents an effective barrier to deer
- Must have no breaks that would allow deer to access the interior area
- Wood to construct the slash wall should be obtained from low grade portions of trees harvested
- Lay overlapping hitches of wood end-to-end around the perimeter of the area to be protected
- Create slash during a timber harvest, when harvest machinery is already on site
- Should be monitored and maintained for the duration of the 15-year lifespan of the Tree/Shrub Establishment practice. A well-made slash wall should require little or no maintenance, but it should be regularly monitored for signs that deer are entering the protection area. If this is the case, action should be taken to repair the section of wall that is failing.

Other Planning Considerations

- In areas with very high deer browse pressure, it may be beneficial to build the slash wall larger than the above minimums, up to 10' tall and 20' wide
- Consider purposefully creating semi-porous areas ("cribs") within the bottom of the wall in several places to allow for smaller wildlife such as turtles to go through, especially in areas with known species of concern.
- Careful consideration should be given to whether the planned harvest will be able to generate enough low grade wood to create an effective slash wall.
    - Over-harvesting just to generate enough material to create a wall should be avoided, and creating the wall should not be used as justification to practice poor silviculture.
    - On wet sites, it may be difficult to get enough brush for a slash wall, since much of that brush may be placed in forest/skid trails. Think similarly about harvests being done during wet times of the year.
- The Cornell Slash Wall Resource Center (https://blogs.cornell.edu/slashwall/) provides more information about the research that has been conducted regarding the effectiveness of slash walls in allowing for a diverse mixture of natural regeneration.

USDA United States Department of Agriculture

Slash Walls

612 – Tree/Shrub Establishment
Implementation Requirements (15 year lifespan)

Producer: | **Contract/App:**

Location: | **Tract Number:**

County: | **Planner:**

Definition

Tree/Shrub Establishment is used to establish woody plants by planting seedlings or cutting, by direct seeding, and/or through natural regeneration.

Practice Purpose

This practice is used to accomplish one or more of the following purposes (check all that apply):

- ☐ Maintain/improve desirable plant diversity, productivity, and health
- ☐ Create or improve wildlife habitat
- ☐ Improve water quality
- ☐ Sequester and store carbon
- ☐ Restore or maintain native plant communities

Planning Details - Slash Wall

Stand # (or location description): | Acres:

Desired Species to Regenerate:

Justification that browse is an issue:

Harvest plan to regenerate desired species within the slash wall (can be copied from FMP)

Plan meets Standards and Specs: (NRCS or TSP signature) | *Date:*

Landowner agrees to install practice to specs: (Landowner Signature) | *Date:*

Certification Checklist

- ☐ Slash wall is at least 8' tall and 10' wide throughout
- ☐ Slash wall presents an effective barrier to deer
- ☐ Practice was implemented to NRCS standards
- ☐ Certification Map, Photos, and GPS points

Certification Notes

Inspector | *Date*

Page 2 - Planning and Certification

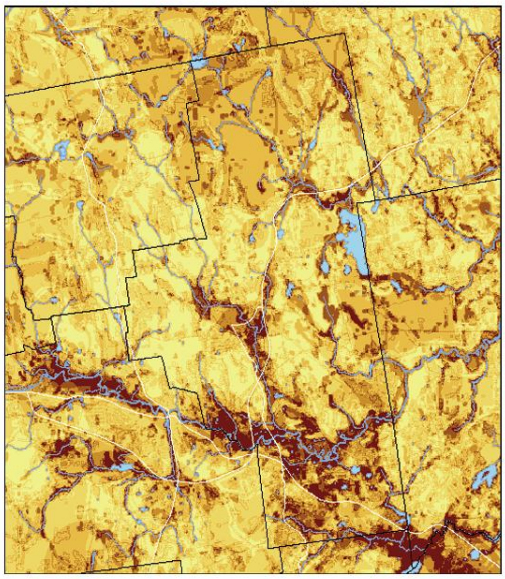
A slash wall and oak regeneration at a 2024 group cut harvest on the Bellamy River Wildlife Management Area, Dover NH.

APPENDIX C: Picking Invasive Plant Battles

"Picking Our Battles": An Invasive Plant Control Strategy for **Amherst, NH**

A town and landscape scale community collaboration to help restore the native biodiversity of New Hampshire.

Priority Areas for Invasive Plant Management



The dark areas are "hot spots" for invasive plant control. The darker the area, the more likely management will both prevent invasive plant spread to new areas and protect critically sensitive natural resources.

MOST WANTED

Invasive Plant Species in Amherst

These species of invasive plant have not yet fully taken root in Amherst. This means they are the easiest battles to fight. Early detection and rapid response to control small populations of these species might prevent them from becoming fully established in your municipality.

- Blunt-leaved privet (*Ligustrum obtusifolium*)
- Dame's rocket (*Hesperis matronalis*)
- Garlic mustard (*Alliaria petiolata*)

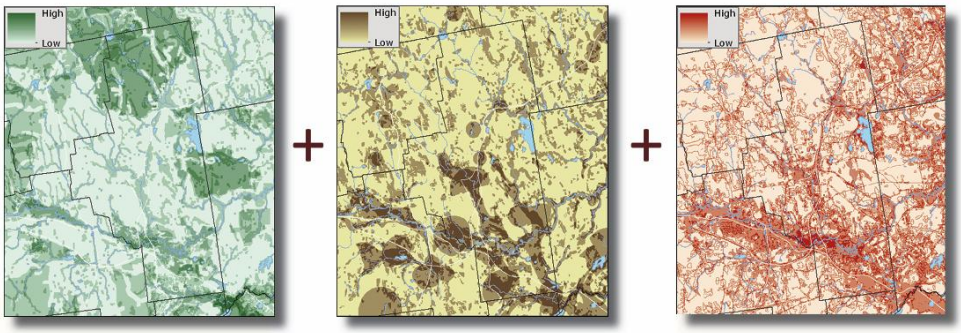
No one knows your municipality like you. If you would like to suggest updates to this list, please contact douglas.cygan@agr.nh.gov

Restoration is a Full Circle ...

Invasive plant species are early colonizers of disturbed soils. Once you have cleared an area and exposed bare ground, remember to plant with native species as soon as possible.

... Pull, ***then Plant!***

How "Hot Spots" for Invasive Plant Control were Identified:



Ecological Significance + Ecological Services Provided + Potential for Spread to New Areas

→ **Priority Areas for Invasive Plant Management**

The model on the previous page was created from three composite layers. These layers represent areas of high ecological significance, areas that provide ecological services to human activities, and areas that, if invasive plants are present, have a high risk of spreading to establish new populations. The model supports a landscape scale prioritization strategy customized for your municipality. More details about the strategy, and suggestions of how to prioritize restoration at the individual property scale, can be found at www.wildnh.com/invasives.

For More Information about Upland and Wetland Invasive Plants

University of New Hampshire Cooperative Extension

Contact your UNH Cooperative Extension County Forester at 329 Mast Road, Suite 101, Goffstown, NH 03045. Phone: (603) 641-6060

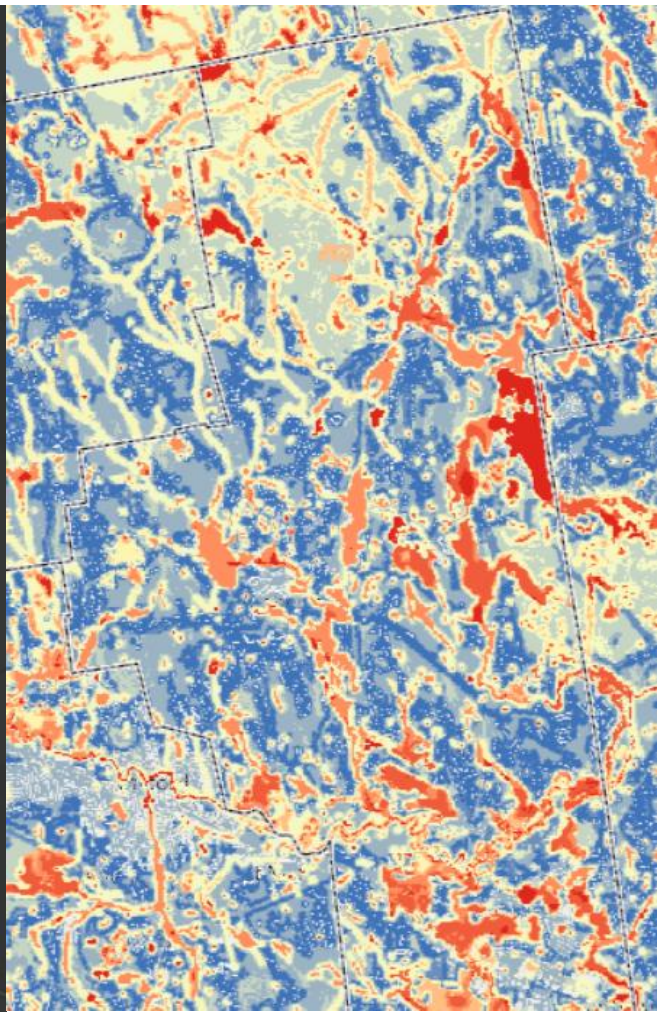
New Hampshire Department of Agriculture, Markets & Food

Check out the "New Hampshire Guide to Upland Invasive Species." NH Dept. of Agriculture Markets and Food, Plant Industry Division. 2nd Edition, 2010 available at www.nh.gov/agric/divisions/plant_industry/documents/invasive-species.pdf

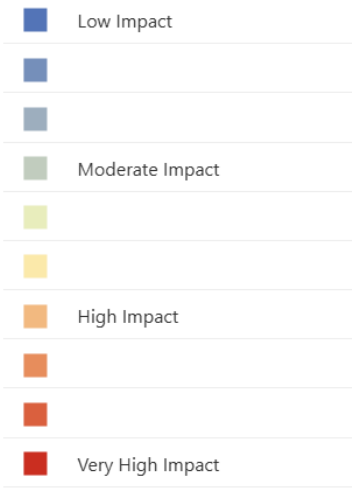
This model was created with input from over 120 individuals, community groups, academics and natural resource professionals. The project was coordinated by the NH Fish and Game Department, NH Natural Heritage Bureau, and Great Bay National Estuarine Research Reserve.

Version 1.0, Jan. 2013

APPENDIX D: Trails for People and Wildlife



The Trails for People and Wildlife heat map with cooler colors indicating areas where trails will have relatively low impact to wildlife and warm colors indicating areas where wildlife will likely be more impacted.



APPENDIX E:

Birdhouse & Nesting Chart

Mass Audubon

By placing birdhouses in backyards, people can help provide valuable nesting sites and attract a greater variety of birds. Different birds prefe different sizes of the hole (or opening) as well as how high that hole is from the birdhouse floor. Here, we identify Massachusetts birds that use birdhouses as well as birdhouse species-specific information.

Species	Floor Size*	Height (front)*	Hole Diam.*	Height to Hole*	Mounting Height (ft)	Habitat	Comments
House Wren	4 x 4	7	1	5	5–10	Old fields and thickets	
Carolina Wren	4 x 4	7	1 1/2 round, or 2 1/2 x 5 slot	5	5–10	Old fields and thickets	
Black-capped Chickadee	4 x 4	9	1 1/8	7	5–15	Open woods and edges	Add 3" of wood chips
Tufted Titmouse	4 x 4	9	1 1/4	7	5–15	Woods and edges	Add 3" of wood chips
White-breasted Nuthatch	4 x 4	9	1 1/4	7	5–15	Woods and edges	Add 3" of wood chips
House Finch	5 x 5	8	1 1/2	6	5–10	Backyards and porches	Also nests in hanging plants
Eastern Bluebird	4 x 4	10	1 1/2 diameter (round), or 2 1/4 high x 1 3/8 wide (oval)	8	4–6	Open land with scattered trees	
Tree Swallow	5 x 5	7	1 3/8	5	5-6	Open land near water	Escape ladder inside front**
Downy Woodpecker	4 x 4	9	1 3/8	7	5–20	Forest openings and edges	Fill box with wood chips
Hairy/Red-headed Woodpecker	6 x 6	12	2	10	8–20	Forest openings and edges	Fill box with wood chips
Northern Flicker	7 x 7	17	2 1/2	15	6–12	Forest openings and edges	Fill box with wood chips

Species	Floor Size*	Height (front)*	Hole Diam.*	Height to Hole*	Mounting Height (ft)	Habitat	Comments
American Kestrel	8 x 8	16	3	13	10–30	Open land with scattered trees	Add 3" wood chips
Eastern Screech-Owl	8 x 8	16	3	13	10–30	Farmland, orchards, woods	Add 3" wood chips
Barred Owl	4 x 14	26	7	23	15–30	Mature bottomland forest	Add 3" wood chips
Wood Duck	12 x 12	22	4 wide x 3 high	17	3 (over water) 30 (over land)	Wooded swamps, bottomland	Add 3" wood chips and escape ladder inside front

Multispecies Birdhouses

Chickadee, nuthatch, wrens, and Downy Woodpecker	4 x 4	8	1 1/4	6	4–20	see above	Add wood chips
Bluebird,Tree Swallow, Carolina Wren	5 x 5	8	1 1/2	6	5	see above	
Hairy and Red-headed Woodpeckers, Saw-whet Owl	6 x 6	11	2 1/2	9	15-20	see above	Add wood chips
Flicker/screech-owl/kestrel	8 x 8	16	3	13	12–20	see above	Add wood chips

Open Nesters

American Robin	6 x 8	8			6–15	Backyards and porches	Place on side of building under an overhang
Eastern Phoebe	6 x 6	6			8–12	Backyards and porches	Place on side of building under an overhang
Barn Swallow	6 x 6	6			8–12	Open areas and farmland	Place on side of building under an overhang

* Measurements in inches; floor size and height are INSIDE dimensions

** Escape ladder consists of grooves carved into inside of front panel, or hardware cloth stapled under hole inside box

Sources: Shalaway (1995); Terres (1994); Pistorius (1981); Cornell Lab of Ornithology (2023)