Forest Stewardship Plan 2020-2030
Fournier Lot- The Grammar School
Town of Conway

Total Forested Acres: 47.3

Natural and anthropogenic disturbance create a mosaic forest in the Grammar School Woods

Presented to: Conway Select Board and The Residents of Conway, 32 Main Street- P.O. Box 240, Conway, MA 01341

Prepared by Wigmore Forest Resource Management

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MLF #250

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FOREST MANAGEMENT PLAN

Submitted to: Massachusetts Department of Conservation and Recreation
For enrollment in CH61/61A/61B and/or Forest Stewardship Program

CHECK-OFFS					Administrative Box			
CH61	CH61A	CH61B	STWSHP	C-S	Case No.		Orig. Case No.	
cert. ☐	cert. ☐	cert. ☐	new ☒	EEA ☒	Owner ID		Add. Case No.	
recert. ☐	recert. ☐	recert. ☐	renew ☐	Other ☐	Date Rec'd		Ecoregion	
amend ☐	amend ☐	amend ☐	FSC ☐	Birds ☐	Plan Period		Topo Name	
			Conservation Rest. ☐		Rare Spp. Hab.		River Basin	
Plan Change: ____ to ____			CR Holder ____					

OWNER, PROPERTY, and PREPARER INFORMATION

Property Owner(s) Town of Conway
Mailing Address 32 Main Street, Conway MA 01341 Phone 413-369-4235
Email Address

Property Location: Town(s) Conway Road(s) South Deerfield Rd, Rt 116

Plan Preparer **Mary Wigmore** Mass. Forester License # 250
Mailing Address 1601 West Road, Williamsburg, MA 01096 Phone 413-628-4594

RECORDS

Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch61/61A 61B *Excluded* Acres	Ch61/61A 61B **Certified** Acres	Stewshp *Excluded* Acres	Stewshp Acres
411	068	2464	320	55.6			12.7	42.9
			TOTALS	55.6			12.7	42.9

Excluded Area Description(s) (if additional space needed, continue on separate paper)
The immediate school grounds as well as the newly developed Highway Department garage and outbuildings are excluded.

HISTORY

Year acquired 1990 Year management began 2007

Are boundaries marked: Yes ☒ blazed/painted/flagged/signs posted (circle all that apply)? No ☐ Partially ☐

What treatments have been prescribed, but not carried out (last 10 years if plan is a recert.)?

stand no. ____ treatment ____ reason ____
(if additional space needed, continue on separate page)

Previous Management Practices (last 10 years)

Stand #	Cutting Plan #	Treatment	Yield	Acres	Date

Remarks: (if additional space needed, continue on separate page)

1. The 2007 harvest yielded excellent silvicultural results.

Landowner Goals- Fournier Property

Please **check** the column that best reflects the importance of the following goals:

Goal	Importance to Me			
	High	**Medium**	**Low**	**Don't Know**
Enhance the Quality/Quantity of Timber Products*			✓	
Generate Immediate Income			✓	
Generate Long Term Income			✓	
Produce Firewood			✓	
Defer or Defray Taxes			NA	
Promote Biological Diversity	✓			
Enhance Habitat for Birds	✓			
Enhance Habitat for Small Animals	✓			
Enhance Habitat for Large Animals	✓			
Improve Access for Walking/Skiing/Recreation	✓			
Maintain or Enhance Privacy			✓	
Improve Hunting or Fishing			✓	
Preserve or Improve Scenic Beauty	✓			
Protect Water Quality	✓			
Protect Unique/Special/ Cultural Areas	✓			
Attain Green Certification Other:			✓	

*This goal must be checked "HIGH" if you are interested in classifying your land under Chapter 61/61A.

In your own words, describe your goals for the property:

Stewardship Purpose

By enrolling in the Forest Stewardship Program and following a Stewardship Plan, I understand that I will be joining with many other landowners across the state in a program that promotes ecologically responsible resource management through the following actions and values:

1. Managing sustainably for long-term forest health, productivity, diversity, and quality.
2. Conserving or enhancing water quality, wetlands, soil productivity, carbon sequestration, biodiversity, cultural, historical, and aesthetic resources.
3. Following a strategy guided by well-founded silvicultural principles to improve timber quality and quantity when wood products are a goal.
4. Setting high standards for foresters, loggers and other operators as practices are implemented; and minimizing negative impacts.
5. Learning how woodlands benefit and affect surrounding communities, and cooperation with neighboring owners to accomplish mutual goals when practical.

Signature (s): _____ Date: _____

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Acknowledgements

This work was made possible with the support of the Massachusetts Executive Office of Energy and Environmental Affairs and the Mohawk Trail Woodlands Partnership. Thank you for that support- it has made this process possible and yielded a great final result and basis for moving forward. The Franklin County Regional Council of Governments also provided invaluable help coordinating and helping this project come together.

The authors would also like to thank the Conway Selectboard, the people of Conway, Beth Girshman in her role as the Mohawk Trail Woodlands Partnership Representative for Conway, and Tom Hutcheson for all their engagement, help, input, and enthusiasm.

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Executive Summary

Figure 1: The central trail through the property provides wonderful access and the opportunity to experience much of the forest.

The Fournier Property is the beautiful wooded backyard to the Grammar School. It has seen well-planned active management in the past with a timber harvest project 13 years ago continuing to yield nice results as the forest develops resiliency. During the planning process leading to the development of this Plan, the Townspeople, Selectboard, and other Stakeholders have worked together to articulate a new vision for the management of these woods.

This vision is adaptive, community-based, and ambitious. It focuses largely on designating a significant portion of the property to be a reserve area where natural processes are largely allowed to play out over time. Paired with this, a focus on trail building, enhancement, and educational signage will highlight this forest's assets to the greater community and to the School particularly. The active portion of management will focus on invasive plant control, the enhancement of young forest, and as an option, a focus tree release treatment.

Overall, this will be an exciting 10 years as Conway, The Mohawk Trail Woodland Partnership, and the region embark on new paths and develop new paradigms of Forest Stewardship in the Commonwealth.

Section 2: Overview of the Conway Town Forest- Fournier Lot

2.1 Landscape and Regional Context

The Fournier lot rests in the hill towns of Franklin County, Massachusetts. This area supports a rich mosaic of forest, farmland, water features, relatively sparse development, a modest rural population, and rolling topography that gives them their name. Conway epitomizes this mosaic based on a mixture of public and private lands managed in a variety of fashions. After its incorporation in 1767, the Town was known for its agrarian pursuits, specifically sheep farming.

2.2 Property's History of Disturbance

Settlement of this area began in 1762 with the development of a farm community. This land was probably cleared for hay production and livestock pasturing. The wood removed, along with the fast rivers and streams in Town, fueled a manufacturing boom that then began its decline in the early 20th century. During its peak, many farms like this were abandoned leaving pastures and fields to be reclaimed once again by forest.

The Fournier family ran a working dairy farm here and worked the agricultural parcels and tended the woods for fuelwood and timber income until the late 1980's. These woods were probably harvested in the 1950's for building lumber with periodic annual firewood and sporadic farm lumber harvests. The 2007 Shelterwood Harvest opened the forest for mixed white pine, hemlock, and hardwood seedling development. On February 25, 2017, a tornado touched down in several places, breaking and snapping stems and crowns of the tall white pines and blowing down whole trees.

Figure 2: Tornado damage in an area that began regenerating after the 2007 harvest. Note the vigorous hardwood poles that have responded to the newly available light.

2.3 General Property Overview

Location and Property Size: The Fournier Lot, also known as the Grammar School Woods, contains 61.4 acres of land as computed from the MassGIS database system Tax Records maps. It adjoins Massachusetts Highway #116, known locally as South Deerfield Road. One enters the land along an improved access road shared by the Town of Conway and Gregory Rose. The Town Highway Department garages and storage sheds, the Conway Grammar School, and its playing fields occupy the southern portion of the property.

Topography, Land Formation and Hydrology: One enters the Fournier property along an improved access road that crosses a broad plateau perched on the steep north bank of the Mill River. The terrain of the property features gentle slopes with some steep crags straddling interior depressions that fill with seep flow. One small rocky chasm provides landscape and terrain biodiversity. In terms of operability, all acres are accessible for stewardship activities.

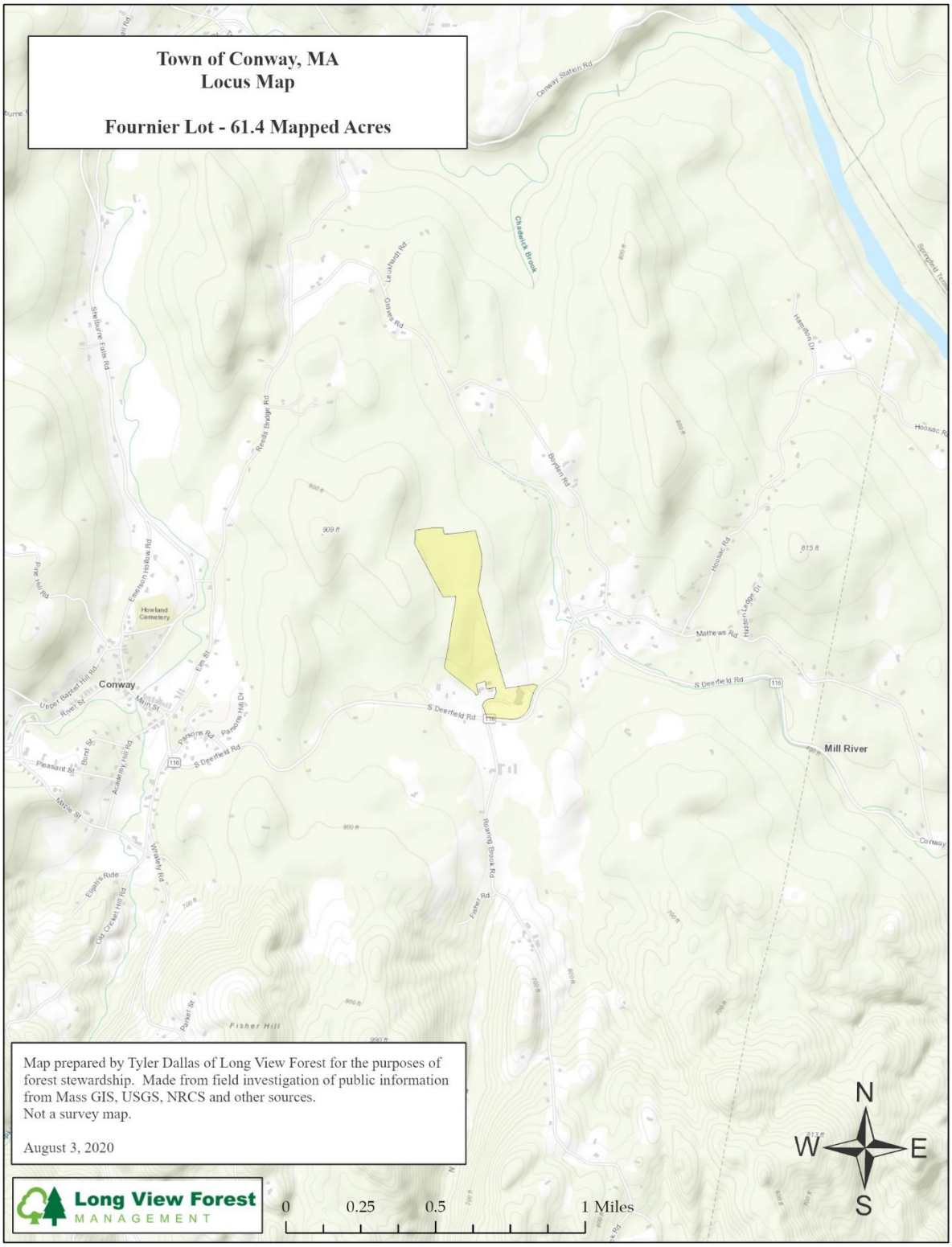


Figure 3: Locus Map showing property location

Figure 4: Small streams, vernal pools, and wetlands dot the property

Several vernal pools dot the landscape (their location is defined on Figure 5: Forest Stand Map). These are seasonal, depressional wetlands that occur and in previously glaciated areas. They are covered by shallow water for variable periods from winter to spring, and some are completely dry for most of the summer and fall. These pools rest upon a mixture of deep clay and bedrock.

The vernal pools serve as essential breeding habitat for certain species of wildlife, including salamanders and frogs (amphibians). Juvenile and adult amphibians associated with vernal pools provide an important food source for small carnivores as well as larger game species. Rich native plant species line the edges of the pool inclusive of blueberries, ilex, and witch hazel.

The vernal pools connect to a lowland wetland system, that fills with spring seep flow and run-off. The system drains southerly into the Mill River watershed basin. This intricate matrix of water and unique herbaceous plants (lycopodium, Christmas fern, starflower, hepaticas, and others) spills out of the crags between knolls and presents a unique visual appeal along the main trail. Water draining off the northern tip of the property circles back though an unnamed tributary into the Mill River basin.

2.4 Forest Soils and Site Productivity

The United States Department of Agriculture classifies and rates soils, which they record in a Soil Survey for Franklin County. Site Index is a term used to describe the potential for trees to grow at a location or "site." The higher the index, the better the growth site is. The site index numbers vary on the woodlot with much of it having Red Oak Site Index of 70, and portions of Stand 2 record a Site Index of 65 for Sugar Maple. Site index numbers are presented in Section 5: Stand Descriptions of this document. These metrics indicate the site's suitability for the productive growth of the tree species found here.

The soils on this property belong to the Chatfield-Hollis complex and their productivity varies as one climbs the gentle grade up away from Route 116. Not surprisingly, Route 116 winds its way through the more fertile soils that in many cases remain(ed) in agriculture due to their productivity and workability. A swath of Swansea muck constitutes a flat, wet area along the central, western edge of the property.

The Chatfield Hollis complex consists of a matrix of the moderately deep and well-drained Chatfield loams found in the flatter areas of uplands between rocks, and the shallow, excessively drained Hollis soils found on upper slopes and rock outcrops. Their coarse texture moves water downward quickly. Available water for tree growth is moderate to exceptionally low (Hollis). Tree rooting depth is limited by shallowness to bedrock (<= 40 inches).

These soils have good structure and functionality, which makes all other forest ecosystem services possible. The soil functions beneath the forest floor include temperature regulation, carbon and nutrient cycling, water cycling and quality, natural "waste" (decomposition) treatment and recycling, and habitat building for most living things and their food.

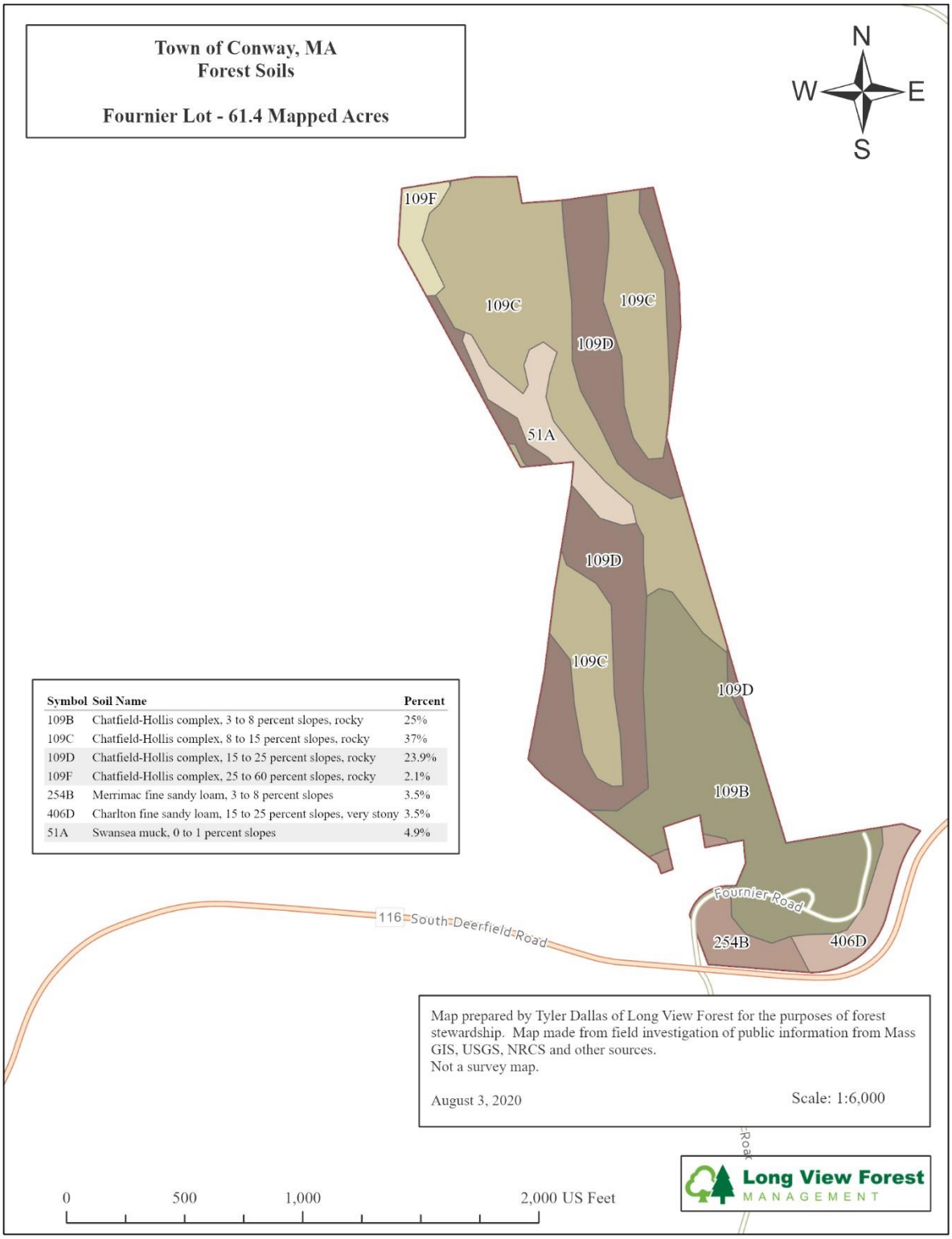


Figure 5: Soils Map

2.5 The Forest Ecosystem: Dominant Forest Types and Ages

The 47.3-acre forest ecosystem on this property is composed of two forest stands. Both feature a predominant hemlock component as well as a promising cohort of young trees, mostly in pockets, that established 13 years ago and are thriving. Collectively the site supports a rudimentary all-aged or un-even aged forest with three cohorts (age groups). The average age range of the overstory trees (tallest and oldest trees in the canopy) is 80 to 120 years with some mature relics (large sized trees, which are remnants of an older forest likely closer to 200 years in age). Two younger age classes grow beneath this main canopy, a scattered stocking of large saplings, pole-sized trees, and small sawtimber, which range in age from 35 to 50 years, and the immature 13-year-old seedlings and small saplings.

The species composition across the property is distributed by basal area (a term that denotes stocking density in a forest) as follows: hemlock (39%), white pine (23.3%), sugar maple (9%), and black birch (9%). Red oak, yellow birch, and red maple are the other important species. Black oak, white oak, shagbark hickory, beech, and big tooth aspen are minor species associates. The white pine, hemlock, red oak, and white ash trees have grown here the longest, while the vigorous black and yellow birch, red maple, beech, and some aspen seeded into the forest due to past disturbances.

The structure of the forest is varied. Stand 1 features majestic pines on rocky ridges with large oaks, plenty of standing dead trees, and good quantities of retained coarse woody material. The new cohort of small trees contains ~8,000 stems <1" diameter at breast height (DBH) per acre. These are mostly black birch and white ash.

Stand 2 is smaller, but more varied stand with an array of larger northern hardwoods including sugar maple, white ash, beech, and yellow birch. It is a remarkable shift from the drier pine areas of Stand 1 into the more mesic hardwoods of Stand 2. The regeneration here is less rich here with ~6,000 stems <1" DBH per acre held mostly in beech and black birch. The shrub layer is lacking in both stands and perhaps represents an area for improvement. There are some patches with brambles or mountain laurel scattered and some thickets around the ice pond.

While growing timber is not a primary objective for this forest, it is interesting to note the large volume of wood growing here. High timber crop volumes indicate the productive capacity of this site and they equate to a high volume of stored metric tons of carbon within these trees. There are 500,000 board feet of timber crops in trees larger than 12 inches in diameter, 640 tons of smaller sized and poorly formed more mature softwood products, and 160 cords of mostly younger and poorer quality hardwood trees.

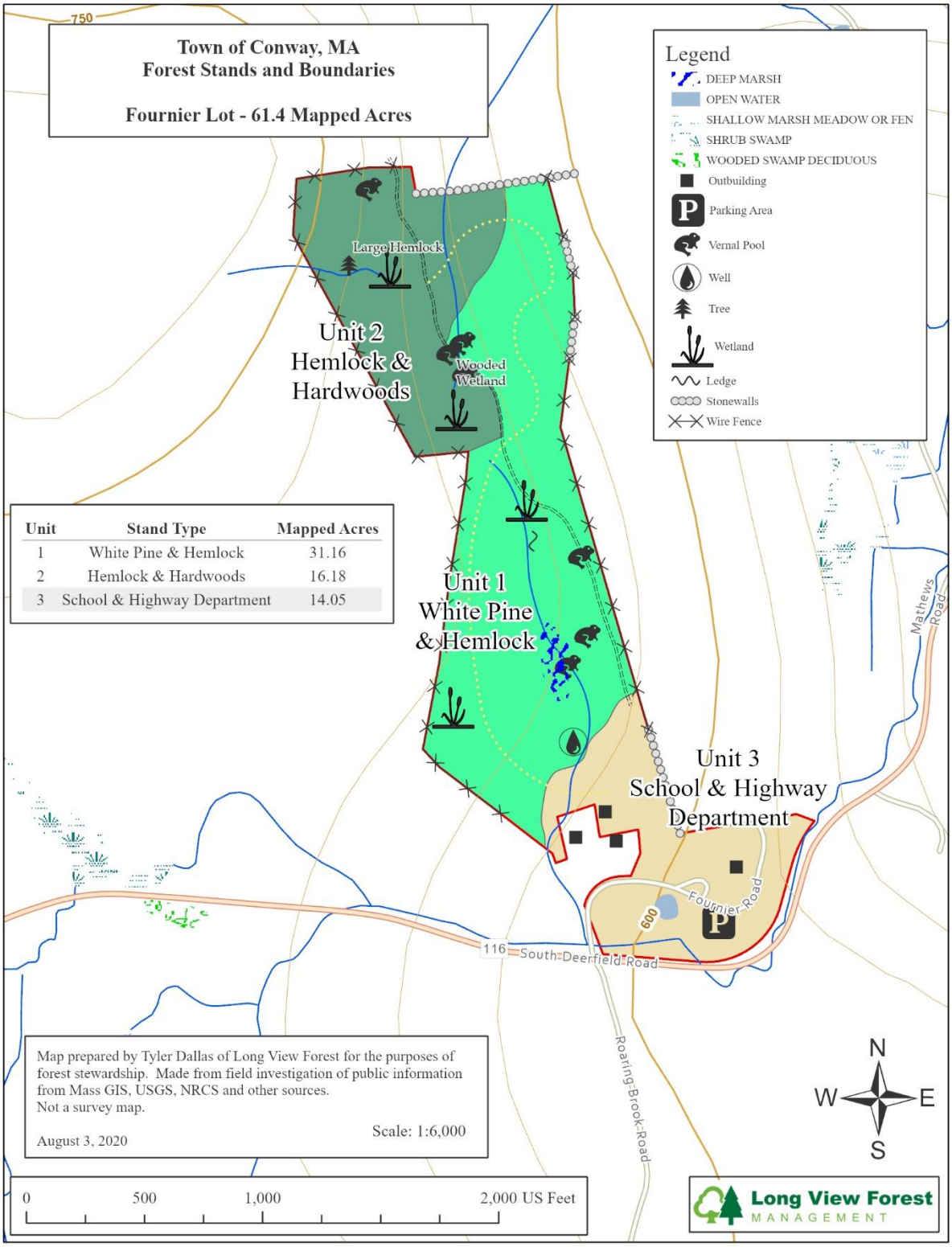


Figure 6: Forest Stands and Features Map

Table 1: Forest Stands

Stand #	Acres	Stand Type	Description
1	31.16	**WK-White Pine/Hemlock**	Nicely managed mixture of pine, hemlock, and vigorous hardwood trees in the over-and mid-story with thick pockets of hardwood regeneration in the 1″-4″ diameter size class.
2	16.18	**HH-Hemlock/Harwood**	A complex mixture of hemlock with mostly northern hardwoods on generally flatter and wetter terrain featuring pockets of regenerating hardwoods with a thick beech component and vernal pools.
Total	47.34		

Another notable metric is the growth that occurred on the site since 2007. Although the harvest reduced the timber volumes and tree stocking, the release of the crowns of the residual trees to increased sunlight, increased the site's productivity, and augmented total carbon stored in the older trees and accumulated in the seedlings and small saplings.

The Surrounding Land Use Map (Figure 9 below) highlights the greenspace connectivity of the area as well and the importance that this small forest plays in it. This map demonstrates this land's proximity to numerous other properties with long-term protection through Conservation Restrictions and classification under Chapter 61/61A/61B inclusive of woodlots, farms, abandoned farms, and habitat refuge zones. Within a few miles of the property are several large parcels of land managed for conservation purposes inclusive of the Warner Family lot on Hoosac Road, Dani and Jack Lochhead's Tree Farm, Mass Audubon's Conway Hills Wildlife Sanctuary, the Antes and Boyden Farms, and the South River State Forest.

2.6 Forest Health and Threats

In crowded forests trees compete for sunlight, water, and nutrients for their sustenance. The 2007 silvicultural project opened the crowns of the residual trees to more sunlight. Trees grow and thrive by photosynthesis; therefore, more vigor equates to a generally healthier forest. With an array of size classes, a diversity of species, and a legacy of thoughtful management, this forest is well-positioned to thrive into the future.

More traditional forest health concepts have broadened as our understanding of the interconnectedness of the forest ecosystem has grown. Not only pests and diseases are considered threats to forest health, but we consider many other agents as health threats today. For example, invasive plant intrusions to the native plant community threaten the symbiotic relationship of trees and their herbaceous, fern, fungal, and microbial

associates in their ecosystem and prevent new tree growth. The extreme weather conditions driven by a changing climate in some cases threaten forest structure, tree vigor, and tree crown health as well.

The two main forest health concerns for the Fournier Property are invasive plants, and the future of hemlock. Eastern hemlock represents nearly ½ the component of this forest. It is a valuable species for habitat cover and nesting sites. During the inventory, we observed both hemlock wooly adelgid and elongate hemlock scale on fallen hemlock branches.

Overall, the hemlock appears to be doing just fine- crowns support green needle mass and since most of the hemlock was retained in the 2007 harvest, hemlock volumes have held steady or increased. Monitoring the hemlock here will be of utmost importance since a rapid decline would significantly impact the forest ecology here- from the light environments in the vernal pools, to the overall aesthetic of the forest itself.

In terms of invasive plants, this property has small, widely scattered populations of oriental bittersweet (*Celastrus orbiculatus*), Japanese barberry (*Berberis thunbergii*)), honeysuckle (*Lonicera spp.),* Multiflora rose (*Rosa multiflora*), and Phragmites (*Phragmites australis)*. Luckily, the 2007 harvest did not result in these plants spreading, although subsequent disturbance might. With that in mind, we recommend a focused control effort to reduce the stocking levels of these plants and suggest planting some native understory shrubs to help diversify the lacking understory here.

During the spring of 2016, a dramatic decline in the health of the eastern white pine was observed throughout Southern New England. Needles of mature trees become straw-colored to brown before they are prematurely shed from the canopy. In some cases, only a few main branches are symptomatic, whereas on other trees, the entire canopy exhibits the symptoms. On this property, the pines appear to have retained their vigor- likely thanks to having better airflow around their crowns after the 2007 management work.

Beech Bark Disease (BBD) is widespread, but not severe on the property where beech is a component. BBD is the outcome of an insect-fungus complex, which results when a non-native beech scale insect (*Cryptococcus fagisuga*) feeds on beech bark, creating cracks through which native canker fungi (Nectria canker) can enter the tree. 50-85% of infected beech trees generally die within 10 years of infestation. The effects of the disease are severe cankering on beech trees, deformation of the stem, and eventual tree death. Many beeches, both large and small, within Stand 2 are infected with this disease. However, there is the occasional, larger beech that seems to have some resistance. These trees should be protected from any management activities as they provide genetic diversity.

2.7 Quality and Variety of Habitat

Forest habitat connotates the idea that the Fournier Woods is a place in which trees and other organisms live. Our acceptance of the community-level and biodiversity conservation approach to forest habitat frames the following discussion. This site supports an array of mostly upland, middle-aged forest habitat that skews largely toward a maturing hemlock and white pine forest with dense patches of newly regeneration hardwoods. This structural diversity resulted from a timber harvest in 2007.

Tall, maturing hemlock and white pine trees provide terrestrial habitat elements in unique ways. As a food source, they provide seeds, needles and buds, bark, and the insects that can be gleaned from their substrates. Seed provides a food source for bird species such as red-breasted nuthatch, common grackle, and evening grosbeak. Black-capped chickadee glean insects from white pine bark, needles, and twigs. Pine and hemlock seeds are a food source for eastern chipmunk, gray squirrel, red squirrel, northern and southern flying squirrels, and white-footed mouse. They are an emergency winter food source for herbivores such as white-tailed deer, and the porcupine is well-known for its tree-barking habits on white pine and winter needle browsing on hemlock, as well as the rectangular-shaped excavations of foraging pileated woodpeckers searching for carpenter ants.

The Eastern hemlock stocking significantly increases the shelter and foraging value of the resulting overstory canopy and as well as horizontal cover value for wintering white-tailed deer. The large white pine stems (usually > 18 inches diameter) with a decaying central core are very valuable habitat elements to large-bodied cavity excavators such as pileated woodpecker and other cavity dwellers such as the barred owl, tufted titmouse, bats, red and gray squirrels, and flying squirrels. Exfoliated plates of white pine bark often provide shelter to many bat species. Northern goshawk, great horned owl, and common raven all use larger white pine trees, among others, in which to nest up against the tree bole. Red squirrels will often construct stick nests in the upper canopy of white pine stands. The scattered hardwood inclusions improve avian habitat diversity compared with pure pine stands.

After the 2007 harvest, a tornado in 2017 knocked down many trees here. Where they crossed the path, these trees were removed from the trail. Otherwise, the Town chose to leave them in the woods where they currently add important wildlife habitat and forest structure. This material recycles nutrients trapped in the wood and provides food and habitat. The list of organisms dependent on this coarse woody material (CWM) for habitat or as a food source includes bacteria, fungi, lichens, mosses, invertebrates

(termites, ants, beetles, and snails), amphibians, birds, and mammals. Large fragments of CWM that provide such habitat for herbs, shrubs, and trees are called nurse logs. Dotting the forest is a rich array of vernal pools. These pools have been mapped, certified with Massachusetts NHESP, and are monitored by locals and used occasionally by the School. Several mole salamanders particularly marbled and Jefferson salamanders use these temporary pools in this upland stand. Fairy shrimp larvae and salamander and wood frog egg masses were noted during the inventory.

The stratified and regenerating forest on this site currently supports particularly strong bird habitat values. During our early spring inventory, we observed 9 bird species and noted ample habitat for them. These included black and white warbler, robin, red eyed vireo, crow, turkey vulture, black throated green warbler, and others. Black and white warblers were particularly common as they utilize coarse woody material. Other important songbird habitat attributes found here include: a thick, rich, partially decomposing leaf and needle layer (supports invertebrate and insect populations for substrate foraging), the dense thickets of young hardwood and white pine seedlings and saplings (cover and nesting sites for birds such song chestnut sided warblers), and the statuesque white pine trees (owl and bird of prey nesting and perching sites).

The richness and diversity of habitats indicate strong forest ecosystem functionality. Species diversity (high number of species), ecosystem diversity (the variety of physical environments and biotic communities on this landscape), and genetic diversity (unique organisms within a species necessary for long term survival against climate change) all interconnect here.

The Massachusetts Department of Fisheries and Wildlife and The Nature Conservancy developed the BioMap2 project, which is a strategic tool for the support of biodiversity protection. It defines landscapes that are most critical for the long-term sustainability of rare and other native species and their habitats and natural, diverse communities. Figure 8: The BioMap2 delineates these valuable, resilient landscapes across the Fournier property as primarily Core Forest Habitat with a subcomponent of lands important for Species of Conservation Concern. These areas are necessary for the long-term persistence of rare species, exemplary natural communities, intact ecosystems, and Species of Conservation Concern (species that meet the criteria for protection under the Massachusetts Endangered Species Act).

2.8 Unique Physical and Cultural Features

This common farm abandonment land use pattern played out across the Fournier property, which was once a part of a larger working dairy farm. Stonewalls, wire fencing, and modified soil profiles attest to the agricultural past. These old fields grew into dense, complex, and highly resilient forests. The remnants of an old ice pond and

the dam suggest the past busy farming community. A series of vernal pools have been identified on the lot by the NHESP.

The property is used by the Grammar School community for educational programs, which connects it to the children of Conway's sense of place. Wandering out of your school and into the enchantment of the vernal pools and quiet beauty of spring wildflowers stays in a child's mind. We recommend enhancing and increasing the frequency of this experience for the children.

Figure 7: The old dam still holds back water- creating a rich wetland area ringed by majestic pines.

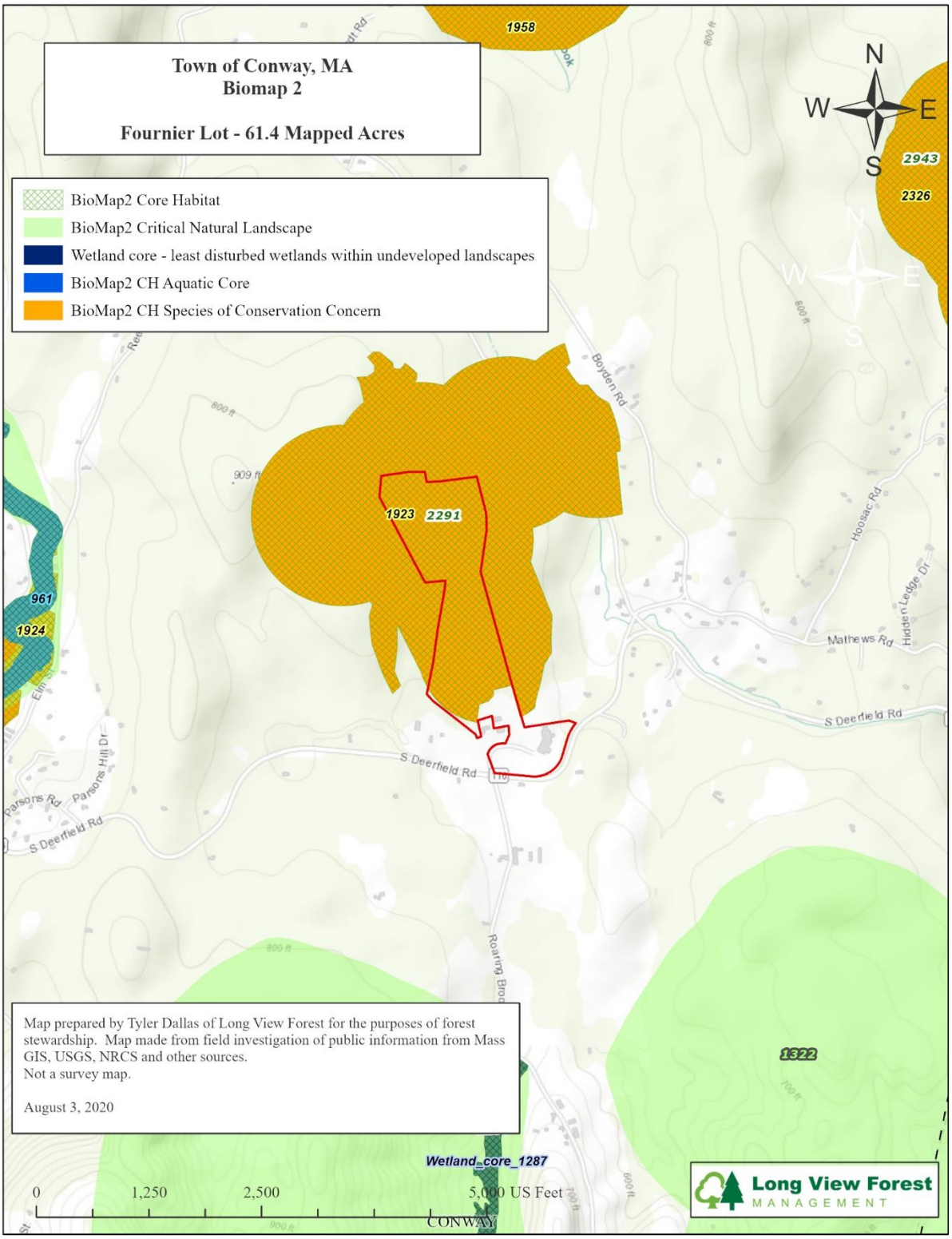


Figure 8: BioMap2 displaying the landscape-wide habitat conditions for protection

2.9 Recreational Uses

A well-maintained hiking and snowmobile trial traverses the center line of the property from the point of access to the northern boundary, at which point it connects to a network of community trails. It provides a pleasing view of the vernal pools, changing forests, ice pond, and some unique native plants. Residents often walk the trail through the center of this property in search of relaxation, botanical study, and natural surroundings. We recommend adding a loop trail to enhance the recreational experience here.

2.10 Property Boundaries

Although the Fournier lot was carved out of a larger dairy farm, the boundaries are delineated by the physical evidence of stone walls and barbed wire fencing as shown on Stand Map. Hanging property identification signs would let the recreational users know that they have entered the Fournier Lot.

2.11 What value or role does the Fournier Lot play in relation to other protected lands and the broader forested landscape?

The Fournier Lot provides a stark forest contrast to the highly traveled corridor of Route 116 and Town facilities as one enters along a wide hiking trail and escapes into the quiet wonder of this property. This lot rests at the southern tip of a long forest block that stretches to the Deerfield River gorge beneath Reeds Bridge Road to the Northampton Watershed lands in Whately. The Totman hayfields, some smaller pastures and mowing, and scattered residential lots marginally break this forest block.

The Nature Conservancy designated the 41,622 acres south of the Fournier property and Route#116 as Tier 1 Matrix Forest Block (TNC Tier 1 Matrix Forest) Matrix sites are large contiguous areas whose size and natural condition allow for the maintenance of ecological processes, viable occurrences of matrix forest communities, embedded large and small patch communities, and embedded species populations.

Matrix community types are often influenced by regional-scale disturbances such as hurricanes, insect outbreaks, or other extreme weather events. They are important as "coarse filters" for the conservation of most common species, wide-ranging fauna such as large herbivores, predators, and forest interior birds. The size and natural condition of the matrix forest allows for the maintenance of dynamic ecological processes and meet the breeding requirements of forest interior songbird species. Furthermore, they aid in climate change adaptation by allowing species to move across gradients of ecological values.

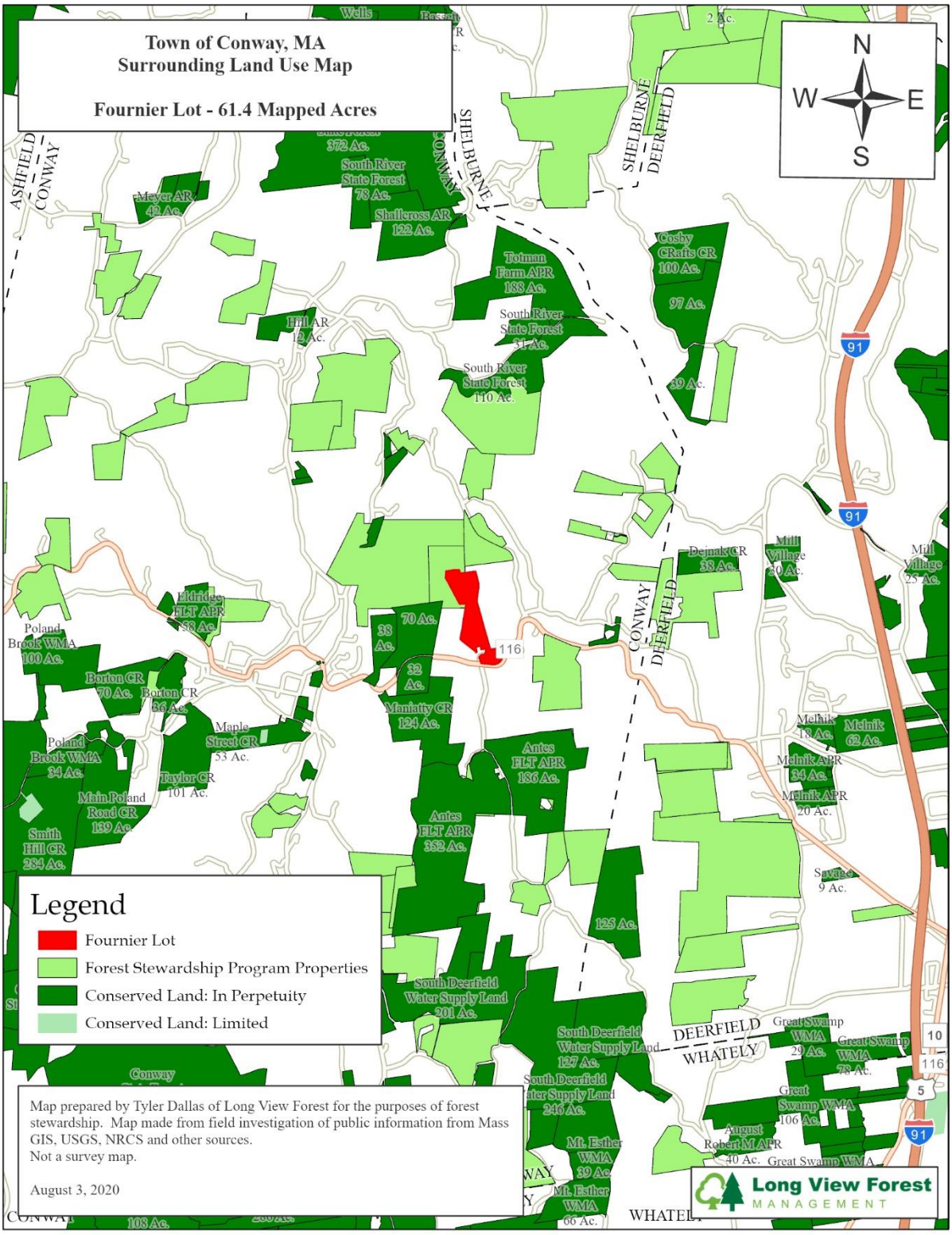


Figure 9: Surrounding Land Use Map

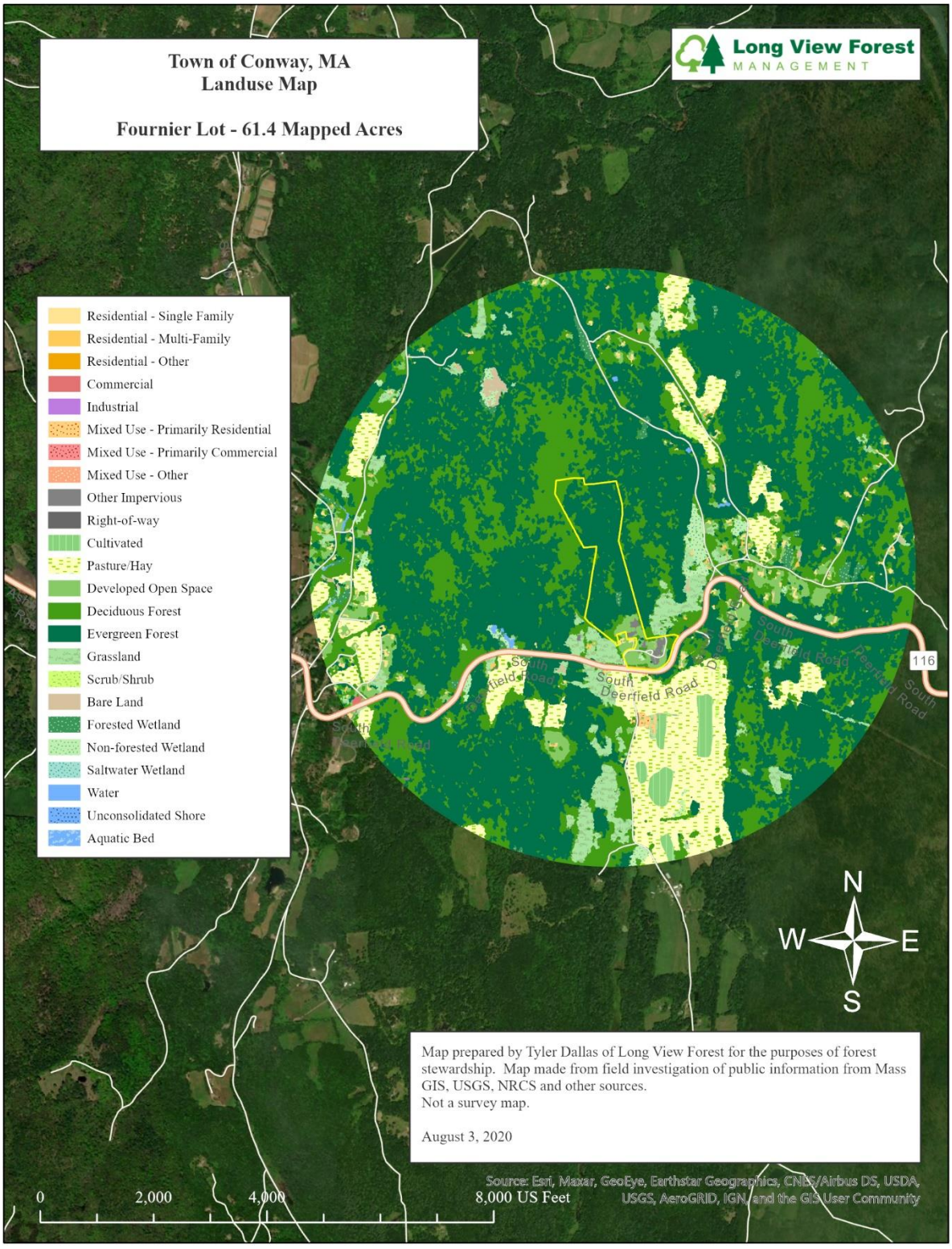


Figure 10: Land use types around the property

2.12 Property Impact of Proposed Forest Stewardship and Sustainable Forestry Practices

Throughout our Stakeholder Outreach and Listening Session Process that drove the creation of this plan, Conway residents articulated their vision of the future forests on the Fournier Lot. The proposed stewardship of these lands will have a positive impact on the surrounding habitat reserves and the ecosystem services and goods that they provide. The proposed sustainable forestry practices detailed in this plan increase the vigor and health of the forest ecosystem and mitigate anticipated climate changes. Forest condition and health improvement measures also enhance the quality of native habitat attributes.

2.13 How Management will impact the local and regional rural economy?

The local and regional economy may benefit from an increase in recreational use of the site and its positive influence on the health and well-being of the community. Folks from outside Conway enjoying these woods would be contributing to the local economy as they stop for lunch or spend an evening in a Bed and Breakfast. With its proximity to the Massachusetts Audubon Conway Hills Wildlife Sanctuary, this forest could easily be a wonderful additional stop on a birder's tour of the area. When forest goods are harvested in the future, local mills, contractors, and firewood processors could benefit from this local, sustainable resource growth and wealth creation.

2.14 Forest Resilience (FR)

As humans understand more about the importance of our forests to our health and our ability to mitigate the coming climate crisis, forest resilience (FR) becomes critical for forest ecosystems. FR means the capacity of a forest to respond to disturbances (natural and man-made) by resisting long term damage or stress and recovering quickly to full functionality and the provision of the goods and benefits that all life needs.

FR has historically been high on the Fournier property, as indicated by its ability to withstand the 2017 tornado with some tree loss and almost no perceptible loss of ecosystem function. These woods have minimal insect and pest infestations, and even mitigable invasive plant issues. We have determined FR is high on this forest because of a set of conditions that are summarized in the following chart. Conway residents rank the protection/enhancement of FR as one of their top stewardship goals.

Table 2: Forest Resilience Indicators on the Fournier Lot

Forest Condition	Why and how this supports High FR
Long term legal protection	Town owned and preserved from change of use- will always support a forest.
Good soil structure and integrity	No recent excessive compaction or erosion so it cycles nutrients, holds water, provides stable banks to wetlands, and supports microorganism activity to build fertility
High biodiversity	Linear relationship to FR, tree species thriving here are well-suited to increasing temperatures of future. The black birch and oak components are particularly promising.
2007 Silviculture based harvest project	Increased individual tree and stand vigor and growth, established adequate tree regeneration, added coarse woody material on forest floor, and increased structural complexity
Connectivity	Forest is a part of a large forest block where animal and plant species can move relatively freely
High water quality	Trail system respectfully avoids vernal pools, spring seeps, water courses and wetlands, dense forest cover in all riparian filter strips
Community support	Vocal and engaged residents who care about the future of this forest and are willing to learn and advocate for its stewardship

2.15 The Fournier Forest and Carbon

Scientists have known for a long time that trees suck CO2 out of the air to live and build their structural tissues. Even though scientific research is ongoing at a furious pace, there is still no solid fact base for how to treat forest for their use as optimal carbon sinks. Some of the science we know now is:

- Mature forests hold more carbon
- Young forests accumulate carbon fast
- Stable, well-structured soils hold a high percentage (~50%) of the carbon that is in the forest carbon pool
- Letting forests grow maximizes carbon storage as the forest grows older, but it opens a vulnerability to dramatic and rapid loss of carbon in the event a major natural catastrophe occurs and loses of some of the sequestration effects of younger forest growth
- A balance of different aged trees, growing at different rates, is good for a carbon sink's functionality
- The embodied carbon of long-term wood products has a positive replacement effect when they substitute for steel, plastics, or concrete
- There is much we don't know and keeping a resilient portfolio of trees of different species and sizes likely remains a very solid strategy

The Fournier property is acting as a good carbon sink right now but could be enhanced. Close monitoring and a thoughtful diversification of age classes over time will enhance this value. The Town's commitment to long periods between intentional forest disturbances and minimization of economics as a decision criterion for forest stewardship guarantee high functionality for both carbon accumulation and storage.

The Town is considering a feasibility study for the inclusion of these Town forests in a possible future Climate Mitigation/Carbon Credit Program. Participation in an Improved Forest Management Carbon Program that use the forests for carbon sequestration and the offset of carbon dioxide emissions elsewhere, requires that forest owners demonstrate "additionality" within their forest stewardship programs and any proposed silvicultural harvests.

A carbon project is considered additional if one can show that the proposed forestry activity within the forest carbon sink removes more greenhouse gas emissions than other alternative forestry activities commonly undertaken locally. Your community would be required to show that a community-approved sustainable forestry practice sequesters more carbon than a "business as usual" approach. The silvicultural projects that would involve harvesting would easily demonstrate additionality.

Section 3: Forest Stewardship Overview

3.1 A New Paradigm for Community-based Forest Stewardship

Thanks to the financial and logistical support from the Massachusetts Executive Office of Energy and Environmental Affairs, this Forest Stewardship Plan and the community outreach, education, and listening processes that drove its creation are together creating a new paradigm for community-based forest stewardship in Massachusetts. This Plan is part of the pilot project here and has yielded many promising results for future work. Here, we summarize what is new and special about this work.

3.1.1 Community-based forestry is a participatory approach to forest management that strengthens communities' capacity to protect and enhance their local forest ecosystems.

Although community forestry is difficult to define, the Forest Stewards Guild has identified some important characteristics:

- Community forestry begins with protecting and restoring the forest.
- Residents have access to the land and its resources and participate in land management decisions.
- Resource managers engage the knowledge of those living closest to the land in developing relationships with the forest.
- Forestry is used as a tool to benefit and strengthen community ties to the forest.

- Cultural values, historic use, resource health, and community needs are considered in management decisions.
- Decision-making is open, transparent, and inclusive.

The Mohawk Trail Woodlands Partnership funding for this Forest Stewardship Management Plan mandated community discussions for the identification of the goals for their forest ecosystems and their education about sustainable forestry practices upon them. Through these efforts we determined that public participation is a necessary component of sustainable forestry practices in Conway. Town residents have a wide range of knowledge, interests, and levels of involvement regarding forestry. Yet they all share a love, an appreciation, and a desire to protect the Fournier Woods. They live here and depend on these forests for social, spiritual, recreational, and cultural sustenance. Who is better qualified to manage their futures?

Perhaps Conway might consider the formal recognition of a Forest Stewardship Committee or Community Forest Advisory Committee or a sub-group within the Parks Department for Trail Stewardship that organizes representation to oversee the monitoring process of the forest ecosystems through time, addresses issues in the forest landscape as they arise (such as possible eligibility for Town forest land for solar installations), and holds future Select Boards accountable for the implementation of community-based sustainable forestry practices on these lands that reflect the Town values for and needs from the forest ecosystem today and in the future.

3.1.2 An Ecosystems Services Framework

Based upon the results of a community survey, this plan, and the community connectivity inherent to its creation introduce and pilot a new paradigm for the decision-making process about forest. Similar processes have unfolded in other forests (For example, Deal, Smith and Gates: Ecosystem services to enhance sustainable forest management in the US: moving from forest service national programs to local projects in the Pacific Northwest, United State Forest Service, 2017) but our work here is new in our Massachusetts context. We think it is promising and worth expanding as more communities' grapple with how to manage their forests.

When viewed from a landscape scale and in accordance with the wishes of the Forest Stewardship Planning Survey (Conway, May 2020) respondents, this document provides guidance for the stewardship of your "special place" under the framework of ecosystem services and ecological function. With this paradigm, your community can more effectively address the challenges facing forests and ensure a healthy, resilient forest ecosystem now and in future generations.

It is commonly recognized the healthy and resilient forest ecosystems deliver goods and benefits to people through their natural processes. **Your community voiced the desire**

to implement sustainable forestry practices only when they will support ecological function and the continual delivery of its essential services. The Millennium Ecological Assessment (MEA 2005- www.milleniumassessment.org) defined these benefits and services with the following four categories:

1. Provisioning - the "goods" such as timber products and fuelwood that humans rely on

2. Regulating – the cycles that maintain our livable world with water purification, oxygen production, climate stabilization (CO2 uptake), and pollination

3. Cultural- these make our world a place we want to live in -aesthetic and spiritual enjoyment of nature, recreational opportunities, solace, and educational opportunities
4.Supporting- the underlying natural processes in a forest that maintain the conditions for life on earth such as soil formation, nutrient cycling, carbon uptake

The Forest Stewardship Planning Survey (Conway, May 2020, LV and WFRM) and the Conway Forest Stewardship Planning Workshops (Zoom Platform, May 26, 2020, and August 26, 2020) provided a clear, condensed set of goals and objectives for the stewardship of your Town forests. This plan proposes a set of sustainable forestry practices (SFPs) that are realistic given the Town's finite human resources, time, and financial resources. These SFP's were determined in terms of ecological outcomes such as improving forest ecosystem function, increasing forest resilience, and maintaining or enhancing goods and services provided to the community. Marketable timber goods consistently ranked as the lowest priority.

3.2 Management Goals 2020-2030

The community stated the following goals for the forest stewardship on the Fournier Woods for 2020 to 2030:

1. Sustain biological richness defined as all forms of life within the forest and their ecological roles and the different ecosystems, landscapes where they function, species, and genetic codes present here now.

2. Sustain the ecological services and benefits provided to humans from these forests defined as:
    a. Social and emotional goods- support well-being, relaxation, spiritual sustenance, study of nature, and recreational opportunities.
    b. Hydrologic cycle through which forests absorb water from soil and atmosphere and return it and filter it for its improved quality

c. Soil quality and function as forests filter toxins before they enter the soils, anchor soils in place, support microbial and microorganism activity to build soils, which support all life.
d. Climate Regulation - protect and promote the forests' use as a carbon sink that pulls CO2 out of the air via photosynthesis, accumulates and sequesters carbon, and stores it in boles, leaves, branches, and roots thereby mitigating the threats of climate change.
e. Economic goods- timber products and fuelwood- lowest priority objective, but members of the community value these goods and services.
f. Cultural values-some of the history of Conway is held on these lands.

3. Sustain forest resilience.

4. Promote the health and productive capacity of the forest trees and regenerate these forests to perpetuate their ecological benefits and functions.

3.3 Sustainable Forestry Practices

A full set of useful objectives and sustainable forestry practices useful for their achievement can be reviewed in **Appendix A**. **Appendix A** is the distillation of our Forest Stewardship Planning Workshop, the Community Forest Stewardship Survey, and the many conversations related to this project that we have had with community members over the phone, in person, and on individual emails. It is inclusive and it is ambitious. The next sections of this document introduce a sub-set of Appendix A for the convenience of publishing. This full set could be revisited at any future date by the community.

Your implementation of these strategies depends upon the Town's commitment to Forest Stewardship, the availability of grants and funding, and your community's ability to reach consensus and work together in the future. Individual and unique Sustainable Forestry Practices that might achieve your stated goals within the Fournier Woods are presented in the chart below. Your community clearly stated the acceptance of the use of sustainable forestry practices inclusive of silvicultural harvesting, if an only if these practices promote the achievement of the above stated goals and objectives. They do not support the use of SFP's exclusively for the goal of economic gain.

Table 3: Sustainable Forestry Practices Recommendations:

Stand	Forest Type	Forest Management Recommendation	Extent of Practice	Timing	Ecosystem function and management goals these practices will enhance or promote
1 and 2	WK, HH	**Invasive Plant Control Measures-**Manually remove invasive plants using community resources or grant funding. Adapt an annual monitoring process for early detection and control of future threats.	<0.5 dispersed acres	2020-2022	Sustain biological richness and native plant diversity. Sustain Forest Resilience.
1	WK	**Creation of Young Forest patches-** Install a patch cut or widen an existing gap to create a new set of early successional habitat and to diverse the forest's set of age classes as the 2007 age class matures.	~1-2 acres	2020-2025	Sustain Biological Richness- tree size and age diversity. Sustain Forest Resilience. Sustain ecological services-climate mitigation- increase carbon accumulation.
1,2	WK, HH	**Native Shrub Planting in riparian zones and poorly stocked xeric uplands**-Plant a wide array of native understory plants to increase wildlife food sources and increase property-wide biodiversity	<2-acres	2021	Sustain biological richness. Sustain ecological services-Hydrologic cycle. Sustain forest resilience.
1	WK	**Trail Mapping, Assessment, Construction, and Maintenance-** Develop a thoughtfully placed loop trail connecting from northern tip of woods road back around to the ice pond. GIS mapping of Town trails. Publish new trail map. Develop maintenance plan. Build new trail if consensus. Install directional and permitted use signage.	Linear feet	2020-2030	Sustain ecological goods and services-social and emotional goods. Sustain ecological services-Soil quality and function.
1 and 2	WK, HH	**Reserve Forest and Pro-forestation area-**Designate, map, and set aside and map	Stand 2 and northern parts of Stand 1.	2020-2021	Sustain ecological services- climate regulation.

		~25-acres of representative acres across both forest types to serve as a reserve area. Complement active forest stewardship with limited pro-forestation.	Vernal Pools in southern section of Stand 1 are protected as well by default.		Sustain forest resilience.
1 and 2	WK, HH	**Educational Outreach**-Install educational and demonstration signage for interpretive purposes along the trail system, engage school staff and include natural history of the property in school curriculum. Community learning walks.	Signage along trail and at points of ecological and historic interest. All season tours to build community appreciation.	2020-2030	Sustain ecological services- social and emotional goods.
1	WK	**Silvicultural Practice**- Focus Tree Release	Appropriate portions of Stand 1. ~15 acres.	2025	Promote health and productive capacity of the forest trees-Sustain economic goods. Sustain biodiversity and forest structural complexity. Sustain Forest Resilience.
1,2	WK, HH	Develop and Archive **Town Best Management Practices** for use with trail work and silviculture.	Property Wide	2020-2024	Sustain Ecological Function and Ecosystem Goods and Services-Water and Soils Quality and Function.
1,2	WK, HH	**Participation in a Carbon Program -**either through marketing scheme with a carbon credit vendor or the possible Massachusetts EEA sponsored programs.	Property Wide	2020-2030	Sustain Ecological Function-Climate Adaptation, Carbon Storage and Accumulation.
1,2	WK, HH	**Boundary delineation with discrete signage.**	Property Wide	2020-2022	Sustain ecosystem goods and services-social and cultural values.

3.4 Role of Silviculture

Ecosystem function and ecological dynamics do rely on intentional forest disturbance in the form of tree fellings and/or tree harvesting. If future community consensus supports the use of Sustainable Forestry Practices (SFP's), they would be conducted under the umbrella of ecological forestry (EF). EF enhances the growth of desirable species, protects native plant communities, and promotes regeneration through the application of silviculture. The harvest and non-harvest silvicultural techniques, which might be used if acceptable to the community under EF, are described in Appendix B, Silviculture Harvest and Non-Harvest Techniques.

3.5 Adaptive Management

Forests are living, dynamic systems trying to thrive in a complex environment subject to the stress of a changing climate. Forest stewardship planning efforts should accommodate this change. This document advocates the practice of Adaptive Forest Resource Management, which is a systematic approach for improving resource management by learning from management outcomes, changing climate and forest conditions, and evolving consciousness and knowledge at the individual and community scale.

If forestry is about planning, then planning should be adaptive to what happens in the forest when planned or unplanned. The diverse elements of this management plan document should be re-evaluated when new scientific information and community values change in time. This is particularly true as it relates to managing forests for carbon. Economic, ecological, climate, and social elements must also be adjusted as community dynamics change. The Townspeople of Conway in 1900 would likely have a quite different take on the woods than we do today, and as future generations will have in another 100 years.

An adaptive stewardship approach involves exploring alternative ways to meet management objectives, implementing one or more of these alternatives, monitoring to learn about the impacts of an action, and then using the results to update knowledge and adjust future actions. There is no strict timeline suggested for this type of review, but some effort should be made each year. A Town Committee on Forestry could oversee this work with the ideas and strategies within this document as a guide for the development of a climate-adaptive, carbon-friendly, resilient forest ecosystem development approach.

Section 4: Field Methodology

4.1 Forest Inventory

Field method for tree data and volume per acre: In all stands, a nested point-sampling cruise was conducted using a BAF-10 prism for "count trees" and a BAF-10 prism for volume trees (diameter and height) Product volumes were calculated using Forest Metrix, a forestry software package. Results are reported in the Stand Overview table.

We installed 18 plots across the forest to collect our data. In addition to the tree data, we measured:

1. Regeneration via mil-acre plots,
2. Snags, coarse woody material, and forest structure,
3. Invasive plant densities, and
4. Birds via visual and aural identification

4.2 Site Index

Site index for each stand was estimated using data from the Natural Resources Conservation Service, U.S. Department of Agriculture, Web Soil Survey. This survey is available online at www.websoilsurvey.nrcs.usda.gov. Site index by species was determined by weighted average based on the estimated percentage of the soil types within a stand.

4.3 Soils

Soils data were obtained from MassGIS, Office of Geographic Information, and Commonwealth of Massachusetts from the layer GISDATA_SOILS_POLY_SV_MUNAME. Stand maps were georeferenced to the soils layer to delineate soil types.

4.4 Mapping

GIS data was obtained from MassGIS, Office of Geographic Information, and Commonwealth of Massachusetts. Layers included the following and the appropriate aerial imagery from the same source.

Standardized "Level 3" Assessors' Parcels

GISDATA_SOILS_POLY_SV_MUNAME

USGS Color Orthoimage (2013/2014)
USGS Topographic Quadrangle Images
Protected and Recreational Open Space
BioMap2
Mass DOT Roads
Land Use (2005)
Contours (1:5,000)
MassDEP Wetlands
National Wetlands Inventory
USGS Hydrography

Stand maps, developed from aerial imagery, and further refined during field investigation using GPS, were geo-referenced to a base layer that covered the property and surrounding area.

Section 5: Forest Stand Descriptions

5.1 Stand 1: White Pine Hemlock

Figure 11: This white pine-hemlock stand is the representative stand for this property.

5.1.1 Overview

This is a stand of majestic pines, vibrant regeneration, and dynamic processes of individual tree disturbance by wind, ice, and tornadoes both before and after the most recent management work that was done here in 2007. Filling the southern half of the property and then stretching along the eastern boundary of the property, this stand is representative of the property- it is what most people who visit the property experience, and it is the place with the most immediate need for stewardship activities and monitoring as the Town looks to mitigate the invasive plant infestation, develop trails and new forest habitats, and protect the rare, threatened, and endangered species (RTE's) documented on site.

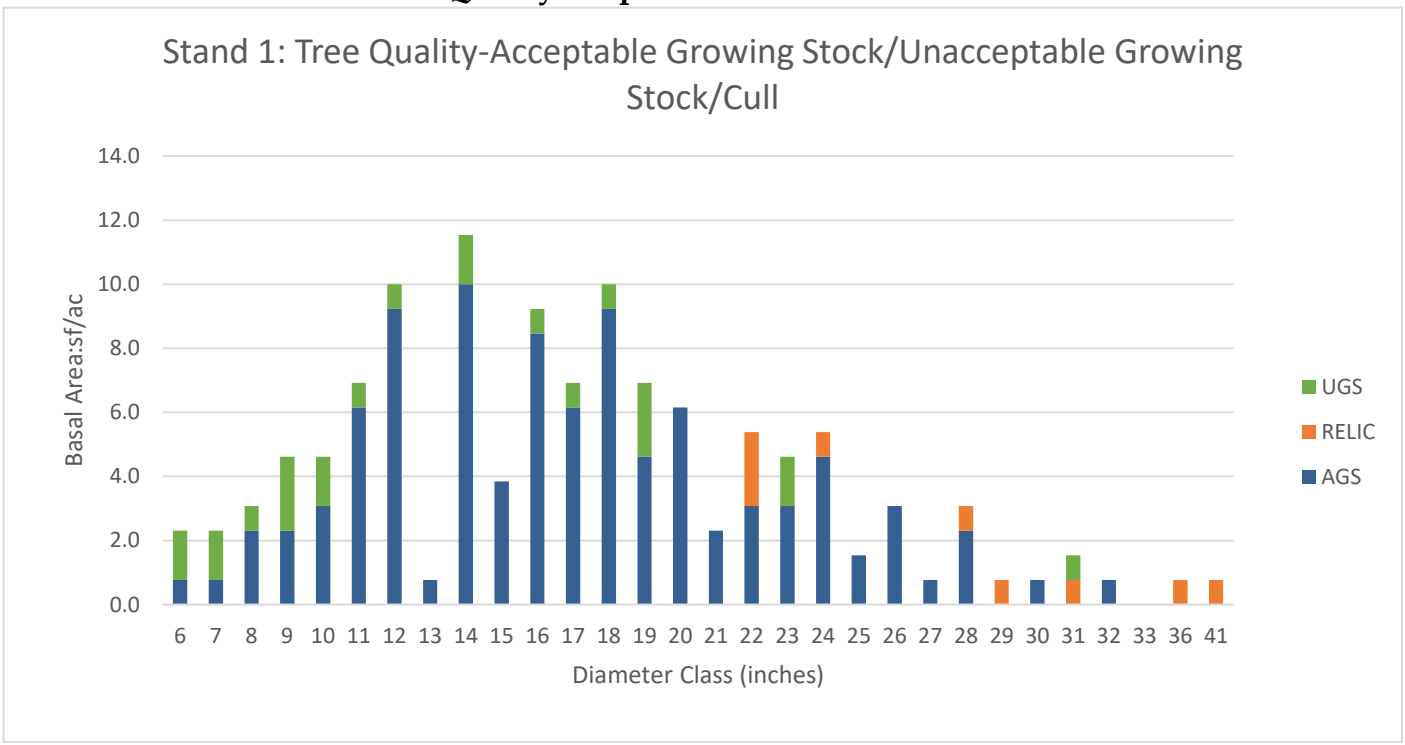
Dotted with vernal pools and filled with vibrant migratory and resident bird communities, Stand 1 is poised to continue evolving its diverse framework - adding new trees, maturing the ones that are there, sequestering and storing carbon, and providing the rich forest experience people expect when visiting.

Table 4: Stand 1 Summary Data

Objective	Stand	Forest Type	Area	MSD or Size Class	Basal Area Per Acre	Growing Stock Analysis	Volume Per Acre*	Site Index
Stewardship	1	WK	31.16 acres	14" WP:19" RO: 23"	121 ft^2	AGS: 96 ft^2 UGS: 18 ft^2 RELIC: 7 ft^2	12.3 MBF 3.2 Cords 16.5 Tons	70: RO

*Sampled volume, does not include top wood

Table 5: Stand 1 Tree Quality Graph



5.1.2 Terrain and Soils

This is a diverse stand in terms of ground and form- it features exposed bedrock, mostly shallow soils, some steep slopes, and some nice plateaus where past management has focused its regeneration efforts. The soils all belong to the Chatfield-Hollis complex except for a small intrusion of Swansea muck.

5.1.3 Canopy Layers

This is a multi-aged Stand that features 3 distinct canopy layers, but a somewhat depauperate understory. Emergent, and towering over the stand, we have the white pine component. These are large, mostly wind-firm, mature pines that area growing significantly and appear quite healthy. Under them, we have a thick hemlock component that holds most of the canopy in this Stand except where it was perforated by the 2007 harvest. In these areas, and in areas adjacent to these openings where sunlight reaches the forest floor, we have a robust new cohort of saplings- mostly black birch. Some patches of young pines exist as well. Birch is a reliable seed producer that is less prone to deer browse than the oak, hemlock, or maple components here.

5.1.4 Regeneration/Ground Cover

This Stand has a good duff layer with adequate leaf litter in places to support foraging by birds and mammals.

The understory in this stand is, however, lacking. This is largely due to a lack of light, but likely also due to herbivory pressure from deer. During the inventory we noted deer scat and buck rub trees in abundance. There is little regeneration establishing itself here and what we did observe were mostly first year maple seedlings that tend to get mowed by the deer each year and don't move from seedling to sapling as they would otherwise.

To improve this situation, more light on the forest floor is needed. This will come with natural disturbance, or with a purposeful establishment effort. Also, the Town could consider planting shade tolerant, understory plants with high wildlife value such as maple leaved viburnum.

5.1.5 Interfering/Invasive Plants

There are scattered barberry plants in this stand, as well as some honeysuckle and bittersweet out towards the open land, but overall, this stand is in good shape in terms of invasive plants. Individual stems and scattered clusters were found across the forest floor. There is one small concentration of phragmites along the trail. These should all be manually removed as soon as possible by completely pulling out the plant and disposing of it by letting it desiccate somewhere secure- either on-site in the forest, or off-site.

Native beech, ferns, and grapes can often be significant impediments to the development of a balanced, resilient forest. In this stand, these species are not an issue

at this point. The 2007 harvest managed to do its work well and didn't exacerbate any existing pre-conditions.

5.1.6 Habitat

This is a Stand in transition from a habitat perspective. A mostly single-aged, middle-aged forest of hemlock and pine is transitioning to a multi-aged stand with an array of habitat features provided by the trees and other vegetation. The patches of young forest from 2007 are giving way to poles and hence losing some aspects of their habitat value- particularly for birds and their fledging young.

However, the mature component of pine and hemlock remains important as it provides high nesting sites for mammals and birds, good winter cover for all creatures, and food sources for mostly squirrels.

Our inventory also revealed a high density of snags and large relic trees- See Table 5. These relic trees can be thought of as a third age class in the forest- they are often old pasture trees that pre-date the current forest assemblage. Many are dying, or dead, and provide immense habitat value as well a legacy seed source. Cavity nesting species, like barred owls, often utilize big relic trees like some of the sugar maple and oaks found in this stand.

5.1.7 Forest Health

Aside from the hemlock wooly adelgid and elongate hemlock scale, this is a relatively healthy Stand. As noted, the pine seems to have escaped damage, or recovered quickly from the host of stressors resulting in needle dropping in the pines in our region in the last 10 years.

5.1.8 Unique Features

The vernal pools, ice pond, and chasm above it are all unique features in this stand. The Natural Heritage Program also highlights the occurrence of RTE's in this stand and stewardship shall take them into consideration when any activities are planned as the Town has successfully done in the past.

5.1.9 Desired Future Condition

Given the Town's current goals for the next 10 years, this stand is just where it needs to be. Long term, the desired future condition is a multi-aged forest with pine, hemlock, and hardwood components that is managed on a longer rotation. If one were to walk through these woods in 25 years, you would see large-sized hemlock and white pine trees (over 24 inches in diameter) and some scattered relic or legacy stems towering

above healthy, species- rich middle and lower canopy layers of red oak, yellow birch, black birch, red maple, sugar maple, ash, cherry, and aspen. Birdsong would greet you from scattered thickets of seedlings and saplings. Some large downed woody material would be host to small pole yellow birch or red maple stems. Hemlock has held on in these woods due to the site productivity. This overall condition was maintained using conservative silvicultural practices such as Legacy/Focus Tree Release.

Figure 12: The rocky chasm above the ice pond- surely this is a highlight for any local child visiting.

5.2 Stand 2- Hemlock Hardwood

Figure 13: A relatively disease-resistant beech tree stands tall. Note the diversity of trees in the canopy here

5.2.1 Overview

Stand 2 occupies the more remote northwestern section of the property. Here, the pine drops out and gives way to a more northern hardwood- hemlock forest that wraps around exemplary vernal pools and a forest wetland on Swansea Muck soils. Smatterings of mountain laurel let you know you are still in the Oak-Northern Hardwood Transition forest, but otherwise you feel in a higher altitude forest.

American Beech is present across this Stand and in some cases is crowding out other species. Some of the beech is diseased, but there are also a few examples of resistant trees that remain health. These should be protected under any forest management scenario. The 2007 harvest pushed into this Stand somewhat with similarly good results as occurred in Stand 1. There is a diverse cohort of new young trees including black birch, pin cherry, beech, and red maple. Tornado damage in these regenerating areas

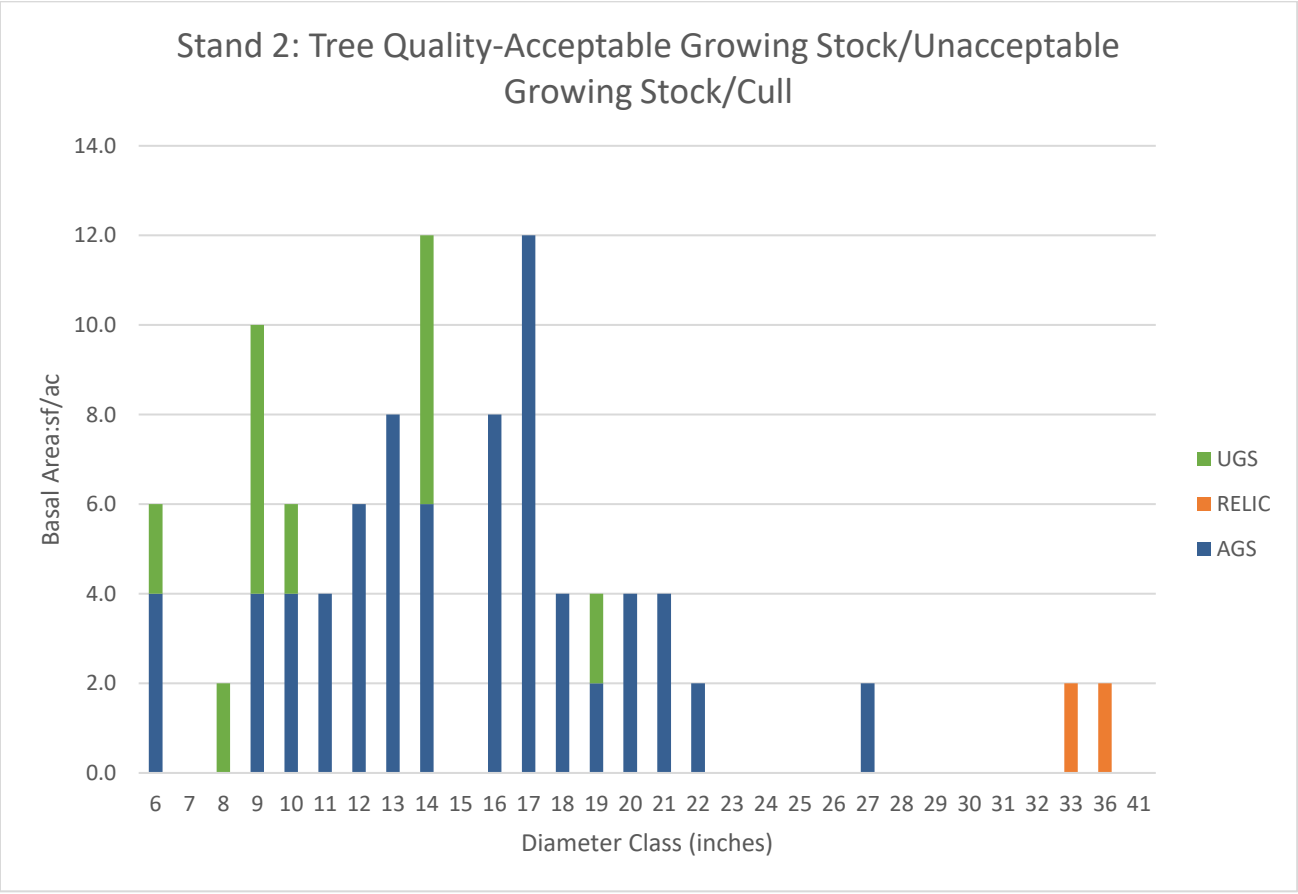
was mitigated by the young trees which quickly occupied the newly available growing space as they did in Stand 1 as well.

Table 6: Stand 2 Summary

Objective	Stand	Forest Type	Area	MSD or Size Class	Basal Area Per Acre	Growing Stock Analysis	Volume Per Acre*	Site Index
Stewardship	2	HH-Hemlock-Hardwood	16.18 acres	12'' WP: 21" RO: 21" WA:19"	98 ft^2	AGS: 74 ft^2 UGS: 20 ft^2 RELIC: 4 ft^2	7.2 MBF 5.3 Cords 10.1 Tons	70: RO 65: SM

*Sampled volume, does not include top wood

Table 7: Stand 2 Tree Quality Graph



5.2.2 Terrain and Soils

Compared with Stand 1, this is a flatter, more homogenous area. It also features soils from the Chatfield-Hollis complex with one steeper section in the back corner as the land begins to rise. Much of the stand is a flat area of Swansea Muck- these wetland soils grow trees, but tip-ups abound and small braided channels of running water move amongst fallen and rotting trees. Vernal pools dot the depressions here.

5.2.3 Canopy Layers

The canopy here has multiple layers thanks to the diversity of species, the resilience of the forest to ongoing single tree disturbance, and to the management work from 2007. Sugar maple, red maple, birches, beech, and the occasional pine or oak share the overstory with some larger hemlocks. Hemlock and beech largely occupy the mid-story while beech, birches, hemlock, and mountain laurel make up the understory.

5.2.4 Regeneration/Ground Cover

Like Stand 1, this Stand has a good duff layer with adequate leaf litter in places to support foraging by birds and mammals. Our inventory plots all noted good or excellent leaf litter. Also, there is an abundance of natural and man-made coarse woody material here. These slowly decomposing material is valuable as habitat and foraging terrain.

The understory in this stand is composed largely of shade tolerant hemlock and beech. Where the wetland picks up, ferns abound along with other mosses and wetland-obligate plants. Diverse regeneration is lacking. There is little to no advance regeneration seedling stocking. Some beech and hemlock seedlings are present, but notably maple, oak, and birch seedlings are lacking.

To improve this situation, more light on the forest floor is needed. This will come with natural disturbance, or with a purposeful establishment effort. Also, the Town could consider planting shade tolerant, understory plants with high wildlife value- here, hobblebush would be an appropriate choice.

5.2.5 Interfering/Invasive Plants

This Stand appears to be currently free of invasive plants and outside of the wetland, ferns are not an interfering issue here. However, our inventory work was not an exhaustive plant survey and so we recommend a careful walk-through to manually remove any invasive plants. This can be done in conjunction with similar work in the more infested Stand 1.

5.2.6 Habitat

The habitat assessment and analysis from Stand 1 holds for this stand. This is a stand in transition as vigorous clumps of new trees thrive in the gaps made by logging and the tornado. However, more of this Stand was not managed during 2007 and so it retains a more interior forest feel to it. The wetland and vernal pools are obvious central features form a habitat perspective- both for the water they provide year-round, and for the unique habitats they provide to vernal-pool obligate creatures.

The beech component, with its nut production, adds important habitat value for bear, deer, turkey, and rodents while the yellow birch provides valuable gleaning terrain for insectivorous birds. The thicker, shrubbier mountain laurel and beech areas provide good cover component not found in Stand 1. It is easy to imagine resident wildlife moving back and forth between these two areas or venturing out from the thicket into nearby agricultural lands.

5.2.7 Forest Health

The main forest health concerns here remain the threats to hemlock and the beech bark disease. Careful and regular monitoring will be the best antidote here. If hemlock mortality rises, corrective actions might be warranted which could include cutting small patches of diseased trees or other approaches. The 2007 harvest has already helped prepare this Stand for a smooth transition during this eventuality, and more recruitment of young trees could help further.

5.2.8 Unique Features

The unique features of this Stand are the vernal pools. The most northerly one is particularly large and special and features spits of land protruding into it covered with highbush blueberries. These pools undoubtedly support the RTEs identified on the property.

5.2.9 Desired Future Condition

This area was minimally disturbed during the 2007 harvest operation. The dense grove of mixed hemlock and hardwood will continue to develop in its two-aged condition. Designation of this stand as a habitat niche for preservation offers long-term protection to the vernal pool complex in this remote area. The main hiking trail bisects this area and provides access to the northern community snowmobile and hiking trails. Like Stand 1, a gradual, thoughtful, long-term approach here paired with careful monitoring will yield the best results.

Figure 14: Pin cherry and black birch compete in a space opened by the 2007 logging and made more open by the tornado. Note the abundance of coarse woody material on the forest floor.

Section 6: Sustainable Forestry Practices Recommended for 2020-2030

The following sub-set of Sustainable Forestry Practices is based on the community-wide visioning process, the survey results, and the biophysical reality of what is going on in the forest right now. We recommend them as one alternative for the achievement of your stated goals and objectives. Implementation of these practices requires a sustained careful, community-based consensus building effort, Town and State-level funding, and a commitment of Town's human, time, and financial resources. We present the objectives as identified and prioritized by your Townspeople and consistent with the summary table, Table 3, we presented on page 32 of this Plan. Each proposed practice is linked to a stated goal or objective as summarized on page 30 and in Appendix A.

6.1 Discussion: Your community stated in survey results and during the Forest Stewardship Planning Workshops that **you are willing to implement sustainable forestry practices only when they will support ecological function and the continual delivery of the forest's essential services**. The proposals below support this premise. They are an expedient sub-set of the wide range of possible practices that were derived from our work together as presented in Appendix A. We strongly suggest that Conway devise a consensus building process or mechanism that prepares the community for the implementation of this sub-set or any future derivative to honor the spirit of this Community-based Forest Stewardship Planning Project.

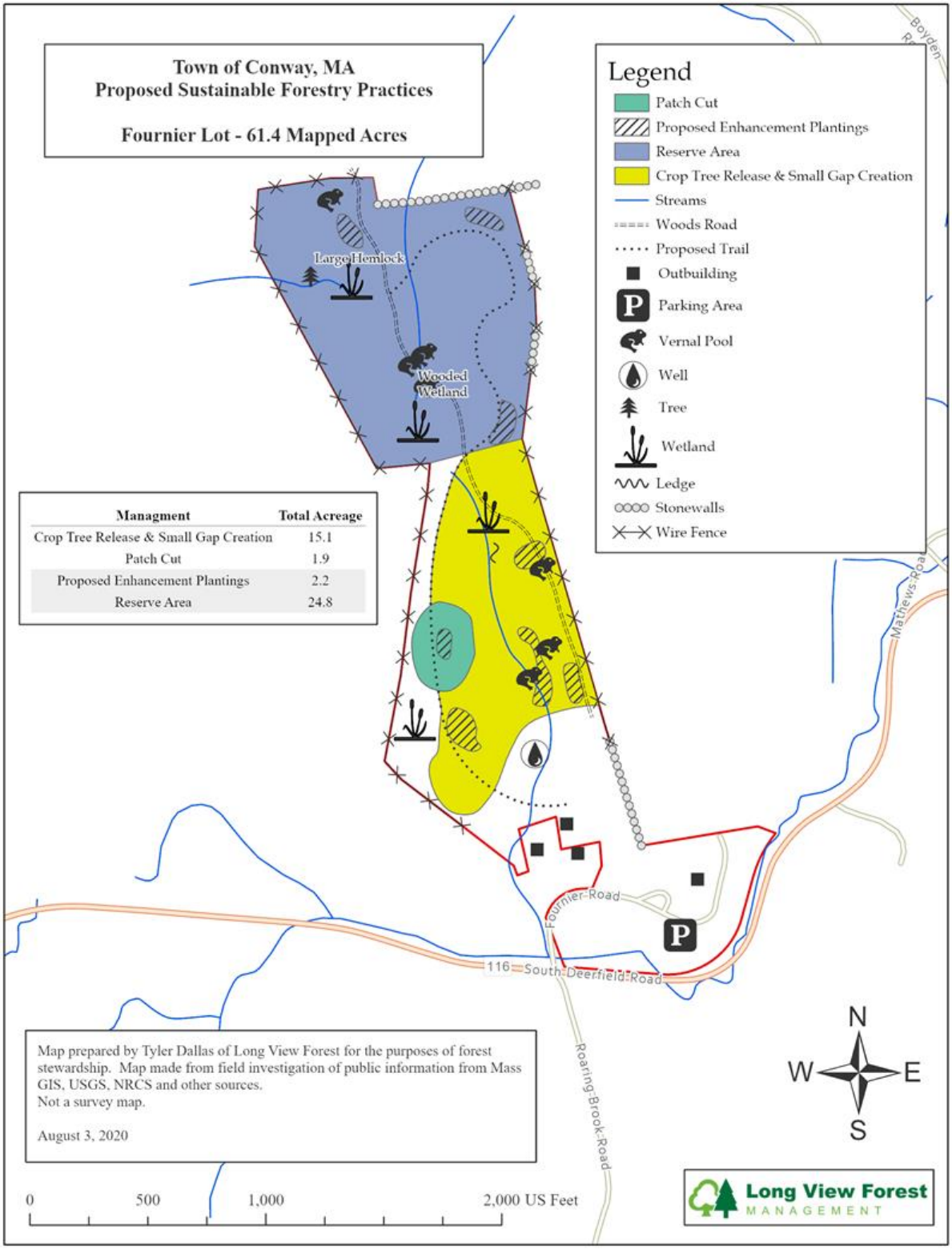


Figure 15: Proposed Forest Stewardship Activities

6.2 Sustainable Forestry Practices

Practice 1: Invasive Plant Control

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Biodiversity. Forest Resilience.	1 2	WK HH	Invasive Plant Control Measures	~0.25 acres of thicker infestation and ~10 acres of noticeably light infestations	2020-2025

Project Specifications: Integrative Vegetation Management (**IVM**) will be employed, through which each site will be reviewed, and decisions made for the application of safe, cost-effective, and environmentally sound methods of control. The invasive plant communities are not extensive yet; manual methods will be effective with sufficient community assistance, willing hands, and committed resources.

Mechanics of Practice: Manual removal is expensive and time consuming but offers an environmentally safe method of invasive plant control. Hand pulling or grubbing is often the quickest and easiest way to halt invaders when first spotted. However, roots that break off during extraction will sometimes re-sprout. Manual removal can also cause unwanted soil disturbance which can result in conditions favorable to invasive plant reinvasion. Frequent visits over the course of several years are often necessary for success with manual control**.**

One form of manual removal uses digging tools. Digging tools rely on either operator weight or strength to uproot non-native plants from the ground. Some brand names include the Weed Wrench™ Honeysuckle Popper™, Root Talon™, and Extractigator™ or a Mattocks. Mattocks are the tool of choice when manual control is required. A mattock with an ax on one end of the cutting tool and the digging tool on the other is preferred over a pickax when controlling invasive plant species. For species that readily re-sprout from the roots, the entire root system should be removed. Sometimes it is only necessary to remove the crown and any rooted vine nodules.

Hand Clippers and Loppers Hand clippers and loppers are required when mechanically controlling climbing vines or small multi-stemmed woody species. Always follow the vine or stem to the point where it emerges from the ground. If you

are unable to unearth the stem, cut as closely to the ground as possible and remove debris. To effectively control most non-native species, it is necessary to apply an appropriate herbicide to the wound. When this is not an option, it will be necessary to repeatedly cut when re-sprouts appear until there is no regrowth.

Target Species and Stocking Densities: There is a small pocket of Phragmites along the trail and widely distributed, very sparse populations of barberry and honeysuckle throughout the property. In the western part of Stand 1, some bittersweet vines are establishing. Luckily, these are all small and controllable populations. However, they are difficult to find due to their scattered presence. Control workers will need to carefully grid most of the property.

Stewardship Discussions: Small Towns operate on a tight budgets and shortfalls to revenues are expected for western Massachusetts in the coming years. Conway might commit financial resources to the provision of ecosystem services. Further public outreach initiatives can discuss the invasive species problem. Perhaps residents will motivate and participate in a volunteer program for simple manual removals of some of the plants. Grant funding from both Federal and State programs will be sought for assistance with this effort.

Community Outreach: An educational outreach process would inform the community about the invasive species projects. A brochure could be published and available through the Town offices, educational bulletins could be posted on the Town website, and field tours could demonstrate the plant species, removal techniques, and native plant communities. Education might inspire community members to volunteer at an ecological restoration day or contributions to any fund-raising campaigns for this work. Community education also prevents misunderstandings about the plant removal activities.

Practice 2: Young Forest Enhancement

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Biodiversity. Forest Resilience. Climate Mitigation. Carbon Accumulation. Forest Vigor and Regeneration.	1	WK	Enhance Young Forest Habitat with the creation of a small patch opening or expansion of an existing gap in a xeric upland region	1-2 acres	2025+

Discussion:

1. Designate a site with low forest stocking and diseased or high-risk trees of all sizes. These tees would be girdled in place or dropped to the ground and retained on site. Opening the forest floor in this manner encourages seed germination and seedling development of the native species present in the overstory.
2. Placement of the opening near large crowned, healthy seed-bearers like oaks, birches, beech, maples, and pine increases the chances of a good seed catch.
3. Retention of the coarse and fine woody material in the trees supports substrate development and snail feed. Wood thrushes enjoy high-calcium snail shells, and more feed will increase their numbers. Eastern towhee also requires high invertebrate populations that thrive in and around rotting logs.
4. Designation of the patch in an area with low native shrub stocking allows for the possibility of planting some native fruiting shrubs for increased late fall feed pre-migration for songbirds. This project could involve the community or school children.

Trees for Removal: Diseased beech stems, hemlock with wooly adelgid, trees with broken trunks or damaged crowns. This is not a commercial project; the material would remain in the woods and some would be piled for habitat use.

Practice 3: Understory Planting

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Biodiversity. Forest Resilience. Ecological function-Hydrologic cycle.	1 2	WK HH	Plant a wide array of native understory plants to increase wildlife food sources and increase property-wide biodiversity-focus in riparian zones and poorly stocked xeric uplands.	Opportunistically-property wide	2025+

Discussion:

1. Consider a wide array of native shrubs here such as holly, high bush blueberry, maple-leaved viburnum, hobblebush, spicebush, pepperbush, shad, and witch hazel.
2. Birds will key in on these plants and their presence enhances biodiversity.
3. As stated above, this project could involve the community or school children- led either by a professional services company or a knowledgeable and motivated community member.
4. United States Department of Agriculture Soil Conservation Districts can often help with plant procurement and the State of New Hampshire Nursey also has a great selection of seedlings available each spring. Community donations could also be sought from Franklin County nurseries or businesses.

Practice 4: Trail Development and Maintenance

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Ecological goods and benefits-solace, education, enjoyment, recreation. Ecological function-Soil quality and function. Cultural values.	1 2	WK HH	Trail Development and Maintenance and general Access Development and signage	2,000 linear feet	2020-2022+

Trail Development and Maintenance Discussion:

1. Mapping of the existing trial system and new or proposed routes. Publication of a revised Town trail maps and their connections to broader trail networks.
2. If Town consensus advocates for this practice, the development of a new trail connector loop (that winds through the eastern portion of the property from the northern tip, crosses the main access trial, and winds through the south western portion of the property terminating near the ice pond), lay-out the proposed trail route for approval by site users, construct a narrow, hiking path along the route with necessary erosion control measures built into the trail course. It is important that the location avoid Priority Habitat Zones for Species of Conservation Concern and sensitive wet soils during the trail lay-out and construction.
3. With the guidance of the community or perhaps from a Conway Trails Committee (we strongly recommend forming such a Committee), construct trailhead kiosks or simple box-slot for maps and install color-coded, directional signs on the trail network. Given community feedback, keep the signage discrete.
4. Conduct and document current rail condition assessment and develop a maintenance plan and protocol. Relying on the community interest in the care of these woods for seasonal community trail work volunteer days.
5. Seasonally monitor the trail conditions and when appropriate, do maintenance for sustainability of trail surfaces and network.
6. Parking can be gained from the school parking areas. A permanent entrance route could be determined in cooperation with the Town Highway Department so that no further development at the Town facility would disturb this access point.
7. Work with the School to potentially develop educational signage and/or curriculum based around the amazing features in these woods. A simple, interpretive trail with a guide could be laid out and integrated into the school's program.
8. This work would adhere to a community wide set of standards for the use of equipment, hand tools, and human resources within sensitive reserve zones (RTE's habitats).

Practice 5: Reserve and Proforestation Area

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Biodiversity. Climate Mitigation. Carbon Storage. Ecological goods and services- solace, nature study. Forest Resilience.	1 2	WK HH	Designate and Map a Refugia/Reference Forest/Pro-forestation Zone within this property	~25 acres	2020-2021

Definition: Proforestation is the practice of purposefully growing an existing forest intact toward its full ecological potential. It is a nature-based solution whereby existing forests are protected as intact ecosystems to foster continuous growth for maximal carbon storage and ecological and structural complexity. In suitable forested areas, it is a powerful and immediate forest-based strategy that can help address the global crises in climate and biodiversity.

Discussion:

1. A portion of the community would like to see both Town forests un-disturbed by future timber harvesting and management activities. This voice is important and presents a valid position given the forest's ability to mitigate climate change across the landscape.
2. Furthermore, the hemlock-hardwood grove in the northern tip of the property supports a unique wetland system and offers a potentially good site for study of the natural development of a hemlock and mixed hardwood grove through our changing climate. The sections of Stand 1 (WK) that surround the vernal pools, their interconnecting water courses, the Priority Habitat Zones for Protected, Rare, and Endangered Species, which were defined during the last harvest disturbance by the Natural heritage and Endangered Species Program, and the ice pond area will also be set aside as reserve zones with long-term protection from anthropogenic disturbance.
3. If the Town participates in any climate mitigation or carbon storage programs in the future, these protected areas will provide carbon reserves with high carbon stocks.
4. Long term protection as a reference forest in relatively undisturbed conditions from now moving forward would provide a useful comparison to other

managed areas while at the same time recognizing and celebrating the values that some community members hold. Afterall, this is everyone's forest.

5. However, the Town would also need to establish guidelines for what types of emergency interventions would be permitted in this zone.
6. This proposed reference forest would be a place where natural processes such as carbon sequestration and storage, would develop without human intervention from the moment of designation forward- fully recognizing that the complex anthropogenic land-use history from native peoples up to the present time obviously impacts this trajectory.
7. Given the uncertainties and unknowns around above-and belowground forest carbon dynamics, having a reference forest paired next to a more managed forest would allow both layperson observation of differences as well as scientific study of change over time.

Optional Passive Approach for the Fournier Property: Two letters were received through the community outreach component of this document preparation phase that requested that the Town consider the designation of all the Conway forest lands as reserve zones without any harvest related disturbance. Support for trail building and maintenance and invasive plant control indicates a reluctance by these parties to promote true non-disturbance zones.

It is beyond the mandate of this document to resolve this philosophical debate within Conway. A total passive approach to this entire property is certainly an option for review and debate in the future. This discussion should include the concepts of the increase in forest structure vulnerability and the decrease in forest resilience within a forest ecosystem that supports an overstocking of maturing trees as they face disease, insects, climate changes, and severe storm damage.

Practice 6: Conway-Specific BMPs

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Ecological function- Hydrologic cycle and Soil Quality and Function.	1 2	WK HH	Develop a set of Town-specific Best Management Practices	Property-wide	2020-2023

Discussion:

1. Survey results and public comments indicate that the community shares a concern for the protection of water resources and soil integrity during the implementation of any sustainable forestry practices on the Town forests.
2. The Massachusetts Department of Conservation and Recreation has a set of BMPs for use when silviculture project occurs. The Massachusetts 2014 BMP Manual lists minimal requirements for statutory compliance and more protective suggested practices for the protection of water and soil. If silviculture is initiated on the Fournier Lot, both the minimal and the additional precautionary suggested practices will be followed.
3. Written guidelines or at least a discussion of appropriate BMPs for the protection of water quality, soil integrity, rare, endangered, and protected species zones, the aesthetic appeal of the land, or unique cultural sites (ice pond) are advisable for use during any future sustainable forestry practice inclusive of trail development or maintenance projects, invasive plant control projects, storm damage clean-up projects, and silviculture harvesting projects.
4. Concern was presented about machinery use for any sustainable forestry practice in these woods. Heavy equipment used on sensitive ground or under inappropriate conditions can change the landscape and soil function for a long time. This community process of standards documentation could consider a mandate for types of harvesting equipment permitted on the Town forests, scheduling constraints, and harvest protocol that supports minimal impact.
5. This work might also address a policy for the oversight of equipment use on Town forest lands for the completion of any sustainable forestry practices. Weather it is accomplished via a detailed contract with any contractors that are privileged to work these lands or through a private consultant or Town official, language that conveys the needs of the community and the rigor of the Town-wide BMP's must be used.
6. This process could be undertaken by a Town Forestry Committee or Advisory Board. It would require some research into existing BMP's and education of the Select Board, and Forest Advisory Board or Committee about standards, equipment familiarity, and general forest engineering ideas.
7. Discussions included the possibility of a forestry by-law for Conway. No clear resolution was made about the process for the establishment of a set of BMP's for the community. Our recommendations include the completion of this work by some community-wide mechanism. Its priority in discussions, survey, and the workshops merits the consideration of the application for grant funding for the support of this work.

8. This process should also consider standards for the protection of culverts and commonly used roadways during any sustainable forestry practice that involves the use of equipment across these structures.

Practice 7: Optional-Focus Tree Release

*Presented as an Optional Active Forest Management Project for the support of forest health, individual tree vigor, and the establishment of additionality for any possible participation in a carbon sequestration program by Conway.

Objective	Stand No.	Forest Type	Sustainable Forestry Practice: Silvicultural Practice	Stand Area (acres)	Basal Area Removal (sq.ft.)	Volume Removal (MBF)	Fire-wood Removal (Cords)	Pulp-wood Removal (Cords)	Timing
Biodiversity Forest Resilience. Carbon pooling. Climate Mitigation. Forest and Tree Productivity Regenera-tion.	1	WK	Focus Tree Release	25 acres	<30 Sq. Ft. 10-15% of stocking.	80 MBF	25 cords	90 tons	2025-2030

Sustainable Forestry Practice Objectives:

1. Increase structural complexity amongst age classes, species composition, and tree heights.
2. Improve the general health and vigor of the legacy/focus trees. Legacy or focus trees here are defined as trees important to the Town for achieving its long-term stewardship goals. These goals include:
    a. Preserving and favoring a diversity of tree species and hence seed sources. For example, identifying an underrepresented species like white oak or aspen and partially freeing these trees from nearby competition.
    b. Enhancing specific trees' access to resources so they can grow better to provide wildlife values such as acorns, fruits, and dwelling sites. For example, a disease-free beech tree (nut production) or a black oak tree (fruit) could be given more light.
    c. Enhancing and managing growth for carbon accumulation and storage. For example, favoring the growth of vigorous black birch poles to make a better balanced and less-risky carbon portfolio- black birch is expected to

do well under climate change scenarios and regenerates well under forest-wide deer-browse pressure.

3. Enhance and protect songbird habitat attributes for maturing interior forests with dense canopy cover (>80% crown cover post-harvest). The proposed harvest removal levels are minimal, which retains stand dynamics, ecosystem function, and natural resiliency inherent to a densely stocked, maturing forest.
4. Preserve mostly dense forest cover for maximum carbon storage in maturing trees.
5. Legacy or focus trees may be retained in the stand for their lifetime or removed in the future due to designation of a high-risk tree with insects, disease, or its proximity to a higher priority legacy/focus tree.

Mechanics of the Harvest for Focus Tree Release:

1. Retain dense thickets of native shrubs and tree saplings during operations. Black-throated blue warblers and black-throated green warblers love caterpillars, which can be gleaned from these dense young patches. Many songbirds use the dense lower cover for breeding and nesting.
2. Legacy or focus tree release mechanics aim to open the crowns on two to three sides of the chosen trees in the stand. A minimum of 25-30 legacy or focus trees will be selected per acre. Trees would be removed from 1-3 sides of these legacy/focus trees, and trees with no influence on legacy/focus tree crown or growth would still grow. It would be a conservative harvest.
3. Scheduling of this proposed project should reflect commitment to carbon friendly and ecological forestry in which disturbances are spaced out over a 20-year window for sufficient recovery of the forest ecosystem between these disturbances. The conservative removals (remember the total stocking and volume records for this site are extremely high due to the tree size and heights) adhere to the maximization of carbon storage premises of retention of high stocking post-harvest.
4. The proposed silviculture project would follow the Ecological Forestry precepts as summarized in Appendix B of this document.
5. The trail network would be protected with the strategic retention of aesthetically pleasing trees, a buffer strip along the trails, and the removal of any brush from this trail surface at the end of operations. Brush piles could be made to be nesting sites, or to provide cover to small mammals.

Trees to Be Removed: Sawtimber-sized white pine and hemlock stems and large sapling and pole-sized red maple, beech, hemlock, and paper birch stems, trees with poor form, low vigor, and a juxtaposition that interferes with crown expansion of the crop trees in the stand. An estimated 10-20% of the site stocking will be harvested. White pine trees for removal would include those with root heaving, asymmetrical

crowns, and extensive needle dropping caused by fungi. Hemlock trees that shed over ~75 % of their needles over the next five years would be included.

Legacy or Focus Trees: See Objective 2 above. Here, we expand the more traditional definition of crop trees to include yellow birch, beech, black oak, white oak, white ash, shad, and black cherry (soft mast), as well as any species with well-formed cavities or large, expansive, healthy crowns for perching, and large-diameter snag trees. Crop trees for either enhanced carbon storage or timber production include stems that adhere to the conventional wisdom of a superior phenotype and genotype timber bole, clean of branching defects, straight, non-tapering, windfirm, low upper crown decline with dead branches, and full, healthy crown.

Stewardship Concerns of the Select Board Conway August 2020: It was suggested that a reason be identified for the harvest of any tree, let alone hundreds, on Town forest lands. If the proposed silviculture project is approved within the community in the future, a site review could accompany any project documents that specifies the detailed criteria for choice of trees for removal. Any tree proposed for harvest would be taken in support of the stated goals outlined in this Forest Stewardship Management Plan.

Landscape Considerations: Forest management approaches on neighboring private, industrial, and State-owned forest lands differ from this proposed silviculture project. This Legacy or Focus Tree Release is a conservative technique which removes a minimal number of trees per acre, retains maturing, large sized trees for their life cycle, minimizes disturbance to ecosystem function, and supports a quick return to pre-disturbance condition and structure.

In contrast, other forestry projects, which are driven by a different set of goals and objectives than your communities, remove higher levels of stocking, harvest more and retain less mature trees, and create large openings in the forest landscape for habitat values. If the community supports this proposed practice, it will not detract from the use of the Town forests as a carbon sink and the Town's participation in any possible carbon credit offset project.

Invasive Plant Control: Invasive plants are inching into this stand along the main road and from adjacent agricultural areas along the southwestern section of the property line. Appropriate manual control measures as outlined above can be scheduled prior to any silviculture disturbance.

Practice 8: Forest Carbon

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Climate Mitigation. Carbon storage and accumulation. Forest Resilience. Ecological goods-economic goods.	1 2	WK HH	Completion of a Carbon Inventory Process and Verification of the Carbon Credit Equivalents within the organic components of this forest ecosystem and The Development of a long-range, detailed Climate Mitigation Strategy	Property - wide	2020-2030

Discussion:

1. Accurate estimates of carbon in forests are crucial for forest carbon management, carbon credit trading, national reporting of greenhouse gas inventories to the United Nations Framework Convention for Climate Change, calculating estimates for the Montreal Process criteria and indicators for sustainable forest management and registering forest-related activities for state and regional greenhouse gas registries and programs. While the inventory we performed to write this plan is rigorous and useful as a baseline, it does not meet the standards of a carbon inventory.
2. The Commonwealth and its Executive Office of Energy and Environment are exploring the use of carbon marketing program for incentivizing the use of our valuable forests in western Massachusetts as a climate mitigation tool. When this program is launched, the Town might consider the development of a carbon program within their Town forests.
3. The United States Forest Service offers technical assistance with the establishment of carbon friendly forestry practices (much like the ideas presented in this document) on municipal and community forest land. It may be helpful if the Town considered participating in a study or project with the United States Forest Service Northern Institute of Applied Climate Sciences case study on the Town forests. This process would provide detail about the condition of the Town

forests with respect to surviving and thriving under different climate change scenarios into the future.

4. The Town has applied for grant funding from the FRCOG-Mohawk Trail Woodlands Partnership for the completion of a feasibility study for the initiation of a carbon sequestration and credit generation project for the Town forests in aggregation with surrounding municipal and private forest lands. The ideas, goals and objectives sustainable forestry practices presented in this document integrate well with participation in such a program.

Practice 9: Boundaries and Signage

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Ecosystem goods and services-cultural and social values.	1 2	WK HH	Boundary Delineation and Signage	Property - wide	2020-2030

Discussion: The placement of small discrete signs that welcome hikers onto the Town Forest from the interconnecting trail system and protect Town lands from unwanted use or activities. It's a good neighbor policy to establish and mark your boundaries.

Practice 10 Grade School Educational Programs

Objective	Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
Support social, cultural, and educational values of the forest ecosystem	1 2	WK HH	Development and Promotion of an educational program for use of the forest ecosystem in the Conway Grammar School	Property-wide	2020-2030

Discussion: The proximity of this valuable resource to the school facilitates the inclusion of natural history, forest ecosystem function, habitat attributes, protection of sensitive species, biodiversity, and climate mitigation by trees, and general environmental science lessons into the curriculum. The school has used the site in the past, and the Principal expressed an interest in future use. Project Learning Tree

distributes curriculum templates, online educational materials, and classroom posters and material for use in teaching students about the forest ecosystem. PLT offers free teacher training for school staff to learn how to use this curriculum and inspire student interest.

The Town and school could decide the direction of the education process for their children and the concepts and ideas that should be promoted. It is recommended that the concepts of sustainable forest management be included in the educational efforts. Conway is a farming community, and students might benefit from an appreciation of forestry techniques and their benefits to the forest ecosystem. Several ideas were proposed about nature classroom ideas inclusive of the set-up of a camera for observation of the vernal pool habitat development in early spring, general camera images of wildlife using these woods, or the establishment of some sampling plots for the students to conduct tree measurements for ether volume of carbon tonnage.

Practice 11: Practice Adaptive Management

Stand Number	Forest Type	Sustainable Forestry Practice	Extent	Timing
1 2	WK HH	Development of a Monitoring Program and Documentation or Archive System	Property -wide	2020-2030

Discussion:

1. As discussed throughout this Plan, change is an inevitable part of natural processes. The forest will evolve through the next ten years, and our climate changes. One can wisely guess, but not completely understand today what threats or challenges this forest ecosystem will face though this period. The establishment of a record keeping system to archive the forests' current condition (this document could serve as your baseline description of the forest and its functionality in 2020) and the changes that occur with each growing season and weather cycles provides the Town with the flexibility necessary to work on solutions if problems arise.
2. This responsibility could be hired out to a forester, a botanist, an environmental consultant or taken on by a community-derived Town Forest Committee (keeping in mind the experience and wisdom of the

Conway participants in the Forest Stewardship Planning process) or some derivative of this concept.

3. Good record keeping and documentation will also position the Town to take advantage of any carbon sequestration, climate mitigation, or carbon credit marketing programs that arise during the coming years. Your Town invested the initial resources to complete this Forest Stewardship Management Plan, and you can easily leverage the data, ideas, and stewardship issues presented here for future program development.
4. Monitoring hemlock will be an important task over the course of this Plan. Keeping an eye out for thin crowns, dying trees, and regionwide reporting on winter Hemlock Wooly Adelgid mortality rates will help inform this effort.

6.9 Community-based Forest Stewardship and Budgeting Planning

The Town of Conway wishes to be directly involved with any decision relating to the stewardship of their forests and the use of any sustainable forestry practices upon them. Perhaps the most important thing the Townspeople would like is to be fully informed in a timely fashion whenever forest management work is proposed or planned. As mentioned earlier in this document, one way to assure full disclosure or any discussions relating to the Town forests would be the creation of a formal political body within the auspices of Town government and committees to conduct due diligence when necessary.

Such a body could convene when the implementation of any of the recommendations in this document are proposed. The Committee's responsibility would include the protection of the collective voice heard during this project. Small Towns face financial dilemmas in their annual budget season. Our current pandemic might enforce austerity measures for years. This body could stay current on grant funding opportunities (Federal and State as well as private foundations), complete applications, and supervise the direct supervision of the grant itself and all work on the Town forests or retain a third-party for such supervision and implementation.

Section 7: Signature Page

Check each box that applies

☐ CH. 61/61A Management Plan I attest that I am familiar with and will be bound by all applicable Federal, State, and Local environmental laws and /or rules and regulations of the Department of Conservation and Recreation. I further understand that if I convey all or any portion of this land during the period of classification, I am under obligation to notify the grantee(s) of all obligations of this plan which become his/hers to perform and will notify the Department of Conservation and Recreation of said change of ownership.

☒ Forest Stewardship Plan. When undertaking management activities, I pledge to abide by the management provisions of this Stewardship Management Plan during the ten-year period following approval. I understand that if I convey all or a portion of the land described in this plan during the period of the plan, I will notify the Department of Conservation and Recreation of this change in ownership.

☐ Green Certification. I pledge to abide by the FSC Northeast Regional Standards and MA private lands group certification for a period of five years. To be eligible for Green Certification you must also check the box below.

☐ Tax considerations. I attest that I am the registered owner of this property and have paid all applicable taxes, including outstanding balances, on this property.

Signed under the pains of perjury:

Owner(s)_____ _____Date_____

Owner(s)_____Date_____

I attest that I have prepared this plan in good faith to reflect the landowner's interest.
Plan Preparer: Mary K. Wigmore: MFL #250 Date

I attest that the plan satisfactorily meets the requirements of CH61/61A and/or the Forest Stewardship Program.

Approved, Service Forester Date_____

Approved, Regional Supervisor Date_____

In the event of a change of ownership of all or part of the property, the new owner must file an amended Ch. 61/61A **plan within 90 days from the transfer of title to insure continuation of** Ch. 61/61A **classification.**

Appendix A- Forest Stewardship Goals

The full set of forest stewardship goals, objectives and strategies using sustainable forestry practices for the Conway town forests, which were derived from the On-line Community Forest Stewardship Planning Survey and the Forest Stewardship Planning Workshop.

These are all the things that we heard the community say they wanted to do. It embarks from position of community engagement- knowing full well that the voices in the decision-making process may change at different times and in response to different values.

There were two general approaches that coalesced- one which tends towards a passive, hands-off approach to stewardship, and the other which tends toward a more active, hands-on approach. Here, we strive to present two tracks, which will undoubtedly often overlap, of possible stewardship practices.

The more passive approach is highlighted with grey in the central column where applicable.

COMMUNITY-BASED FOREST STEWARDSHIP GOALS	OBJECTIVES	SUSTAINABLE FORESTRY PRACTICES	Fiscal Year accomplished	Example of Ecosystem Service or Ecological/Social Function Outcome
1. Sustain biological richness defined as all forms of life within the forest and their ecological roles and the different ecosystems, landscapes, species, and genetic codes present here now.	**1.Preserve Habitat for rare and endangered species and species of conservation priority in natural condition.** **2.Maintain a full range of habitat conditions for the support of wildlife diversity.**	**A: Passive with Minimal Disturbance** **1.Identify priority habitat through GIS mapping** **2.Set policy for these areas of non-disturbance-BMP guidelines established for visiting and trail use in Conway Community Forests.**	**2021-2030**	**Sustain wildlife habitat in its natural condition** **Mapped and reserved refugia sites or long-term minimal**

	3.Protect native plant communities.	**3. Interpretative signs constructed and installed on the properties with a simple message of treading lightly and sharing the forest.** **4. Identify unique habitat refugia and legacy sites for protection, use GIS mapping for their designation, and establish a Town policy about the establishment of these micro-refuges upon the two Town forests with non-disturbance/forever wild zones understanding.** **5. Develop a long-term protection plan for the Town forests such as the sale of a conservation restriction or a Town initiative for no future development.** **6. Educate the neighborhood and Town about strategies to protect and enhance habitat.** **7. Protect Rare, Threatened and Endangered (RTEs) Species by strategically focusing recreational and educational access away from special areas.**		**management zones**

		B. <u>Active and Conservative Stewardship</u> **1.Identify full scope of the invasive plant threats on both Town forests. Use GPS and GIS mapping technologies to determine and map their extent on both forests.** **2.Develop an Integrated Vegetation Management Plan for the control of these invasive plants. The current stocking allows for manual and mechanical control measures with hand pulling, brush cutting, or mowing on the Fournier Woods, but Town Farm Forest may need other control measures.** **3. Promote Old Growth Stand Characteristics through the felling of large trees to create large sized downed woody material to support invertebrates and girdle large sized trees for snags and cavity nesting sites.** **4. Create additional wildlife habitat by installing a 1-2-acre openings in the remote uplands of the properties without the extraction of forest products.**	**1.2020-2021** **2. 2020-2021** **3.2020-2030** **4. 2020-through 2030** **5. Ongoing**	**Protect native habitat and plant communities and their ecological function**

		5. Plant native shrubs within forest areas that are deficient in this valuable plan layer for cover and feed. **6. (a) Explore full government grants, private foundation grants, forest goods based, and community resource for human power (volunteer programs) funding for the completion of these sustainable forestry practices.** **(b) Secure funding sources.** **(c)Implement these Sustainable Forestry Practices on the two Town forests.** **7. Protect RTEs by planning and timing SFP's around the requirements of known RTEs on the property.**	**6. Continual** **7. Ongoing**	
2. Sustain the ecological services and benefits provided to humans from these forests defined as:				
a. Social and emotional goods- support well-being, relaxation, spiritual sustenance, study of nature, and recreational opportunities	**1.Maintain and enhance the recreational experience of both forests.** **2. Develop and expand the educational use of the Fournier Woods by the Conway Grammar School**	**Can't be too passive here- if you don't do anything, trails deteriorate, and erosion occurs-community spoke and wants to use the land.** **1.Trail inventory of current trail locations and condition on the Town Forests.** **2.Identify needs for trail restoration and maintenance such as brushing out,**	**2020 through 2030**	**-Protect and enhance emotional and spiritual well-being of community** **-Sustain and protect water quality with**

		erosion prevention measure installations, closing trails if deteriorating beyond sustainable condition, and signage needs inclusive of best locations, minimal effective number, educational/interpretive, directional, and designation of trail use as some should be just for walking. **3. Develop a 10-year working plan for trail maintenance and upgrade when necessary.** **-Secure funding sources.** **4. Implement the recreational plan for the trail system** **-erosion control measures installed** **-appropriate signage installed** **-map of the system made and presented at a kiosk with rules of use** **-kiosk built with local wood and installed** **- designate locations of good viewsheds.** **5. Install educational signage to enhance peoples' experience of the place with a special focus on children's engagement with the woods here.** **(a) Assist local teachers in attendance to a Project Learning Tree seminar**		**erosion prevention** **-Sustain and Protect soil integrity** **-Promote Recreational Opportunities**

		(b) Apply for special grants if an interest teacher appears for the inclusion of forest ecosystem material in the curriculum. **(c) Revision of the Ruth Parnell Forest Treasure map for display at the forest and availability in a kiosk for family use.** **6. (a) Explore full government grants, private foundation grants, forest goods based, and community resource for human power (volunteer programs) funding for the recreational trail development and maintenance.** **(b) Secure funding.**		
b. Hydrologic cycle through which forests absorb water from soil and atmosphere and return it and filter it for its improved quality	**1. Protect and maintain the water quality in vernal pools, streams, spring seeps, riparian zones, and wetlands**	**If passive- then no forestry and no use in riparian zones but that only stops the respectful, civil folks from damaging these sensitive sites.** **Active Management:** **1.Draft and document a set of best management practices that use an acceptable set of standard practices for water quality protection during trail**		**-Protects and maintains high water quality within the wetland resources on these lands and downstream** **-Sustains ecological**

		work, forest stewardship projects, or silvicultural activity. **2.Map and identify riparian resources on both properties and display map on interpretive signage with directions to tread lightly.** **3.Follow all CMP's from Mass NHES Program for Vernal pools during any Sustainable Forestry Practices.**		**function of the forests** **-Sustains biological richness with preservation of water sources**
c. Soil quality and function as forest filter toxins before they enter the soils, anchor soils in place, support microbial and microorganism activity to build soils, which support all life	**1.Protect and restore soil integrity and structure**	**Passive- then no forestry and other disturbance in the riparian zones or on highly erodible sites, but that only stops the respectful folks from damaging these sites and protecting soil integrity** **Active Stewardship-one can argue recreational use of the trails on site falls within Active Stewardship parameters:** **1.Identify areas with soil degradation due to past harvesting or current welcome and unwelcome recreational use, map field locations of current and possible sensitive zones where site degradation could occur from use, and establish a GIS database on both properties inclusive of minor issues (ruts in woods, overuse trails, or sheet erosion on trails and major**		**-Protects and sustains long term soil integrity, fertility, and function on both forests** **-Sustains ecological function of the forests** **-Sustains biological richness with preservation of water sources**

		issues (failed or undersized culverts or massive sedimentation and erosion zones). **2.Draft or accept an already established set of best management practices with community input that determines how to us the trail system or implement SFP's and protect soils integrity.** **3. (a) Explore full government grants, private foundation grants, forest goods based, and community resource for human power (volunteer programs) funding for the completion of the above tasks when necessary.** **(b) Secure funding sources.** **4. During any future silvicultural SFP's for forest health, productivity, or resilience, make use of the Massachusetts 2014 BMP Manual and the additional Town policy and minimize road surfaces for work and restore disturbed soils surfaces.**		
d. Climate Regulation - protect and promote the forests' use as a Carbon sink that pulls CO2 out of the air in photosynthesis, accumulates and	**1. Promote forest conditions that support their use as a mitigation strategy for climate change through Carbon sinking/pooling and**	**1.Social/cultural- Before any active management starts- hold a community forum to accept the appropriate sustainable forestry practices necessary for the accomplishment of this goal. At**		**-Maintain forest condition for its use as mitigation strategy for climate change**

sequesters carbon and stores it in boles, leaves, branches, and roots thereby mitigating the threats of climate change	**promoting forest conditions that allow for climate adaptation by the forest**	**the forum present science to date and decide what the Town can accept.** **2. Active management- science has some guidelines on how to grow a forest for the optimal accumulation and storage of carbon and the adaptation of forest conditions for climate mitigation.** **(a) Identify the current forest conditions and characteristics useful to carbon pooling and supportive of future adaptation to a changing climate.** **(b) Set up a long-term SFP in a long rotation (time you grow trees on a property) and grow site and climate changing suitable trees older-closer to their lifespans.** **(c) Require long recovery periods between disturbance from forest stewardship/harvest with a required 20-year window. Both forests are in the recovery phase for another 5 to 8 years+/-** **(d) Establish a monitoring system on both forests so that you can see how the forest is doing as change occurs annually/biannually?** **(f) At end of recovery period use silvicultural practices to introduce a new young age class, improve forest stand and individual tree vigor, increase forest**		**-Protects and sustains biological richness** **-protects and sustains the delivery of ecological services** **-Increase forest productivity and its ability to sequester carbon**

		ecosystems productive capacity, and remove any threatened trees		
e. Economic goods- timber products and fuelwood are important to some community members, but overall, these are the lowest priority objectives	**1. Maintain and improve timber stocking where appropriate and where co-benefits of forest health and productivity accrue.** **2.Regenerate the forest when necessary**	**Pro-forestation – is a passive management approach whereby the Town lets the forests develop naturally from this point forward through time.** **1. Implementation of an acceptably low intensity harvest that meets all the ecosystem services and benefits goals- Crop Tree Release with small gaps creation between crop trees or Combination of Single Tree and Small Group Selection.** **2. Draft an aesthetic values protection land for use during implementation of SFPs** **3. Solicit community input and involvement in all the decisions about best use of silviculture on the Town forests.** **4.Hold educational field tours about the project goals and mechanics.**	**2028+**	**-Maintain and enhance forest health and vigor** **-Maintain forest condition for its use as mitigation strategy for climate change** **-Protects and sustains biological richness** **-protects and sustains the delivery of ecological services** **-Increase forest productivity and its ability to sequester carbon**
f. Cultural values-some of the history of Conway is held on these lands.	**1.Protect all historic and cultural resources across both forests**	**Combination of Active and Passive <u>required</u>** **1.Map the cultural resources.**		**-Protects and maintains the historic and**

		2. Create and follow a community policy for their protection. **3. Seek any funding for special protection measures- such as restoration of gravestones.** **4. Secure funding** **5. Implement any practical measures.**		**cultural values inherent on the Town forests** **-Protects and sustains the delivery of ecological services and benefits to humans**
Sustain Forest Resiliency	**1.Conserve and Protect the Forest Ecosystem itself against conversion of use** **2.Use SFP to increase and maintain forest resiliency**	**1.Establish a monitoring program that can assess future vulnerabilities to disturbance across both forests, change sin resilient characteristics, and threats to the forest ecosystem.** **2. Implement SFP's that promote long term forest resiliency** **(a) Passive-Let the forest grows and naturally develop resiliency. Depends on the premise that forests have the genetic history and adaptiveness to survive.** **(b) Implement many of the above stated SFP's which are scientifically accepted, and community accepted and will increase forest resilience:** **b.1. Similar SFP's for climate mitigation.** **b.2. Create balance in age classes across the forest.**		**-Sustain Forest Resilience** **-Maintain and enhance forest health and vigor** **-Maintain forest condition for its use as mitigation strategy for climate change** **-Protects and sustains biological richness** **-protects and sustains the delivery of ecological services**

		b.3.improve the health and vigor of the trees in both forests. **b.4. Use an adaptive management program for frequent review of resilient conditions and adaptation of necessary measures to protect FR.** **6.Educate the community about forest resilience.**		**-Increase forest productivity and its ability to sequester C**

Appendix B: Ecological Forestry

The use of Ecological Forestry (EF) principles strivers to maintain the ecological processes of water filtration, carbon storage and biodiversity protection within a forest ecosystem. Ecological Forestry is a silvicultural philosophy that perpetuates forest ecosystem integrity at a landscape spatial scale while continuing to provide the full suite of ecological goods and services as discussed previously in the Forest Stewardship Management Plan. It is an appropriate silvicultural tool to meet the integrated goals of management on the Conway Town Forests. Ecological Forestry depends upon the continuity of the forest structure, function, and biotic communities before and after any harvest disturbance to the ecosystem. If your community accepts a silvicultural harvest, it is planned and executed to mimic natural disturbances. Therefore, these projects follow a wide gradient of size/shape from the individual tree to small patches/gaps to entire stands.

Each disturbance frees up growing space in the forest yet retains many of the elements of the original forest such as standing dead cull trees and legacy mature stems. Structural and compositional complexity is preserved or created during any disturbance. On the Fournier Forest, there is already a complex mosaic of species, size classes, and natural features. However, it is largely a young, to middle aged forest and management here can seek to guide portions of the woods toward and older forest condition replete with the structural complexity and messiness that this generally entails. The proposed reserve area (See Practices Map) will grow undisturbed towards biological maturity, some individual trees within stands will mature, and some sites will mimic larger scale disturbance for the creation of young forest. This process blends the preservation of refugia sites and mature forests, regeneration harvests, variable density thinning, and crown thinning for the improvement of individual tree and stand vigor, habitat, carbon reserves, and biodiversity.

Longer rotation ages (in excess of 200 to 250 years) for the best site-suited tree species and longer periods between harvest disturbances (cutting cycles set to 20 to 25 years) allow for the development of the desired structural complexity within an area post disturbance. The community plans and executes a disturbance regime schedule after a thorough identification and mapping of all the environmentally or culturally sensitive zones upon the watershed. With this approach critical resource sites such as functional riparian zones or seep collection fonts or culturally important structures such as stone walls and cellar holes are located and protected. Longer rotations also accommodate species specific adaptations amongst the forest to climate change.

The following seven elements guide the field application of ecological forestry practices:

1) forests have intrinsic value,
2) humans need to extract products from the forest,
3) silviculture should follow natural processes as much as possible,
4) foresters should plan for the long term,
5) forestry is implemented at the stand scale but must be in balance with the larger ecosystem,
6) the social and economic context matters, and
7) science and place-based experience should guide silviculture.

These guidelines would form, if necessary, the silvicultural tenets that guide prescriptions for the stewardship of the Town forests.

The next discussion states the harvest standards and guidelines necessary for the protection of the ecological function

Forest Management Standards for the Silvicultural Application of Ecological Forestry on Conway Town forests

Goal: Use of silvicultural-based timber harvesting within the EF context for the maintenance and development of an all-aged, species rich, structurally complex, biodiverse, natural filtration watershed forest.

Standards or Practice:
1. Apply current and generally accepted scientific principles from the 2014 Massachusetts Best Management Practices manual to conserve soil and water quality across the managed sections of the watershed forest.

2. Apply current and generally accepted Ecological Forestry silviculture principles for native biodiversity protection as a standard for the managed sections of the watershed forest.

3. Establish long term (200 to 250 year) rotations (time necessary to produce the desirable management crop on the watershed) and establish 15 to 20 year intervals between harvest disturbances within any give management unit on the watershed forest unless more frequent entries are necessary for salvage due to pathogen damage or regeneration purposes.

4. Prevent the movement of sediments into the riparian zones and its riparian corridor of seeps, streams, wetlands, and swamps during any silvicultural harvest work.

Conduct all silviculture harvests under an approved Massachusetts Chapter 132 Harvest Cutting plan and in full compliance with Massachusetts Chapter 131 The Wetlands Protection Act.

5. Establish and maintain all access/truck roads, skid roads, and landings areas in compliance with both the required and recommended best management practice guideline in the 2014 BMP Manual.

6. Avoid wetland area crossings during any harvest operation, establish and maintain appropriate stream crossings for logging machinery and operate the machinery within these crossing areas in strict compliance with both the required and recommended best management practice guidelines in the 2014 BMP Manual.

7. Locate and map all vernal pools within designated harvest areas and plan the harvest with strict compliance with all the required and recommended best management practices guidelines in the 2014 BMP Manual for vernal pools.

8. Establish ~50-foot filter strips around all designated and mapped riparian zones across the Forests, which are zones essential to the collection and movement of groundwater across the forest ecosystem and into the riparian zones. Restriction of any harvest or entrance into the riparian zones or their 50-foot filter strips.

9. Conduct annual interior service road inspections and conduct annual maintenance of the culvert system and periodic erosion control measure installations along this road system to prevent roadbed degradation and the potential for increased erosion and runoff along these road networks.

10. Survey the property (ideally in early spring) and identify in finer detail the Important hydrologic features of a proposed harvest site and mitigate for water quality. Protect surface waters and wetlands by appropriately locating roads before harvesting begins and applying other all BMPs.

11. When logging in and near the forested wetlands, avoid rutting and other damage by cutting when the ground is frozen or sufficiently dry to support the type of equipment used.

12. Before harvesting within or near rare or highly sensitive wetlands, consult with the Massachusetts NHESP for their most recent Conservation Management Practices for site protection during harvest work and these CMP's would be implemented.

13. Comply with all Conservation Management Practices if necessary, from the Massachusetts Natural Heritage and Endangered Species Program for the protection of

any state listed and priority natural communities identified within the managed sections of the watershed forest.

14. Designate a wetland buffer adjacent to forested and non-forested wetlands. A buffer's effectiveness increases with its width. Sensitive wetlands require larger areas of upland to reduce the risk of disturbance.

15. Designate no-disturbance zones inclusive of steep slopes, highly erodible soils, known threatened and endangered species habitat, rare plants and exemplary natural communities, or nests.

16. Leave the area closest to the stream, pond, or wetland un-harvested to provide increased protection to aquatic habitats and allow a reliable long-term supply of cavity trees, snags, and downed woody material. Larger zones will increase the protection of non-timber values; however, no-harvest zones may not always align with ecological or silvicultural objectives.

17. Retain trees with cavities, standing dead trees, downed logs, and large superior canopy trees.

18. Maintain the boundaries of the Forests for protection against trespass and illegal uses of the site.

19. Implement strategies for invasive plant control across the Town Forests.

20. Everywhere, apply appropriate methodologies matched to site specific conditions for the protection of biodiversity.