



NEW ENGLAND
FORESTRY
FOUNDATION

GUIDE TO SUSTAINABLE FOREST MANAGEMENT

If you are a supporter of New England Forestry Foundation (NEFF), a visitor to our Community Forests, a forest landowner, a forester, or someone involved in forest policy, we would like to provide you with a deeper look into how NEFF practices forestry. This document covers a lot of ground, but it is not a comprehensive look at all aspects of our work. If you would like to learn more, we have included additional resources in the final section.

This document will first provide background information and the history of NEFF, and then guide you through the management of NEFF's Community Forests. It covers:

- Guiding Principles
- Forestry Goals
- Exemplary Forestry: NEFF's Standards and Measurable Outcomes
- Silvicultural Systems
- General Land Management Policies
- Administrative Procedures and Public Documentation
- Additional Resources

Background and History

The New England Forestry Foundation was founded in 1944, and has been dedicated ever since to the conservation and ecologically sound management of privately owned forestlands in New England. At the time of NEFF's founding, the region was suffering from poor harvesting practices and a lack of good management planning. Today, NEFF is a recognized leader in sustainable forest management, conservation, forestry education, and helping landowners ensure long-term protection and management of their properties.

The forests of New England have long provided their inhabitants with the resources to succeed in the region, but early European settlers exploited local timber and wildlife, sending ship masts and beaver pelts back across the ocean while clearing large swaths of forestland to make way for agriculture. By 1880, up to 80 percent of land across much of New England had been cleared, but conservation efforts and responsible forestry have contributed to the partial re-greening of the region.

Though challenges to our forests remain, this ongoing recovery means New England's forests are able to provide for today's society in a variety of ways. When managed well, forests offer wood products to build and heat our homes, habitat for all manner of wildlife, clean water to drink, clean air to breathe, and a host of opportunities for people to enjoy the natural world.

Forests are integral to New England's character and quality of life, but many are not currently managed using fundamental principles of silviculture—the science of growing and regenerating trees. Practicing science-driven sustainable forestry protects future generations' ability to realize the same benefits from our forests that we enjoy today.

NEFF envisions a future where forests remain New England's dominant land feature; where forest health is maintained and improved through sustainable management and timber harvesting practices; where forestry is recognized for the benefits it provides to society; and where forests are highly valued for their capacity to provide manifold environmental, social and economic benefits, and for their ability to help mitigate climate change.

Organizational History

NEFF has helped protect forestland since its inception, but in our first fifty years, much of our focus was on helping landowners sustain healthy forest environments by offering high-quality forest management consulting services. These efforts helped establish the profession of consulting forestry, and we eventually spun off our foresters as a private for-profit entity.

During the last 20 years, continued urban sprawl has led to forest fragmentation and declines in forest cover in all six New England states. In response, we have proactively increased our land conservation activities while still conducting outreach and education programs about sustainable forest management.

Our pioneering approaches have enabled us to conserve more forested acres than any other private organization in New England, and during the last 15 years, NEFF has protected one out of every three acres conserved in the region. We have a record of success in Maine, a reputation for innovative conservation solutions, and success in raising tens of millions of private and public dollars. Today we hold conservation easements on 145 parcels covering more than 1,147,000 acres. We also own 143 Community Forests comprising more than 27,000 acres in five states; they are all green-certified according to Forest Stewardship Council and/or American Tree Farm System standards and are open to the public at no charge.

One of NEFF's most notable land-conservation accomplishments is the acquisition of the Pingree Forest easement (>762,000 acres) in northern and western Maine—the largest forestland easement in the U.S.—and the Sunrise easement (312,000 acres) in eastern Maine. Despite NEFF's decades of experience with forestland conservation, these immense projects presented unusual challenges and opportunities. In the end, we gained national recognition for several aspects of our work, including our collaboration with University of Maine researchers to develop new methodology for monitoring large forested landscapes. Not all NEFF land conservation projects are so large in scale, and this diversity demonstrates our versatility.

In 2012, NEFF's Board formally adopted Harvard Forest's Wildlands and Woodlands vision, which calls for protecting 30 million acres of forestland, with three million acres set aside as wild forests and 27 million acres of productive managed forests. NEFF's 27,000 acres of Community Forests and 1.1 million acres of forest held under conservation easements contribute to that overall vision.

Current NEFF projects that support this vision include landscape-scale conservation efforts in the Mountains of the Dawn area of western Maine, central New Hampshire, and western Massachusetts, as well as the recent publication of [New England Forests: The Path to Sustainability](#). This NEFF report assesses future potential benefits of the region's forests in the face of climate change and other challenges.

Forestry's Role in Maintaining Forests

Forests are self-sufficient and do not require human intervention for their existence and continuation. Humans, on the other hand, rely on forests for a variety of societal and personal needs. Human existence would be much more difficult and less enjoyable without forests in our world, and we therefore have an obligation to provide long-term protection for forests while meeting our short-term needs.

Forest ownership is not free. There are taxes to be paid as well as other basic costs that come with simply owning forestland. When forests return real economic value that offsets such costs, their owners are more likely to keep them as forests instead of converting them to other non-forest land uses. Keeping even small, family-owned parcels of forestlands intact is important if we want to meet the Wildlands and Woodlands goal of 30 million protected acres. There are few markets for the multitude of environmental services that forests provide to society. We are working to establish markets for these valuable services, but for the time being, timber is the most reliable market that landowners can access to help offset the cost of ownership.

This is where forestry comes in. The practice of forestry can provide society with income-generating wood products in addition to benefits like wildlife habitat and recreational opportunities, while also ensuring forests are able to provide those same benefits and more in the future.

As markets for environmental services grow, mature forest management will focus more on providing those services. The growing carbon market is a good example: Carbon offset firms can now register carbon offsets on private forests, and individuals and companies can then purchase offsets to compensate for activities that release carbon dioxide. The offsets recognize the climate benefits that trees and forests provide by capturing and storing carbon and thus reducing greenhouse gases.

If landowners can be paid for carbon, our goals and outcomes for management shift to a combination of carbon and timber production while still maintaining the many other values forests provide. The responsible practice of forestry helps relieve the financial burden of owning land, and thereby subsidizes the other benefits that landowners and the public receive from forests.

Guiding Principles

New England Forestry Foundation recognizes that its forests provide numerous goods and benefits. They include the following, and several are further outlined in this document's "Forestry Goals" section.

- Forest products
- Periodic income to NEFF that can be reinvested in forest conservation
- Community and regional economic value
- Protection of water quality
- A variety of habitats, including some for rare and endangered species
- Biodiversity
- Protection of cultural, historic, and archaeological resources
- Opportunities for recreation, education, and solitude
- Climate change adaptation and mitigation
- Opportunities for demonstration, experimentation, and innovation

To ensure the long-term availability of these goods and benefits, NEFF is committed to an overarching principle of sustainability in managing its lands, and will:

- Preserve site productivity. NEFF will manage its lands in accordance with the best available science to protect and maintain the basic properties of a site's ability to grow trees.
- Manage so as to maintain the biological and economic integrity of the land. NEFF manages its forestland to maximize the long-term value in the land and its systems, and will not sacrifice long-term benefits for short-term financial gain.
- Manage with humility and recognize the limits of our knowledge. Forests work in decades and centuries. NEFF will manage its lands conservatively in order to preserve the continuance of native species and genetic diversity within those species.
- Think beyond the property boundary and consider the potential off-site consequences of our activities. NEFF's properties are part of a larger forested landscape both locally and on a region-wide scale. NEFF will consider the needs of the larger landscape in managing its lands.
- Be a good neighbor and consider its obligations to the community in which it is located. NEFF strives to work in collaboration with its neighbors in order for all involved to reach their land ownership objectives.
- Develop management plans within both an ecological and human context, in consideration of the full range of forest values. NEFF will develop long-range forest and regional plans documenting current conditions, how the lands fit into the landscape, and actions for the future.
- Maintain current management plans based on economically practical natural resource assessments. NEFF will prepare forest management plans on a regular basis for each individual management unit that integrate site-specific information with landscape-scale objectives.

- Consider and take advantage of demonstration opportunities. NEFF's properties are all forestry demonstration sites. NEFF will offer educational opportunities that highlight management options when possible.
- Manage adaptively. Forests are dynamic and NEFF will modify its management as stand structure, species composition, and markets change.
- Document, analyze, and disseminate results. Education is key to NEFF's founding and mission. NEFF will compile the results of its more than 70 years of forest management activities and make the results available to other landowners and to the general public in the future.

Forestry Goals

NEFF works to balance many objectives when managing its forests. Not every goal can be reached on every acre, but they are all taken into consideration when making decisions about how to manage each acre.

Exemplary Forestry

Adhere to and achieve specific metrics within Exemplary Forestry Standards, outlined in the following section.

Forest Products

NEFF strives for its properties to produce valuable goods and services to society. Given the rate of consumption of wood products in the United States, NEFF feels it is imperative to supply as much of that material within the region as is practical. Local production of raw materials reduces long distance shipping—an energy-intensive process that contributes to climate change—and helps prevent demand from shifting to overseas locations with fewer environmental protections.

NEFF is also working to increase the use of wood in building construction. Sustainable wood products like cross-laminated timber are a renewable resource, store carbon, and can safely replace steel and concrete, whose production processes emit significant amounts of greenhouse gases.

Periodic Income to NEFF

NEFF's forests serve as part of the organization's endowment, and annually return income to further the organization's conservation and educational efforts.

Community and Regional Economic Value

NEFF's lands play a role in their surrounding communities and in the greater economic activity of the region. NEFF's lands provide recreational opportunities to local individuals while contributing to the rural economy by supporting foresters, loggers, truckers, mill workers, and associated businesses through their management.

Water Quality

NEFF protects water quality by meeting or exceeding each state's Best Management Practices, preventing erosion by suspending machine operations in wet weather, limiting machine operation in riparian areas and on vulnerable soils, prohibiting off-road vehicles not involved in forestry, and maintaining its roads and culverts in good condition.

Wildlife Habitat

NEFF's management activities create and maintain a variety of habitats for a wide range of plants and animals, including some rare and endangered species. Young forest habitat is created where it is lacking

as well as in specific instances for certain species. NEFF will also set aside small and large reserves for the development of late-successional forest characteristics.

Biodiversity

NEFF seeks to protect and enhance plant and animal diversity through habitat management. NEFF works in consultation with state and federal wildlife and natural-heritage agencies to accomplish desired population goals.

Climate Change Adaptation and Mitigation

In an era of increasing climatic change, NEFF strives to help its forests adapt to the impacts of climate change, and to sequester carbon both in the trees growing on-site and in long-lived products made from harvested trees.

Protection of Cultural, Historic, and Archaeological Resources

In keeping with relevant state and federal regulations, NEFF protects significant cultural features found in its forests, such as Native American sites, stone walls, cellar holes, cemeteries, and monuments.

Recreation, Education, and Solitude

NEFF's lands provide opportunities for the general public to immerse themselves in a forested landscape for a multitude of purposes. Recreational opportunities vary from property to property but the vast majority of NEFF lands are open to the public.

Demonstration, Experimentation, and Innovation

NEFF strives to educate private landowners, the general public, and other professional foresters about how and why NEFF manages its forestland. This is done through signage, tours, educational programs, and other communications methods.

Exemplary Forestry: NEFF's Standards and Measurable Outcomes

In response to both internal and external questions about its forestry practices, NEFF has defined specific metrics that quantify the characteristics of the forestry it aspires to practice and promote. This is a shift from most general characterizations that intend to assure sustainable forestry. Typically, the principles or goals lack specific metrics, which makes it difficult to measure success or provide the public with assurances that things are going well.

There is a good reason for this reluctance; the appropriate application of forestry principles varies widely depending on site conditions, age and development of the forest, natural disturbances, as well as changing economic and ecological needs. Despite these difficulties, NEFF believes it is possible to establish measurable criteria that we can commit to over time and across our entire ownership. NEFF has chosen to call this “exemplary” forestry because it connotes that the concept is aspirational, and while advanced, does not purport to be perfect.

Fundamentally, NEFF is looking to maintain or enhance the public values that its forests provide, like wildlife habitat and clean water, while also supplying materials—wood in its many forms—that are environmentally preferable to their non-wood alternatives and yield an acceptable financial return. In this regard, NEFF proposes to build on and supplement the good work already in place to advance good forest practices, such as third party forest certification, and to define the concept of exemplary forestry concisely with a few of the most powerful metrics indicative of good stewardship in a commercial forestry setting. Thus, the definition NEFF is seeking is intended to 1) protect the forest environment and the “ecosystem” services it provides, while 2) enhancing wildlife habitat for the full range of species present, and 3) increasing the quality and quantity of wood produced.

NEFF recognizes that to achieve ecological and particularly wildlife habitat goals, the management of its lands must be viewed in the context of the landscape where they occur; therefore, this is written from a landscape perspective. These goals should be viewed in the context of at least tens of thousands of acres in settled areas and perhaps a hundred thousand acres in rural or undeveloped areas. In this regard, NEFF intends for the management of its lands to address the most pressing needs apparent in the landscapes where they occur.

The specifics of what constitutes exemplary forestry will of course vary from one forest region to another. What follows is an initial attempt at defining exemplary forestry for the Acadian Forest Region, which encompasses northern New England and beyond. NEFF hopes to become more active there in the future.

Exemplary Forestry Standards for the Acadian Forest Region

NEFF aspires to practice exemplary forestry, which includes:

1. Implementing “Best Management Practices” to protect soils, riparian and aquatic habitat, special habitats, wildlife trees, etc.
2. Implementing advanced silviculture by practicing forestry that results in:
 - Continuously improving forest stands over time in terms of both quality and quantity.

- Conditions which are well suited to the umbrella wildlife species known to be representative of the habitat needs of more than 75% of native species.ⁱ

Umbrella Wildlife Species	% of Property	Forest Stand Condition Described
American Marten ⁱⁱ	16%	Blocks of at least 640 acres which are at least 80% stocked at over 80 ft ² of basal area (approximately 16 cords/acre)
Canada Lynx ^c	27%	Even aged blocks ≥ 15 acres in size which are regenerated to spruce and fir on a revolving schedule. ⁱⁱⁱ

- A diverse size class distribution of 5-15% of stands in seedlings, 30-40% in saplings and poles, 40-50% sawtimber (DeGraaf, et al. 2005) (including 10% of the total area in large diameter multi-storied stands—note 9% of NEFF’s existing lands are in reserves).
 - Growing species^{iv} well suited to each site.^v
 - Stocking that fully occupies the sites: an average at least “B” line stocking for stands not currently being regenerated.^{vi} NEFF lands currently average about 30 cords/acre.
 - Growing and harvesting quality timber—an average of 0.5 cords/acre/year,^{vii} and targeting high quality products.
3. Addressing climate change as the knowledge base becomes available, increasing the resilience to, adaptation for, and mitigation of, climate change,^{viii} including but not limited to using forests and forest products to sequester more carbon and more broadly reduce greenhouse gas emissions.
 4. Diversifying management approaches. To the extent that site conditions and the landscape context allow, NEFF intends to manage significant portions of its properties using even and uneven aged management approaches and employing a “triad” approach to management.^{ix}
 5. Building public support for forest management. Public support for forest management depends in part on how forests look. In this regard, NEFF intends to manage its lands to maximize aesthetic benefits particularly in key areas (e.g., attractive roadsides, trails and shorelines) and minimize adverse effects (e.g., careless looking harvests) (USDA Forest Service 1995).

Silvicultural Systems

Forests are constantly changing due to natural forces, ranging from climate change and glaciers, to fire, windstorms, ice storms and insect pest infestations. The nature and pattern of these forces are called disturbance regimes. These natural disturbances that pre-date human impacts on forests, as well as some we may not be aware of, have shaped the evolution of our native species. Over the last several thousand years, activities of people have been added to the mix of forces. These include kindled fire, hunting, fishing, timber harvesting, tapping for maple syrup, agriculture, species introduction, and species manipulation.

The scale of the various disturbance events that affect forests today can range from glaciers, which wipe the entire region clean, to selection harvests of individual trees. Depending on their scale, these disturbances are either called “gap” replacement events (1/10th to 30 acres) or “stand” replacement events (30 to several thousand acres). High energy disturbances such as fires, insect epidemics, hurricanes or large clearcuts are examples of stand replacements events.

Native biodiversity has evolved, and continues to evolve, in response to all these disturbances. It is clear that forest management that approximates the pre-historic disturbance regimes will likely allow native biodiversity to endure. (Although, this is not guaranteed and some species may disappear for reasons we do not understand, despite our best efforts.) It is equally clear that as world wood demand increases, more of New England’s forest will be managed intensively for wood. This will occur on both large and small ownerships. Regardless of whether this is for spruce/fir pulpwood, white pine sawlogs or high value hardwood sawlogs, these intensive systems will not closely mimic the pre-historic disturbance regimes. As management intensity increases on any land, the care given to maintaining native biodiversity must also increase.

Having a thorough understanding of the forest characteristics that are important to biodiversity will help landowners develop and maintain suitable conditions. A mix of pre-historic, low, moderate, and intensive disturbance regimes occurring across the landscape, combined with the maintenance of suitable structural characteristics, patch size, and adjacency will protect native biodiversity.

NEFF recognizes and utilizes silvicultural regimes that are appropriate for the native species, soils, and likely disturbance patterns of New England. They are largely based on even aged area control systems that have been proven to successfully grow and regenerate well-formed trees of valuable species. The discussion revolves around the size of the areas. With one big area, the stand is even-aged. With many small areas of different ages, the stand is uneven-aged. Some plants or ecosystems that are especially intolerant of direct sunlight or require larger openings may require special management measures.

NEFF’s forests are largely even-aged or two-aged stands. The current forests of New England contain multiple species, communities, and sizes of trees, but they very seldom contain multiple ages in the canopy layer of a given stand. Many stands do have an established sapling sized understory, which is the result of some past harvest. As forests are harvested multiple times using systems that start new trees, the forests will develop different canopy layers, with overstories and understories.

The usage of even-aged or uneven-aged terminology has both political and biological meaning. A true even-aged system would result in forests with only one or two age classes, while by definition an uneven-aged system would develop forests with three or more ages.

Historically, many stands on NEFF's forests were lightly and partially harvested with the idea that we were thinning the overstory and simultaneously regenerating the forest. Most of these efforts failed to establish and grow the regeneration desired because not enough sunlight reached the forest floor or the leaves of the regeneration. We achieved some new growth of shade tolerant species such as beech, hemlock, and sugar maple, plus a few mid-tolerant species, but these trees usually failed to thrive and grow because the canopy tree crowns responded to the thinning by expanding and closing off the sunlight. To be successful, the gaps in the crown must exceed the space the surrounding trees crowns can occupy after their post harvesting expansion.

Going forward, NEFF will be using silviculture techniques in areas managed for high quality wood that focus on two main goals: purposeful regeneration of desired species and concentration of site growth resources on high quality individual trees.

NEFF implements a variety of harvest prescriptions designed to either thin existing trees without concern for regeneration or utilize purposeful regeneration techniques that normally use both patches and dispersed shelterwood systems to get the desired regeneration. Occasionally clearcuts are conducted to replace unresponsive stands and/or create needed wildlife habitat.

The result of all these different prescriptions is intended to convert largely even-aged forests to largely uneven-aged forests. The new forests will be comprised of small patches of trees of the same age in a matrix of patches of different ages. This better replicates a more natural forest that will support a broad range of plant and animal species.

Intermediate Harvests

Intermediate thinning harvests are those that are done to manage existing overstory trees. Regeneration may be established but it is not a goal and need not be considered at this time. Thinning a pine stand to add growth to the residual logs may well result in a flush of understory hardwoods or softwoods. These little trees should not be considered as representing the future stand while the overstory pine is still managed as a fully stocked stand; heavier overstory removals and more sunlight are required to ensure their survival.

- Thinning from below: Cutting suppressed, intermediate, and poorly formed co-dominant trees to allow well-formed dominants and co-dominants to thrive. Very few trees are removed from the upper canopy. The purpose is to reduce the number of stems per acre so that the well-formed residual dominant trees will increase in size and value. These harvests are pretty rare because they produce very little quality wood and depend on good pulpwood or fuelwood markets.
- Crown thinning: Cutting trees from all crown position groups—suppressed, intermediate, co-dominant, and dominant. Trees are removed from the canopy to allow expansion of the crowns of residual trees so those trees will increase in size and value. These harvests are common and produce a mix of products. A new variation is the *“Irregular” Crop Tree/Shelterwood* system that combines crop tree nurturing from a very early age through long rotation maturity, with a small patch shelterwood regeneration system. This is only viable on highly productive sites with well-formed valuable trees. One of the keys is light removals on a very short (10 yr +/-) harvest cycle.

Regeneration Harvests

Regeneration harvests are those done with the intent of releasing or establishing regeneration of desirable species that will have the sunlight, water, and nutrient resources to grow vigorously into the canopy. Residual overstory trees often increase in size and value while this occurs.

- **Clearcut:** These are harvests over five acres in size which remove all the trees from the suppressed, intermediate, co-dominant, and dominant crown position classes. They should remove all trees down to 2" DBH. They put full sunlight on the forest floor. Regeneration can be in the form of stump sprouts, seed origin, or the release of small established regeneration normally less than 2 feet tall. If the established regeneration is larger than this, the harvest is an overstory removal and is the last phase of a shelterwood system.
- **Shelterwood systems:** These systems use partial shade to regulate the establishment or release of regeneration. They can be done either on a dispersed or patch pattern. In either one, enough of the overstory needs to be removed to allow the regeneration access to unblocked sunlight during several hours of the day. To be successful, the gaps in the crown must exceed the space the surrounding trees' crowns can occupy after their post harvesting expansion. Shelterwood harvests are done in several stages: one, two, or more partial harvests to establish and develop a fully stocked vigorous stand of regeneration and then a complete removal of the residual overstory. Extended shelterwood systems using 3 or more entries blur the line between even and uneven aged stand structures. The resulting multi-aged forest provides a diverse range of habitats, structures, and features suitable for a wide range of flora and fauna species. The distinction between dispersed and patch systems is the size of the opening and the treatment of the stand between the openings.
- **Dispersed shelterwood:** These harvests create openings from 0.1 to 0.24 acres in size, areas so small that they normally cover almost all the area of the stand resulting in no areas being unharvested. This results in the whole area being disturbed and exposes almost all the residual trees to harvest related injuries. Additionally, it is difficult to avoid damaging the valuable regeneration in subsequent harvests because it is so intermingled with the residual stand. This system normally results in a new even-aged stand across the whole area.
- **Patch shelterwood:** These harvests create openings from .25 to 5 acres in size. Ideally, no harvesting occurs in the areas between the patches. Occasionally a high risk, high value tree could be removed if it is within a very short distance of the skid trail. If this system is done over an extended time period then several different age cohorts are established with the stand. This system requires skid trail location management, and subsequent entries must be done in a way to avoid damaging the established patches of valuable regeneration.
- **Expanding-gap irregular shelterwood, with or without reserves:** This system removes patches of trees and, in subsequent entries, expands the openings by cutting around the periphery of the openings. It can be done with or without retaining some large reserve trees in the openings depending on objectives and stand conditions. The reserve trees are never—or perhaps only rarely—cut but are left to retain an age class indefinitely to mimic some of the features of old growth, benefit wildlife, and enhance the aesthetic appeal of the forest.

- Seed tree: These systems are a variation of shelterwoods. They are a two entry system, one to establish regeneration and one to remove the residuals. They provide almost full sunlight for the regeneration while also providing a ready source of desirable seed. This system removes all the trees except for a few dominant quality specimens per acre, normally from 3-8. This system works well for shade intolerant or mid-tolerant windfirm species that are not subject to post-harvesting shock mortality. Both white pine and red oak fit these characteristics.
- Overstory removal: Overstory removal is the release of the new stand from the overtopping by the canopy stand. It is a necessary step in any of the regeneration systems described above. Occasionally, a seed tree cut is left with its residuals but it is not good timber practice to do so. As a rule of thumb, the more advanced and larger the regeneration trees are, the more difficult it is to remove the overstory without unacceptably damaging the regeneration. This is one reason that the patch system works well: the regeneration is concentrated and somewhat distinct from the trees being harvested.

Reserves

At this time, NEFF does not have specific goals in terms of ratios or quantities of reserve lands versus actively managed lands. Most reserves are small and identified at the individual forest management planning level where foresters have identified unique sites, wet areas, steep slopes, rocky soils, or inaccessible sites that are largely set aside from harvesting. One exception is the wildlands area on the Hersey Mountain Forest in Sanbornton and New Hampton, NH. This 2,154-acre area was set aside within the larger 3,256-acre forest after an ecological survey identified unique and rare conditions worthy of special management.

Pre-Commercial Treatments

NEFF historically conducted limited pre-commercial treatments on its forests in an effort to improve the quality of trees of all sizes growing on its lands. These operations would have included pruning, weeding, girdling, and pre-commercial thinning among others. Often these practices were underwritten through cost share funding from various state and federal agencies through the years. These activities also fit well into NEFF's mission of demonstrating various forest management techniques to other private landowners throughout New England.

In the early 2000s, these practices were halted due to questionable long-term economic return to the organization. Research and financial analysis had shown that these practices did not result in a consistent increased financial return at the time of a commercial harvest decades later. NEFF has recently reinstated a limited amount of pre-commercial work in select locations on its lands to be consistent with its Exemplary Forestry Standards and educational work. Cost share funding will be sought where available. NEFF will continue to reevaluate the financial returns possible from pre-commercial treatments in different forest types and different forest conditions.

General Land Management Policies

Biomass

The increased use of forest-derived biomass (tops, limbs, dead trees, and live trees not traditionally marketable) over the past decade has provided both opportunities and challenges to the forestry community. On one hand, it has provided an economic incentive for landowners and foresters to remove lower quality trees thereby enhancing the quality of the future stand. But removing this much material has raised concerns of depleting site productivity and negatively impacting wildlife habitat and diversity.

To address these concerns, NEFF adheres to the *Forest Biomass Retention and Harvesting Guidelines for the Northeast* as drafted by the Forest Guild Biomass Working Group in 2010 (see full report for more details). The main guidelines include:

- Protect rare forests and species
- Retain downed woody material
- Retain forest structure for wildlife and biodiversity (snags and live, but decaying trees)
- Protect water quality and riparian zones
- Conduct responsible and appropriate harvesting operations

Invasive Species and Herbicides

Invasive species are a seemingly ubiquitous problem throughout New England. It is uncommon for NEFF lands not to have some level of invasive species infestation. Some instances are relatively minor and localized while other are more serious and widespread. Control of invasive species is a long and expensive proposition. Sometimes, eradication is not possible.

NEFF currently has a modest annual budget to devote to invasive species control. NEFF will prioritize control efforts where:

- Invasive species are inhibiting forest tree regeneration
- New infestations of particularly serious invasive species occur
- There is coordinated effort by multiple property owners
- There are opportunities for cost-sharing through state or federal funding

Control of invasives can be accomplished in a number of ways: biological, chemical, and mechanical. Often a combination of more than one of these methods is needed and implemented over multiple years. Chemical control through the use of herbicides is often the most effective and cost efficient. In applying herbicides on its lands, NEFF will follow all applicable state laws, follow proper use according to herbicide labels, and use licensed professionals where required.

Public Access

In general, NEFF forests are open to most forms of public recreation. Forests are open from dawn to dusk. NEFF encourages Leave No Trace recreational practices and asks property users to carry out and properly dispose of all litter, including dog waste.

Parking availability varies with each forest. During high-traffic times, visits may need to be coordinated to space availability, as parking on public roads is under the jurisdiction of local towns and thus can neither be encouraged nor permitted by NEFF. Most parking is in the form of old log landings. They are generally only large enough for a few vehicles and not plowed during winter. As a result, we cannot guarantee access during these months.

Camping is generally not permitted on our properties, with the exception of Chamberlain Reynolds Memorial Forest in Center Harbor, NH. Occasionally, scout and other community groups request and may be permitted permission to camp in certain locations. Fires are prohibited in all NEFF forests.

Bicycling is permitted on our properties. We ask that all bikers maintain a safe and reasonable speed, remain only on marked trails, announce themselves when approaching hikers from behind, and yield to all hikers and equestrians.

Dogs are permitted on our properties, but they must be kept on marked trails, must not damage property or harass wildlife, and must be under control at all times.

Hunting and Fishing

Hunting and fishing are permitted at most NEFF properties in accordance with individual state law. Only modern tree stands which are not nailed or spiked to trees are allowed. Stands must be labeled clearly, with the name and contact information of the hunter. Stands may be placed on NEFF property one month prior to opening day and they must be removed within one month of the close of hunting season. We reserve the right to remove, dismantle, and/or discard any stand on our property that does not abide by our guidelines, or any stand that remains after the end of hunting season.

Target shooting is prohibited on all NEFF properties.

Motorized Recreation

Motorized recreation as a general rule is not allowed on NEFF forests. In certain circumstances, NEFF has partnered with local snowmobile clubs to maintain and monitor seasonal snowmobile trails across its lands. ATVs, motorcycles, 4-wheel drive trucks, and other motorized recreational vehicles are not allowed on NEFF forests, trails, or roads.

Signage and Education

NEFF maintains a variety of signage on its properties. In general, NEFF has a basic property identifier sign at the main access point stating the property name, organization name and contact information, management objectives, and the donor's name. Given the organization's 70+ year history, NEFF has a variety of signs with different language and design. There are also additional informational and property regulations signs posted on properties but there is no consistency across NEFF's ownership.

NEFF has recently finished a multiyear rebranding effort resulting in a new logo. NEFF is working on a plan to design new signage that incorporates the new logo and branding guidelines.

Administrative Procedures and Public Documentation

In 2004, NEFF's Board of Directors adopted the Land Trust Alliance's (LTA) Standards and Practices. These Standards and Practices include requirements on monitoring, boundary maintenance, and stewardship funding to name a few. NEFF's management of its forests complies with the Standards, and in particular with Standards 12A through 12F.

Monitoring

LTA suggests annual monitoring of fee owned properties. NEFF accomplishes this requirement through annual site visits by staff, consulting foresters, or volunteer Forest Stewards.

Certification

NEFF's forests have been certified by the Forest Stewardship Council (FSC) since 2000. NEFF is currently certified through the Group Forest Management Certificate administered by the New England Forestry Consultants. The American Tree Farm System has also certified NEFF's forests in Maine, New Hampshire, Vermont, and Massachusetts as Tree Farms.

Management Planning

NEFF has a written Regional Management Plan for its entire ownership. This plan is updated and revised by NEFF staff as necessary but should be thoroughly reviewed at least every five years.

Individual Forest Management Plans are prepared for each distinct Community Forest or management unit. These management plans are usually prepared by an independent, licensed, private consulting forester with guidance and oversight from NEFF staff. Each management plan is reviewed and revised as appropriate according to the condition of the forest, state regulations, and activity level. This usually occurs at 10 or 15 year intervals.

An Operations Plan is prepared for every harvest and all other important silviculture tending operations in NEFF's forests. The results of each operation are reviewed at the completion of the project.

Each entry in NEFF's forests for tending or regeneration is supervised by a consulting forester with periodic inspection by a NEFF staff member.

Inventory

NEFF annually hires contractors to complete an updated inventory and assessment of growth for its forests. This is completed through a rolling inventory of 200 random plots divided proportionally across the five different forest types classified on NEFF lands. Every year, the 40 oldest inventory points are removed and 40 new random points are measured. Inventory and growth are then recalculated with the most recent set of 200 plot data. Tree volumes, products, and values on each individual forest are calculated by a consulting forester at each individual forest management plan update.

Additional Resources

For more information about NEFF forests and forest management, please review the following resources.

- [Path to Sustainability](#)
- [NEFF's Approach to Forest Management: An Introduction for Non-Foresters](#)
- [NEFF Exemplary Forestry Standards](#)
- For property-specific Forest Management Plans, contact cpryor@newenglandforestry.org

NEFF also invites you to visit one of our forests to learn more about forest management. Find a property near you at newenglandforestry.org/explore/explore-our-forests.

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- ⁱ The US Fish & Wildlife Service, as well as state wildlife management agencies, can provide recommendations on the best species to select. These species too may change over time.
- ⁱⁱ Management suggestions from Dr. Dan Harrison.
- ⁱⁱⁱ Harvest blocks being regenerated are intended to include legacy trees and patches (see Bennett 2010, Tubbs, et al. 1987).
- ^{iv} Decisions of what tree species are “best suited” to each site can be guided by the recommendations contained in soil surveys prepared by the Natural Resources Conservation Service with site conditions verified by a qualified forester or soil scientist. The species specified may change as a result of climate change.
- ^v This requires matching the silvicultural system to the site and may require controlling invasive species and/or excessive browsing (see Leak 2014, Leak, et al. 2014, Bennett 2010, Rawinski 2014).
- ^{vi} For example, in 8-10” diameter stands of mixed wood this would be approximately 20 cords/acre (see Leak et al. 2014).
- ^{vii} This will not be possible on some properties when they are acquired, e.g., if they have been depleted, also over time the value of the timber should be enhanced (more and better quality sawlogs).
- ^{viii} USFS guidance on how to increase forest resilience and facilitate adaptation will be followed.
- ^{ix} Achieving the several objectives outlined here is likely to require managing using the “triad” approach. That is, setting aside a modest portion of the property for passive or light handed management, while dedicating another modest portion for intensive management to produce the desired volume of wood, and yet the majority to ecological forestry (forest management that mimics patterns of natural disturbances) with a specific objective of addressing the challenges presented by climate change. For more on this topic see Seymour, et al. (1992).