Choices in Forest Management

Whether you, your family or your organization owns a forest, or you are a professional charged with forest management for a local, county, state, or federal agency, it is important to understand the various management options available to you.

This guide explains some of your options. In addition, it describes what forest management choices qualify a forest for recognition in the Old-Growth Forest Network.

OLD-GROWTH FOREST NETWORK

Choices in Forest Management

Green boxes denote practices eligible for forests to be in the Old-Growth Forest Network

Yellow denotes those practices requiring internal review

Tan denotes practices not allowed for forests in the Network.

▶ **Note:** Multiple approaches can be applied across an ownership and that a single ownership may contain both eligible and ineligible areas.

Practices & Approaches	Commercial Silviculture	Ecological Silviculture (with commercial forest product objective)	Ecological Silviculture (no commercial forest product objective)	Protective Forest Management	Wild Forest Management
Parcel Boundary Maintenance	X	X	X	X	X
Protection from Commercial Extraction			X	X	X
Recreational Access & Trail Hazard Mitigation	X	X	X	X	X
Tree Planting	X	X	X (Native species)	X	
Invasive Species Management	X	X	X	X	X
Pesticide Use	X	X	X (To manage invasive species, manage fire-dependent communities, site preparation before planting)	X	
Prescribed Fire	X	X	X (Limited to fire-dependent ecosystems)	X	
Variable Retention Thinning	X	X	X (Limited to the understory in fire-dependent ecosystems)	X	
Clearing to Create Early Successional Habitat	X	X	X		
Acceleration toward Big Trees and Structural Complexity	X	X	X (Structural complexity enhancement & similar practices)		
Commercial Thinning & Timber Harvest through Traditional Silviculture	X				
Salvage Cutting to Remove Dead/Damaged Trees after Disturbance	X	X	X (Not recommended)	X	

CHOICES IN FOREST MANAGEMENT

Definitions to guide your understanding of the table

Commercial Silviculture

This management approach is based upon a traditional agricultural model that converts natural forests to a "crop" harvested to maximize commercial production of wood fiber. This creates wood fiber as quickly and efficiently as possible and results in maximum financial returns. This approach also results in a loss of biodiversity by simplifying or destroying ecological processes, simplifying habitats, increasing the spread, frequency and intensity of wildfire, insect pests, and erosion. It also creates an unattractive landscape for recreation. It is unclear if there can ever be full biological recovery in forests that are intensively managed for forest products in this way.

Ecological Silviculture

This approach incorporates what we know about natural forest development into silvicultural decision making. Timber extraction may remain a major goal in this type of forestry. Forest types have different disturbance regimes and these are considered when planning harvests. Cutting is used as an analog for natural disturbances such as fire or windstorms. Just as so-called "legacies," such as old trees and large dead wood, are left behind after natural disturbances, some legacies are intentionally left behind in this type of management, as well.

Ecological forestry can be applied at varying intensities and scales, ranging from a restoration focus using timber harvesting as a tool, to "light on the land forestry" where ecological values are prioritized over monetary returns. Depending on harvest intensity, return on investment may be prolonged or sacrificed as compared to traditional commercial forest management.

Although ecological silviculture may be better at sustaining biodiversity than is commercial silviculture, impacts such as soil compaction, water quality degradation, disruption to sensitive wildlife and non-target species are some of the potential consequences of ecological silviculture. While not new, ecological silviculture practices have not been widely adopted. Misinterpretation of the concept, or greenwashing, point to the need for some form of standardization.

Private landowners, agencies and organizations may employ a combination of approaches in the forests they care for, depending on the mission, objectives, conditions, and policies that guide their work.

Identifying a section of the forest as a Preservation Core is a good way to begin transitioning away from intensive management. (For more information look under 'resources' on the **OldGrowthForest.net** website)

Protective Forest Management

Protective Forest Management is a compromise between letting nature take its course and guiding forest recovery in the direction humans would like the recovery to go. This management approach is used by many organizations tasked with managing parks and nature preserves—lands that often have dual missions of providing recreation and sustaining native biodiversity. It may include such practices as removing or applying herbicides to non-native invasive plants; removing hazard trees; prescribed burning; treating for insects and disease; and supplementary plantings of native species. These activities may be aimed at restoration toward a historical condition. Trail building and maintenance and installing interpretative signage for visitors are often a part of this type of management.

Wild Forest Management

Also known as Passive Forest Management, under Wild Forest Management forests are allowed to develop freely under prevailing environmental conditions and natural processes, including climate change, natural disturbances, and the arrival of new species. Management is not motivated by any explicit outcome and does not seek to shape ecosystem structure, function, or composition, or to guide ecosystem development.

Wild forests are useful as ecological baselines (control sites) to compare to other types of management. The forest may not always reflect preferences for aesthetics, structure, or species composition. Disturbance events are expected as part of the normal course of events and the forest is left as is. This approach has the potential for unintended consequences or harm to sensitive species. Additional information about wild forests can be found at the end of this document.

Old-growth forests
are one of the few land uses
where topsoil is created
instead of destroyed.

About Easements

One tool to ensure a forest remains a forest is a conservation easement. A conservation easement restricts certain uses of the land and is typically held and monitored by a non-profit land trust. There may be significant tax benefits to landowners for placing such an easement on their property. A land trust may ask for a monetary endowment to monitor and preserve the land in perpetuity.

Not all conservation easements are alike. Most restrict development but may allow for agriculture and forestry to varying degrees. Even a forest under conservation easement may be clearcut and managed aggressively unless specific limitations are specified in the easement. Loopholes can surprise landowners who sold their easement-protected forest, only to see it cut down by the new owners.

Conservation easements are highly customizable. It is important to specify in the easement what types of activities are restricted or permitted. Different parts of a property can have different restrictions. To protect a forest, a no-log easement or a Forever Wild easement is required. The Northeast Wilderness Trust and the 500-year Forest Foundation are two organizations that write Forever Wild easements. OGFN has examples available upon request.

Even public forests, such as town forests and parks, can be doubly protected with a no-log easement, thus eliminating the chance of future conflicts over use.

About Restoration

Ecological restoration aims to re-create, initiate, or accelerate the recovery of an ecosystem that has been disturbed. Common disturbances include logging, damming rivers, intense grazing, hurricanes, floods, and fires. While many restoration projects are well-intended, further questions should be asked to ensure that risks are considered and long-term outcomes are understood. One question is: How successful have other restoration attempts been? (Survival of planted trees is frequently lower than expected.) Also: If the restoration is successful, will the habitat be preserved, and how? For instance, in one area where Atlantic White Cedar trees were overharvested there is an ongoing effort to "restore" the forest by replanting. But the long-range plan is not to allow a wild forest to recover; rather, it is to create a woodland that can then be harvested again. Many people are donating to this restoration without an understanding of the long-range plan.

In national forests, dozens of logging projects across the country, particularly since the Healthy Forests Restoration Act of 2003, have failed to meet restoration goals, in some cases further reducing biodiversity to the point that new projects are being devised to address the failures of previous ones.

FORESTRY TERMS & MANAGEMENT PRACTICES

As the ground becomes shaded and the moisture-holding capacity of the soil increases, more tree species, along with more fungi, are able to survive.

➤ Fire-Dependent Ecosystems and Prescribed Burning

Some forested ecosystems have evolved with frequent, non-human caused fires. The longleaf pine forests in the Eastern United States and the ponderosa pine forests in the West are examples. Many organisms—from rare wildflowers to rare woodpeckers—find habitat in these fire-adapted forests. With the implementation of firebreaks (roads, irrigated fields, etc.) and fire-suppression, higher densities of trees and encroachment by other tree species can shift forests to a new composition, resulting in the disappearance of rare organisms.

Fire-dependent ecosystems are sustained by lightning-caused fires, historical and contemporary indigenous burning, and increasingly, by prescribed fire. Frequently, there are attempts to restore these forest communities to a historical reference conditions based on surveyor accounts, historical photographs and aerial images. Restoration attempts to re-initiate a fire regime can sometimes involve thinning, usually targeting smaller, younger trees.

The current use of prescribed fire may not always align with truly fire-adapted landscapes. Under the guise of fire-adapted ecosystem management, prescribed burning is sometimes used to promote the growth of more marketable timber species (e.g. pine and oak) and to discourage less marketable species (e.g. beech, maple, and gum), which may negatively impact biodiversity. While prescribed fires escaping control is rare —an estimated **one out of a thousand**—in 2000 the Upper Frijoles prescribed fire (aka Cerro Grande wildfire) in New Mexico escaped and **destroyed 235 homes**. Some communities don't want prescribed burning near them for this reason. Smokey air is another reason prescribed fires may be unpopular.

➤ Forest Succession

As forests recover after a severe disturbance, certain tree species—those able to grow in full sun and drier conditions—are the first to return. As the ground becomes shaded and the moisture-holding capacity of the soil increases, more tree species, along with more fungi, are able to survive. If the forest escapes further disturbance for a long period of time, shade-tolerant tree species become more abundant. This process of change over time is called ***succession***.

Some forest managers, for various reasons, seek to stop or reverse successional changes. With the exception of certain management practices, such as those to maintain fire-dependent ecosystems, forests in the Old-Growth Forest Network are allowed to develop naturally over time.

➤ Thinning

Thinning—removing living trees from a forest—may be carried out on many scales, ranging from light hand-thinning to mechanically removing wide swaths of a forest. In commercial settings, thinning is primarily done to speed the growth of the remaining trees so that they will be larger and bring in more income at final harvest. Thinning is also used in an effort to restore fire-dependent open forests, or even to "fire-proof" forests, but that practice is controversial.

➤ Salvage

Post-fire and post-storm "salvage logging" removes downed and damaged trees in order to capture their economic value and reduce perceived fire risks associated with newly created deadwood fuels. Salvage logging is not recommended for forests in the Old-Growth Forest Network because dead, damaged, and downed trees are essential to ecosystem recovery, retaining carbon, and providing critical wildlife habitat.

➤ Invasive Species

Non-native species that spread quickly and can cause economic and ecological harm.

Protective Forest Management is a compromise between letting nature take its course and guiding forest recovery in the direction humans would like the recovery to go.

NEWER FOREST MANAGEMENT TRENDS

Old-Growth Silviculture (aka Structural Complexity Enhancement)

DESCRIPTION: Manipulating a forest to mimic the structural complexity found in old-growth forests.

MANAGEMENT: Removing trees to create gaps; girdling trees to create snags; pulling down trees to create "pit-and-mound" topography; cutting into trees to create cavities for wildlife. Leaving large "legacy" trees in place.

RATIONALE: Much of the biodiversity in old-growth forests comes from the forests' complex structure, which develops over time. This management approach attempts to speed up the formation of these complex structures.

CAVEATS: ***Forests can't be forced to grow older faster.*** In time, the forest would naturally develop these age-related features. Artificially creating these features can inadvertently compact soil, introduce invasive species, and destroy some individual trees that could otherwise live for centuries.

Climate-Smart Forestry (aka Adaptive Silviculture for Climate Change)

DESCRIPTION: Manipulating forest structure and composition to reduce or mitigate the anticipated effects of climate change.

MANAGEMENT: Keeping tree species diversity high as insurance against changing climate conditions, as some species are expected to do better than others. Some foresters advocate planting species that are more heat-and-drought tolerant, even species not naturally occurring in a particular forest. Keeping the number of trees per acre low may help trees survive during droughts. Mechanical thinning may be used.

RATIONALE: Climate change is predicted to affect various tree species differently. Therefore, it is desirable to plan for a future forest instead of what is currently on the landscape. The pace of climate change may outpace the dispersal capability of trees. Human management and structures may interrupt natural species migration.

CAVEATS: ***Forests have naturally adapted and migrated in response to past climate change.*** While human-caused climate change is more rapid, the inherent resilience of some forests may be overlooked. Modeled predictions vary and may or may not be correct. With regard to planting, nursery seedlings contain far less genetic diversity than natural populations. A cautionary approach is needed. Consider instead the **multiple benefits of stricter protection and allowing natural processes to do more.**

About Carbon

Because they remove carbon from the atmosphere, forests are a natural solution to climate disruption. Reduced cutting frequency (pro-forestation) can result in more carbon being stored in a forest.[1] Numerous studies show that the oldest forests store the most carbon.

Carbon sequestration in forests can provide a source of income for forest owners. Some forest owners, both private and public, extend cutting rotations or even eliminate cutting altogether, choosing instead to receive carbon credit payments for the extra carbon their forests are storing.

At present, those who have placed no-log or Forever Wild easements on their land may not be eligible for the carbon market payments, as the market seeks 'additionality' (proof that more carbon would be stored with the carbon agreement than without).

Fire-Risk Management (aka 'Fire-Proofing' Forests)

DESCRIPTION: Extreme reduction in biomass in an effort to reduce the spread of wildfire.

MANAGEMENT: Complete clearing of wide firebreaks; removing understory, midstory, and some overstory trees; leaving widely spaced (30 feet apart) overstory trees, often followed by prescribed fire; pile burning or mechanically removing slash left by the cutting.

RATIONALE: With more space between trees and less brush on the ground fires are less likely to spread.

CAVEATS: ***Biodiversity is greatly reduced in forests treated for fire-proofing, particularly after post-fire salvage logging.*** (Example: Spotted owls are less likely to be found in forests managed like this than in wild forests.) Large trees, woody debris, and other biomass important to forest ecosystems are often characterized as "fuel." In fact, larger trees are more fireproof because of their retained moisture and fire-resistant bark. Yet, mature trees are sometimes removed and sold to pay for this expensive management.

With intensive management, the natural feel of these forests is disrupted. Roads are created and maintained to provide access for fire-management activities, fragmenting forests and increasing opportunities for human-ignited fires. Some research shows that fires can spread faster and with greater intensity when forests are managed this way.

Young Forest Initiative (aka Clearing for Early Successional Habitat)

DESCRIPTION: Artificially creating early successional habitat (aka pre-forest) in a forested ecosystem.

MANAGEMENT: Clearing or radically thinning forested areas.

RATIONALE: Herbaceous plants, trees, and shrubs that are the first to return after a forest is cleared, are the preferred habitat of game species such as woodcock, quail, ruffed grouse, and deer. With the return of forests to formerly cleared areas in the Eastern and Midwestern US, fewer open-hunting areas exist. Re-clearing forested areas to produce more early successional habitat may temporarily cause an increase in the populations of popularly hunted species and non-game species that prefer this habitat.

CAVEATS: ***Early successional habitat was historically rare in the forested Eastern US (less than five percent).*** Clearing forested areas to create this habitat may result in fragmenting forests, introducing invasive plants, compacting soil, and reducing the carbon-holding capacity of the forest. Early successional habitats are naturally created by events, such as ice storms, wildfires, and extreme wind like derechos and tornados. These forest-disturbance events are predicted to increase with climate change, naturally creating early successional habitat.[2]

About 'Current Use' Taxation

Thirty-six states offer 'Current Use' programs (https://mylandplan.org/content/resources-landowners), and the goal is the same from state to state: to help landowners keep their land undeveloped by calculating property tax according to how the land is currently used rather than at its real estate value as a building site.

In some states a forest must be actively managed for timber extraction in order to qualify for the lower tax rate. Forest owners who want to keep their forests wild in those states must pay the highest property tax rate (New York is one such example). Some states are updating their laws to reflect the ecological importance of wild forests. For instance, in 2022, Vermont expanded their Current Use tax laws to allow forests 25 acres and larger, deemed ecologically sensitive, to forgo timber extraction. Even in states where Current Use programs do not require timber extraction, they often require management plans written by a certified forester. These plans may reflect training for timber-focused silviculture. In our estimation, because of the ecological benefits provided by wild forests, they should qualify for the Current Use tax programs.

Management of Wild Forests

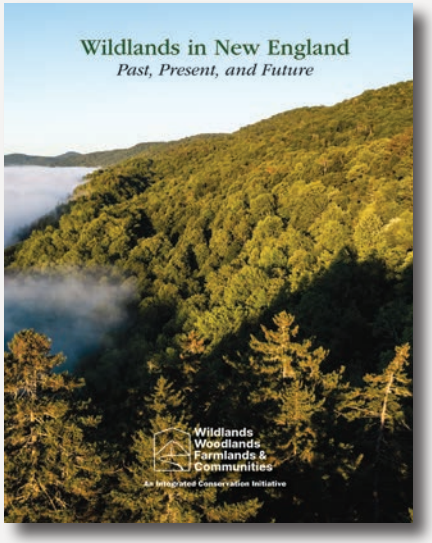
Wild Forest Management makes no attempt to recreate historical conditions, develop desired future conditions, or maintain the existing conditions and ecosystems. It establishes no target for individual species or environmental states. It accepts natural change as inherent to all ecosystems and allows ecological processes—natural disturbances, physical and biological flows, and their interactions—to operate without constraint. It is open to surprises, novel conditions, and events that may challenge human comfort, aesthetics, and safety. As such, wildland as a management scheme generally demands humility. It openly embraces ecosystem dynamics and rejects the notion of a static landscape with a fixed cast of flora, fauna, and fungi.

Wild Forest Management depends upon restraint and intention. Minor small-scale actions that carry no intent to alter the ecosystem or direct its future trajectory may occur. Low impact hiking trails are allowed in Wild Forests to facilitate human experience and enjoyment. Maintenance generally involves the least intensive means possible and is often limited to non-mechanized hand tools.

Hand weeding of non-native species that compete with rare species may be allowed, whereas broad application of herbicides, prescribed fire, or mechanical treatment to maintain an open forest understory or to perpetuate early successional vegetation are not, because they purposefully alter the trajectory of ecosystem development.

If management is ongoing for the creation or restoration of specific conditions and processes such as old-growth structures, communities such as savannas and barrens, or the maintenance of particular plant or animal species, then this is not considered Wild Forest Management.

Many agency policies, easements, and management plans allow for or encourage control of invasive plants and animals. However, given that the threat of non-native and invasive species is often uncertain and overstated, and their values underappreciated in many landscapes, many groups and the federal interagency task force argue for minimal control. At the very least, a comprehensive review of, and evidence for, negative consequences should be well-documented; control measures should be highly targeted and limited; and long-term monitoring of the consequences of management should be instituted.



All of the information on this page and the following page has been extracted, with permission, from *Wildlands in New England, Past, Present, and Future*.[3]

We encourage you to read the report and the references it contains.

wildlandsandwoodlands.org/wildlands-in-new-england

Benefits of Wild Forests

As Wild Forests age and mature, they contribute abundant woody debris in streams, along lakeshores, in wetlands, and on the ground, and their soils become richer in organic matter. These qualities, aided by the activities of beavers and the absence of roads, log landings, manufactured impervious surfaces, and culverts, contribute to keeping water in the woods, especially during the high rainfall events that are increasingly common as the climate changes.

In Wild Forests, where soil is undisturbed, mycorrhizal networks help trees share carbon with one another, even between different species. These networks become more connected the older a forest becomes and help forests react to and survive stresses, further contributing to resilience. These fungal networks are but just one example of hundreds of relationships between species that we are only beginning to understand. Allowing wild forests to develop on their own enables these relationships to rebuild after their disruption. The myriad interconnected habitats in Wildlands offer great support for flora, fauna, and fungi to survive and adapt to a changing climate.

As described in a report by New England Forestry Foundation, "undisturbed forest reserves provide scientists the best laboratories to investigate and monitor the intricate and complex ecological relationships and processes of forest ecosystems. They provide ecological benchmarks to compare with managed forest stands." This understanding is critical for anyone managing land, whether passively or actively.

The opportunity to experience towering trees, the richness and subtlety of natural sounds, and the astounding diversity of life, replenishes our spirits and lays the foundation for durable, reciprocal relationships between people and nature. An increasing body of research confirms the benefits of wild places to human mental and physical health.

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Our forests are not
“one size fits all.”
We need some forests
for wood fiber and some
that are left alone
to evolve as they will.
Where are the wild forests
in your community?

The **Old-Growth Forest Network,** a national nonprofit organization, is dedicated to the protection and recovery of our nation's old-growth forests. We work to identify a national network of protected, publicly accessible forests for climate protection, species and ecosystem conservation, education, enjoyment, and inspiration. In addition, we educate the public about the characteristics and ecological importance of old-growth forests and speak out for their preservation.

Learn about the hundreds of forests in the Old-Growth Forest Network and how you can join our growing network of forest supporters.
www.oldgrowthforest.net

For more information, please check out
How to Save a Forest Toolkit:
www.oldgrowthforest.net/how-to-save-a-forest

ABOUT THE AUTHORS

Joan Maloof, Ph.D.
Salisbury University, Professor Emeritus;
Old-Growth Forest Network, Founder
joan@oldgrowthforest.net

Nick Sanchez
Certified Forester –
Society of American Foresters;
Old-Growth Forest Network,
Network Manager
nick@oldgrowthforest.net