



Framing the Issues Affecting Northern Forests

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PEOPLE IN THE North are concerned about forests, especially the forests near to them. Concerns reflect their diverse connections to forests and the many ways that rural and urban forests affect their quality of life.

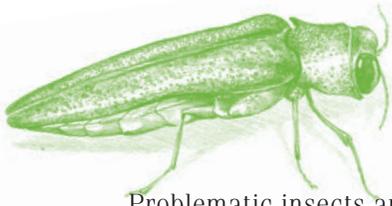
A recent analysis by Dietzman et al. (2011) summarized more than 700 comments about issues facing northern forests. The comments came from 74 print and online sources including Federal and State government planning and resource publications; scientific papers; and issue statements from nonprofit

organizations, industry, professional associations, and universities. More than 90 percent of the sources were published between 2004 and 2009. The Dietzman et al. (2011) analysis identified 55 issues that were cited multiple times. Subsequent sections in this chapter address each of the 12 most frequently cited issues in more detail.

Comparison of the issues summarized by Dietzman et al. (2011) with those presented in the 2010 State forest action plans across the North (USDA FS and NAASF 2011) shows strong alignment. State Forest Action Plans for the North identify four additional widespread issues that also are found in the second tier of issues identified by Dietzman et al. (2011): urban and community forest health and sustainability; climate change; wildfire threats to forests, public safety, and property; and state and private capacity for forestry. These are addressed elsewhere in this report.

Issues of Concern Identified with Northern Forests

- Insects and diseases
- Invasive species
- Management standards and practices
- Forest area, species composition, and size structure
- Stewardship and forest management
- Wildlife habitat and biodiversity
- Forest fragmentation and parcelization
- Water
- Wood products
- Environmental literacy
- Recreation
- Biomass and bioenergy



INSECTS AND DISEASES, INCLUDING INVASIVES

Problematic insects and diseases in the North include native as well as nonnative, invasive species. Two invasive insects of great concern are the emerald ash borer (*Agrilus planipennis*), which is spreading rapidly and has the potential to kill billions of ash trees (*Fraxinus spp.*); and gypsy moth (*Lymantria dispar*), which is already established on millions of acres of northern forest but now spreading more slowly due to some effective control measures. Other invasive insects of concern include the Asian longhorned beetle (*Anoplophora glabripennis*), fire ant (*Solenopsis invicta*), beech scale insect (*Cryptococcus fagisuga*), and the hemlock wooly adelgid (*Adelges tsugae*). Spruce budworm (*Choristoneura fumiferana*) is a native insect of particular concern.

Introduced invasive species such as the emerald ash borer cause widespread mortality to susceptible tree species. This alters the species diversity and succession in rural forests and may result in loss of forest productivity. When urban or community trees are affected, there are large expenses associated with mitigation, tree removal, and replanting.



Native diseases and decline complexes of concern include tubakia leaf spot (*Tubakia dryina*), bacterial leaf scorch (*Xylella fastidiosa*), oak decline, hickory decline, oak tatters, and oak wilt. Invasive diseases of trees include chestnut blight (*Endothia parasitica*), Dutch elm disease (*Ophiostoma ulmi* (syn. *Ceratocystis ulmi*)), and dogwood anthracnose (*Discula spp.*). Butternut canker is caused by a fungus (*Sirococcus clavigignenti-juglandacearum*) of undetermined origin. Thousand cankers disease of black walnut was recently discovered in the North; it is caused by the walnut twig beetle (*Pityophthorus juglandis*) in association with two types of fungi.

These insects, diseases, and decline complexes affect forest health, economic value, fuel load, wildfire risk, biodiversity, and future species composition. The economic losses associated with insects and diseases can be amplified in populated areas where dead or dying street and shade trees must be removed and replaced at high cost.



INVASIVE PLANTS

Through aggressive establishment, rapid growth, and efficient dispersal, invasive plant species can displace native forest plants. This can reduce forest health, degrade habitat quality, and/or impart economic losses to the recreation, timber, wood products, and nursery industries. Invasive plants of concern in the North include spotted knapweed (*Centaurea biebersteinii*), tree-of-heaven (*Ailanthus altissima*), Russian olive (*Elaeagnus angustifolia*), multiflora rose (*Rosa multiflora*), garlic mustard (*Alliaria petiolata*), and bush honeysuckle (several *Lonicera* spp.). These and other invasive plant species of concern vary geographically in their impact. Where invasive plants occur in abundance, their management often diverts time and money from other issues. Management options for invasive species can include barring entry, removing new outbreaks, and slowing or stopping propagation across the landscape.

MANAGEMENT STANDARDS AND PRACTICES

Management practices and standards include voluntary or mandatory regulations or policies intended to improve forest operations on the ground. They can cover a wide range of topics including silvicultural prescriptions, prescribed burning, soil protection, operations in riparian zones, water crossings, roads or trails, and use of herbicides. Some standards are formalized as best management practices or through a formal forest certification process.

Written management plans are usually necessary to guide the implementation of the standards and practices for individual forest tracts. Relevant, timely information for development and monitoring of standards and practices is necessary to ensure their effectiveness.

FOREST AREA, SPECIES COMPOSITION, AND SIZE STRUCTURE

Total forest area in the North has been stable, and wood volume has been increasing for decades. Although these trends are seen as positive, they are not uniform across all States. Forest acreage near cities is being lost, but forest area is being gained elsewhere, often due to natural reforestation of former agricultural lands. Maturation of northern forests has resulted in losses of early successional tree species—aspens (*Populus grandidentata* and *Populus tremuloides*), paper birch (*Betula papyrifera*), jack pine (*Pinus banksiana*), balsam fir (*Abies balsamea*), and others—with corresponding increases in shade tolerant species. Other tree species have fallen below their historical abundance of a century ago, including oaks (*Quercus* spp.), yellow birch (*Betula alleghaniensis*), cottonwood (*Populus deltoides*), red pine (*Pinus resinosa*), white pine (*Pinus strobus*), shortleaf pine (*Pinus echinata*), and loblolly pine (*Pinus taeda*). These changes are closely linked to past forest management practices including harvest methods, harvest intensity, and wildfire management.

Wildlife management is a related concern, because in many areas, excessive deer browsing has become a barrier to regenerating desirable tree species. Concerns have also been raised about declining tree quality for timber and about scarcity of old-growth, woodland, and savanna habitats. All these changes are also related to sustaining biodiversity.

STEWARDSHIP AND FOREST MANAGEMENT

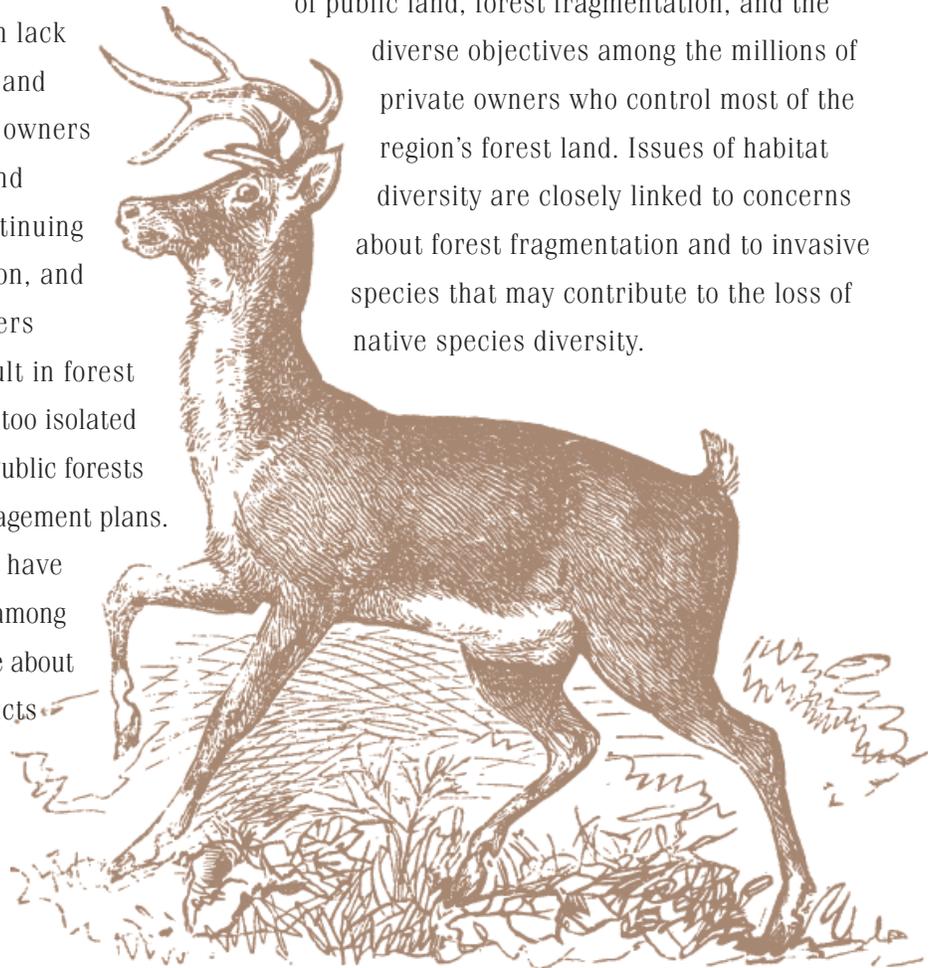
Forest stewardship—resource management and administration that maintain forests in a healthy condition for future generations—is a challenging process that is further complicated by forest ownership patterns in the North.

Most of the nearly 5 million family forest owners in the region lack forest management plans, and providing so many private owners with timely information and assistance is difficult. Continuing fragmentation, parcelization, and urbanization can be barriers to stewardship if they result in forest tracts that are too small or too isolated for effective management. Public forests typically have detailed management plans. However those plans often have been the subject of conflict among interest groups that disagree about appropriate mixes of products and ecosystem services from public lands.

WILDLIFE HABITAT AND BIODIVERSITY

The complex issue of biodiversity encompasses virtually all forest-associated plants and animals at genetic, species, community, and landscape scales. Individual threatened and endangered species are often the focus of special attention, but the objective of biodiversity conservation is to maintain viable native animal and plant populations of all kinds. Losses of early-successional forests, old forests, oak forests, savannas, woodlands, and prairies are landscape-scale issues of particular concern. Management to maintain diverse habitats and connectivity among habitats is complicated by the general scarcity of public land, forest fragmentation, and the

diverse objectives among the millions of private owners who control most of the region's forest land. Issues of habitat diversity are closely linked to concerns about forest fragmentation and to invasive species that may contribute to the loss of native species diversity.





FOREST FRAGMENTATION AND PARCELIZATION

Forests become fragmented through conversion to other uses, such as agriculture or residential development. Fragmentation typically results in smaller tracts of forest land scattered across the landscape or in more nonforest openings within predominantly forested landscapes. Either situation results in more forest edge habitat, less forest interior habitat, and fewer forested corridors connecting large forested parcels. Thus, movement of plants, animals, and water across the landscape is altered. Increased forest edge affects habitat suitability for plant and animal species, almost always to the detriment of species that depend on forest-interior habitat. Forest-associated plant and animal populations that become isolated within in a fragmented landscape can lose genetic diversity. The specific causes and effects of fragmentation vary from the heavily forested areas of Maine and the Lake States to agricultural areas in Iowa or Illinois and to suburban and exurban zones in proximity to cities.

Parcelization, the subdivision of tracts into smaller and smaller ownerships, does not necessarily fragment the forest physically; rather, it spreads forest management decisions to more owners who have smaller properties. This complicates the pursuit of landscape-scale management objectives, such as controlling invasive species or improving habitat for wide-ranging animals, as well as increasing the cost and complexity of providing information and assistance to a growing number of private forest owners.

WATER

Forests play a crucial role in maintaining water quality and quantity. They protect large portions of the region's watersheds, including crucial headwaters and floodplain areas. Because the quality of water from forested areas is typically higher than from agricultural or developed areas, many municipal water supplies are directly or indirectly dependent on forests. At the landscape scale, forest land provides an increasing proportion of the water supply for northern communities. Consequently practices that eliminate forests or impair their ability to protect watersheds are of great concern.

WOOD PRODUCTS HARVESTING, PROCESSING, CONSUMPTION, AND TRADE

The forest products industry is important to the economy in many northern communities. Increasingly, the industry is affected by global issues including demand and prices for imported and exported wood and the relative cost and quality of domestic versus foreign manufactured wood products. Emerging wood-based bioenergy markets have the potential to compete with other industries for wood resources.

In some situations forest products harvesting can be joined with other complementary conservation goals. For example, harvesting forest products can offset costs associated with restoring habitat, increasing biodiversity, limiting damage from insects or diseases, and responding to damage from severe weather.

Balancing the size of the forest products industry with other complementary and competing interests remains a concern in the North. Despite decades of increasing wood volume in northern and U.S. forests, the Nation is a net importer of wood and wood products. A growing population continues to increase consumption pressure and, through imports, push the consequences, good and bad, of timber harvesting to other nations. This is a wood products issue, an environmental literacy issue, and a forest sustainability issue.

ENVIRONMENTAL LITERACY

A well informed public is considered essential for developing and supporting sound practices and policies to manage northern forests and sustain them for future generations. Environmental literacy encompasses efforts to increase public awareness of forests and forestry practices.



An increasingly urban society can become increasingly disassociated from the products and ecosystem services supplied by forests, but improved environmental literacy is important for all demographic groups. Progress in improving environmental literacy

may require changes in the way natural resource professionals and other educators interact with the public.

OUTDOOR RECREATION

Demand for recreation opportunities in forests is growing, especially in forests that are close to residential areas. However, there are concerns about how to provide the full spectrum of outdoor recreation opportunities while minimizing damage to the resources caused from heavy recreational uses. Demand for recreational uses includes developed, semi-primitive, and wilderness areas; on water; and using motorized and nonmotorized transportation. Off-road vehicle recreation, in particular, affects soil, vegetation, water resources, and competing recreational activities; common concerns include keeping riders within designated areas and managing roads and trails. Increasing the economic returns from recreation and tourism industries is generally considered beneficial if doing so maintains a desirable mix of recreational opportunities. The relative scarcity of public lands in the North exerts great recreational pressure on public forests and associated facilities. Building and maintaining public recreational facilities is becoming more expensive as demand for those facilities is increasing. The preponderance of private forest land in the North makes effective management of these lands crucial to maintaining the scenic quality of landscapes. Although privately owned forests provide recreation opportunities for the millions of private forest landowners and their associates, public access to private forest land has, historically, been limited.

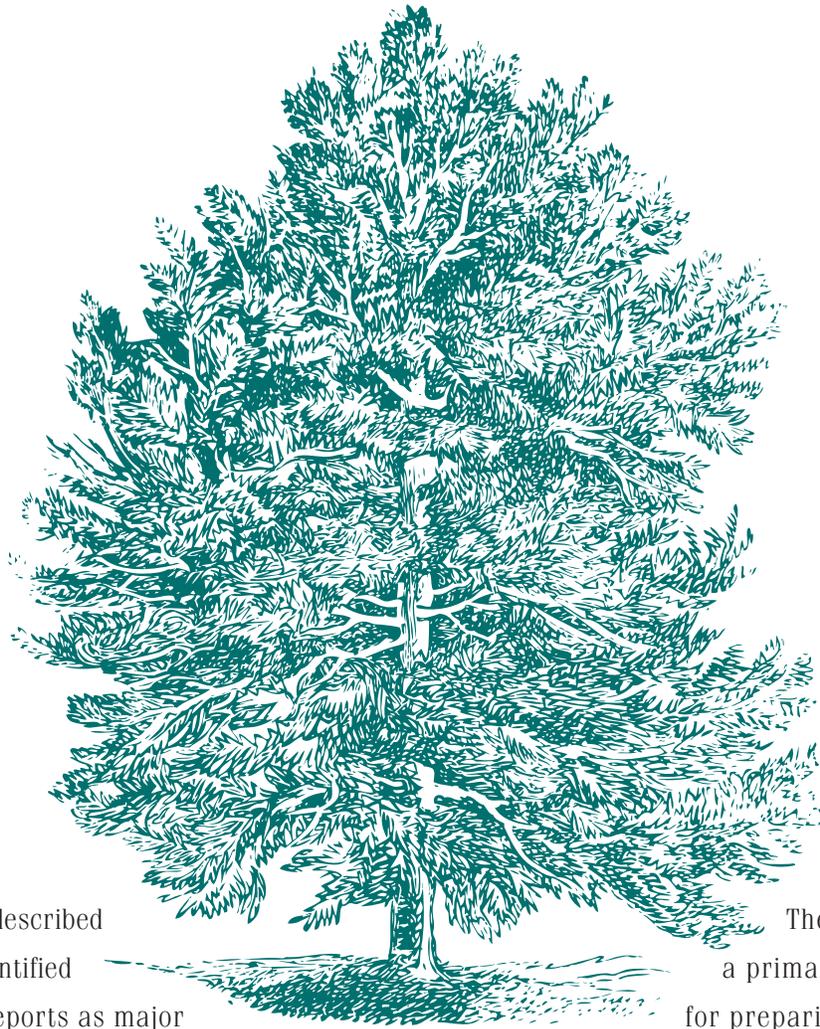


The interaction of people and forests in the North creates resource conflicts as well as opportunities to improve people's lives



BIOMASS AND BIOENERGY

Increased use of woody biomass for energy has the potential to greatly alter the type and quantity of wood that is utilized from northern forests, but great uncertainty exists about the future of biomass and bioenergy in the region. Some concerns are associated with trying to ensure that local bioenergy markets develop. If markets develop, other concerns are associated with maintaining existing relationships among wood suppliers and users; ensuring appropriate harvest levels; and sustaining water quality, biodiversity, and other ecosystem services.



SUMMARY

The 12 issues described above were identified in published reports as major concerns about northern forests (Dietzman et al. 2011). Some are longstanding. They are all complex issues, and many are integrally linked to broader societal concerns about the economy, renewable energy, and climate change. Some issues are inherently threatening, such as invasive plants, insects, and diseases. Others are multifaceted and include both threats and opportunities, such as the interaction of wood products and wood energy production with biodiversity, fragmentation, and carbon sequestration.

These issues are a primary motivation for preparing this assessment of northern forest conditions. The following chapters provide necessary background information for discussing these issues in more detail, putting the region in context with the rest of the United States, understanding how forest conditions vary regionally and over time, considering resource interactions, and exploring opportunities associated with future courses of action or inaction.