



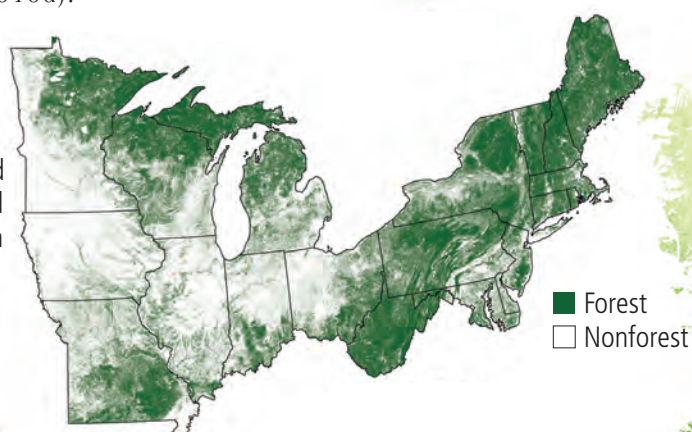
Introduction



THE **TWENTY STATES** that make up the U.S. North are bounded by Maine, Maryland, Missouri, and Minnesota (Fig. 1). Compared to the rest of the country, the North has a higher population density, relatively little public forest land, and many private forest owners with small forest tracts. Fifty-five percent of northern forest land belongs to nearly 5 million family forest owners. Management intensity for these forests is relatively low—only 16 percent of family forest land is covered by a written management plan (Butler 2008, Smith et al. 2009, USDA FS 2009b, USDA FS 2010d).

NORTH

42% of land is forested
32% of U.S. timberland
41% of U.S. population



Alaska

PACIFIC COAST

37% of land is forested
14% of U.S. timberland
16% of U.S. population



Hawaii

INTERIOR WEST

20% of land is forested
14% of U.S. timberland
9% of U.S. population



SOUTH

40% of land is forested
40% of U.S. timberland
34% of U.S. population

Puerto Rico

The Northern States

Connecticut	Missouri
Delaware	New Hampshire
Illinois	New Jersey
Indiana	New York
Iowa	Ohio
Maine	Pennsylvania
Maryland	Rhode Island
Massachusetts	Vermont
Michigan	West Virginia
Minnesota	Wisconsin

Washington, D.C. is included in calculation of urban and community forest statistics

FIGURE 1

Distribution of forests and people in the United States (Homer et al. 2004, Smith et al. 2009, and U.S. Census Bureau 2010).

Forest management and policies intended to meet current and future needs of people in the North require good baseline information about current conditions and trends. The information in this assessment helps put the capabilities and limitations of northern forests in perspective with the rest of the Nation. For example:

- The North is the most heavily forested region of the United States—42 percent of the landbase is forested (Table 1, Fig. 1). It is more heavily forested than the South (40 percent), the Interior West (20 percent), the Pacific Coast (37 percent), or the overall U.S. (33 percent).
- With only 18 percent of total land area, the North supports 32 percent of the Nation's timberland (forest land that is sufficiently productive and sufficiently accessible to produce commercial crops of wood and that is not otherwise restricted from timber harvest by policy or legislation such as designated wilderness or parks).
- In the last century, northern forest land increased from 134 to 172 million acres (Fig. 2) while total U.S. forest land remained essentially unchanged. This trend is attributable to a historical pattern

Table 1—Selected characteristics associated with northern forests, compared to forests in the entire United States (Smith et al. 2009; U.S. Census Bureau 2007, 2009).

Characteristic	U.S. total	Northern States (with percent of U.S. total when applicable)
Population (million)	304	124 (41)
Number of private forest owners (million)	11	5 (44)
Employment in forestry and logging, wood products, and pulp and paper industries (thousand workers)	1,097	441 (40)
Total land area (million acres)	2,264	414 (18)
Forest land area (million acres)	751	172 (23)
Timberland area (million acres)	514	164 (32)
Percent forest land (percent of total land)	33	42
Percent timberland (percent of total land)	22	40
Percent urban land (percent of total land)	3.1	6.0
Forest land per person (acres)	2.5	1.4
Volume of timber (billion cubic feet)	1,013	268 (26)
Annual growing stock growth (billion cubic feet)	26.7	6.7 (25)
Annual growing stock removals (billion cubic feet)	15.5	3.6 (18)
Annual growing stock mortality (billion cubic feet)	7.8	2.4 (31)
Ratio of annual growth to removals	1.7	1.9

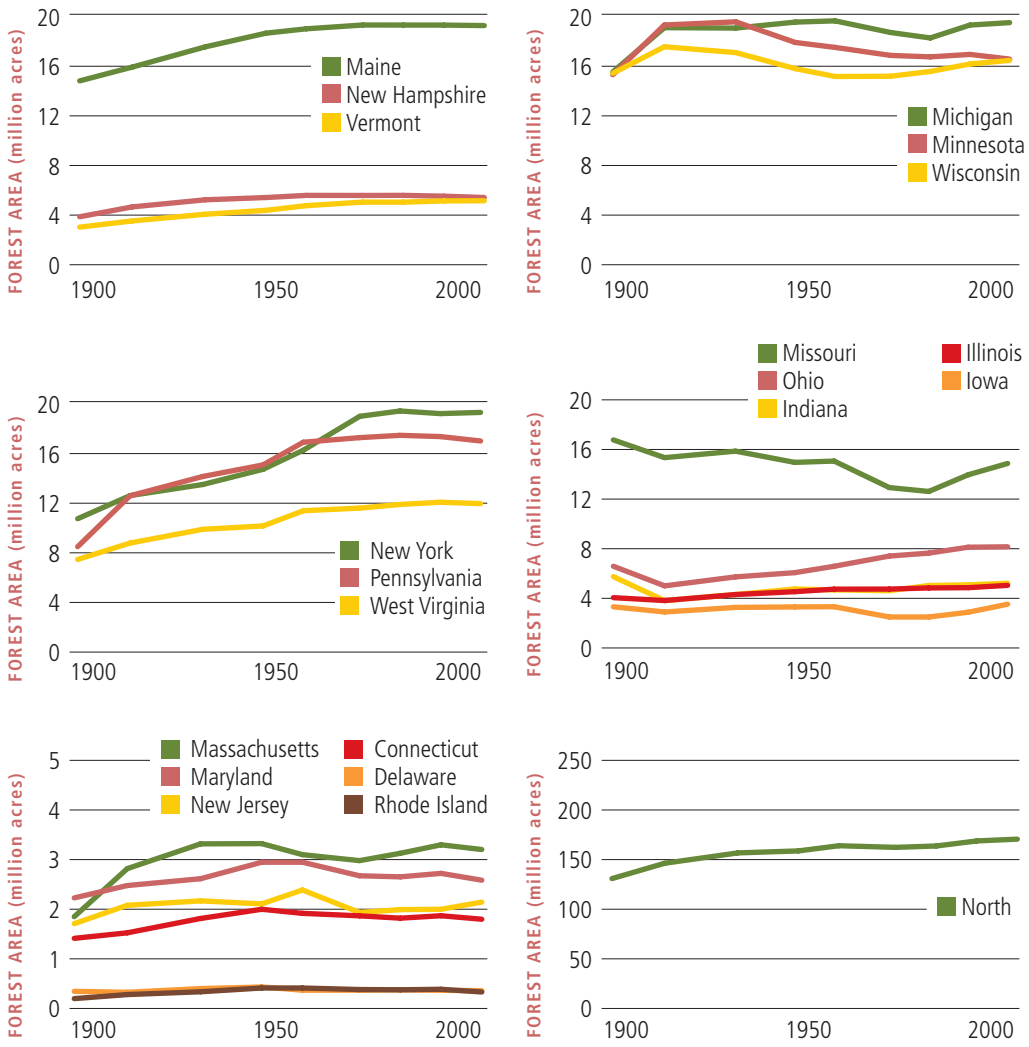


FIGURE 2
Forest area by State
from 1907 to 2007
(Smith et al. 2009).

of forest harvest, land clearing, farming, farm abandonment, and urbanization that continues to exert influence today.

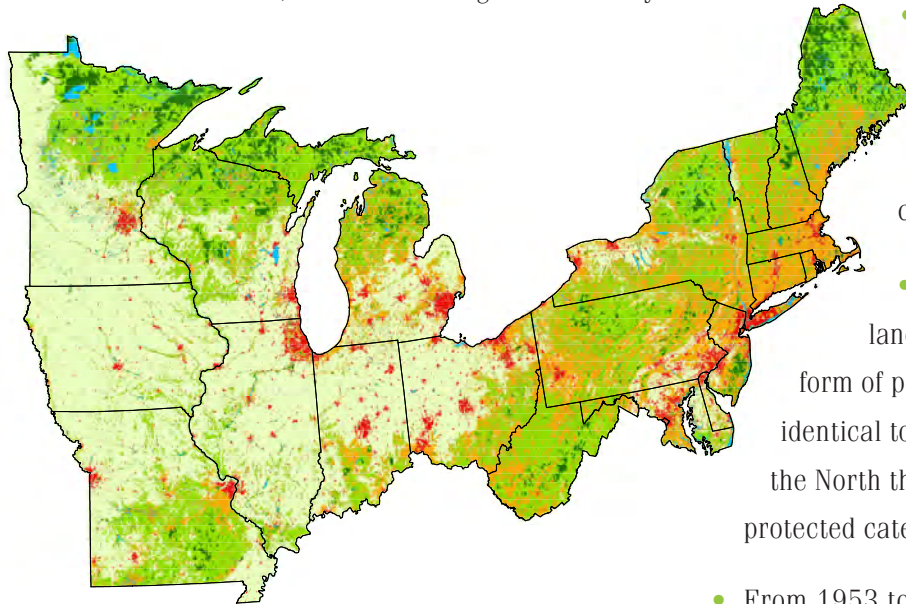
- The North hosts 41 percent of the Nation's population; 80 percent of the North's population lives in urban areas.
- Over the last century, population increased from 52 to 124 million people in the North. The number of forested acres per person decreased from 2.6 acres in 1907 to 1.4 acres in 2007, although total northern forest area

increased. The national average is 2.5 acres of forest per person.

- The North has large areas of wildland-urban interface (WUI) compared to the rest of the United States (Fig. 3).
- Urban areas in the North cover 6 percent of the land base (compared to 3 percent nationally). Northern urban areas are expanding by about 4 million acres per decade, and 37 percent of that expansion (1.5 million acres) is into forest cover.

- Current statewide tree mortality rates are 1 to 2 percent of total volume per year, but native and invasive insects and diseases can cause severe, localized damage or mortality.

Introduction of new invasive species is an ongoing threat to forest health in the North and in the rest of the United States.



WILDLAND-URBAN INTERFACE (WUI)

WUI

Orange Intermix and interface

NON-WUI VEGETATED

Green Very low density housing
Dark green No housing

NONVEGETATED OR AGRICULTURE

Red High and medium density housing
Light green Low and very low density housing
Blue Water

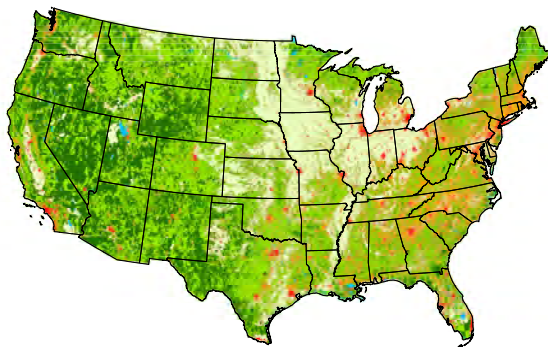


FIGURE 3

The wildland-urban interface (Radeloff et. al 2005). The majority of the area of wildland-urban interface and intermix occurs in the eastern United States.

- Across the North, 48 percent of the water supply (280 billion cubic meters per year) originates on forest lands, compared to 53 percent nationally.

• In the North, one acre of forest land in six (16%) is afforded some form of protected status. That is nearly identical to the national proportion, but in the North those forests are concentrated in protected categories with fewer restrictions.

- From 1953 to 2007, the volume of standing timber in the North increased by about 140 percent (from 104 to 248 billion cubic feet), compared to about 50 percent (from 616 to 923 billion cubic feet) nationally.
- Annual volume growth of northern forests was about 6.6 billion cubic feet for State inventory cycles completed through 2008. Annual volume growth is 1.9 times greater than the rate of harvesting and other removals, compared to 1.7 times nationally.
- People in the North consume the equivalent of 8.8 billion cubic feet of wood products each year or about 71 cubic feet per person, most of which is harvested and processed elsewhere.
- The region currently employs 441,000 in the forestry, logging, wood products, and pulp and paper industries—about 40 percent of all U.S. jobs for these sectors.



The Wood You Consume

Forests provide people with wood products they use daily as well as many other ecosystem services. Major categories of wood products include sawn wood (lumber), wood panels (such as plywood, particle board, and oriented strand board), engineered wood products (such as laminated veneer lumber, wood composites, and I-joists), paper, and paperboard. Wood is also used as a source of energy to heat buildings and generate electricity. Wood may soon be used to create liquid fuels.

Annual per capita consumption of wood and wood products amounts to roughly:

- 410 pounds of paper
- 330 pounds of boxes, packaging, and other pulp products
- 75 square feet of plywood
- 25 square feet of particleboard and fiberboard
- 235 board feet of lumber
- 2 shipping pallets

Although it is convenient to split the Nation into four quadrants to facilitate regional comparisons (Fig. 1), there is also substantial diversity in forest conditions among Northern States. For example, Maine and Iowa both have comparatively low population density with more than 12 acres of total land area per capita. But Maine is 89 percent forest covered, compared to only 8 percent in Iowa (Fig. 4). Forest area per person ranges from a high of 13.4 acres in Maine (only exceeded by Alaska, Montana, Wyoming, and Idaho) to a low of 0.2 acres in New Jersey (the least of any State nationwide) (Fig. 5).

Beyond variations in forest resources, Northern States also differ in climate, geology, and native vegetation. These differences are reflected in the 11 ecological provinces (Fig. 6) that define areas with similar ecological characteristics (Bailey 1997, McNabb and Avers 1994). For example, there are large ecological differences from the central Appalachian broadleaf and coniferous forests that span across the mid-Atlantic to the Laurentian mixed forests that cover the Northern Great Lakes States. Variations also exist within individual States.

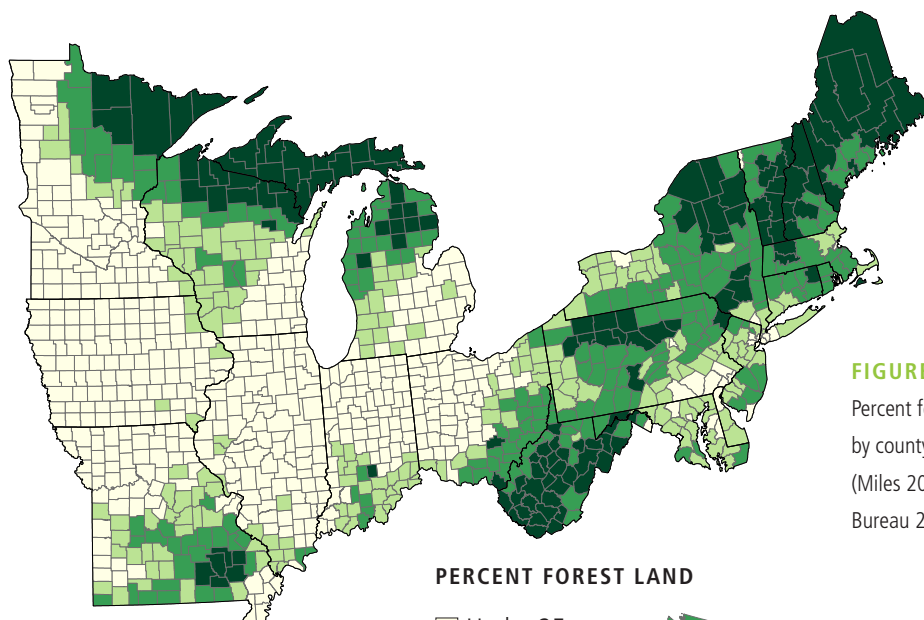


FIGURE 4
Percent forest area
by county and State
(Miles 2010, U.S. Census
Bureau 2010).

PERCENT FOREST LAND

- Under 25
- 25 to 50
- 51 to 75
- More than 75

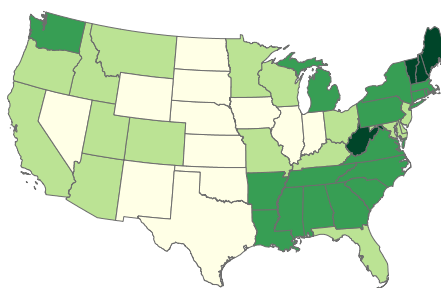
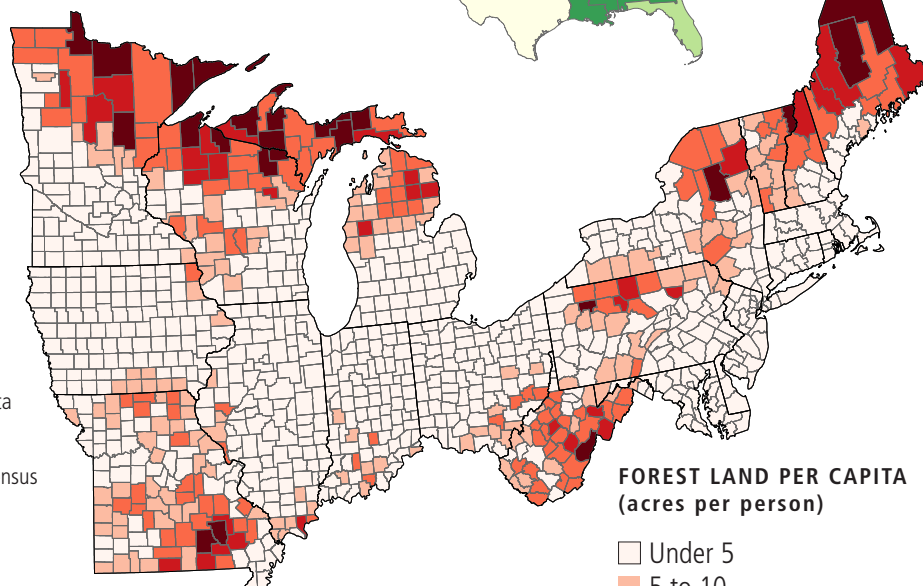
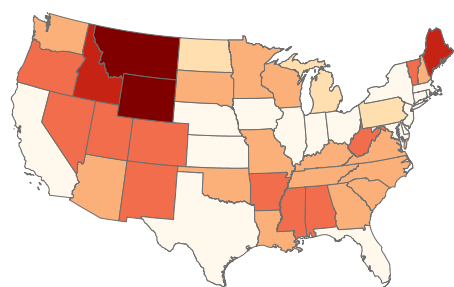


FIGURE 5
Forest area per capita
by county and State
(Miles 2010, U.S. Census
Bureau 2010).



**FOREST LAND PER CAPITA
(acres per person)**

- Under 5
- 5 to 10
- 11 to 25
- 26 to 50
- Over 50



**FOREST LAND PER CAPITA
(acres per person)**

- Under 1
- 1 to 2
- 3 to 5
- 6 to 10
- 11 to 20
- Over 20



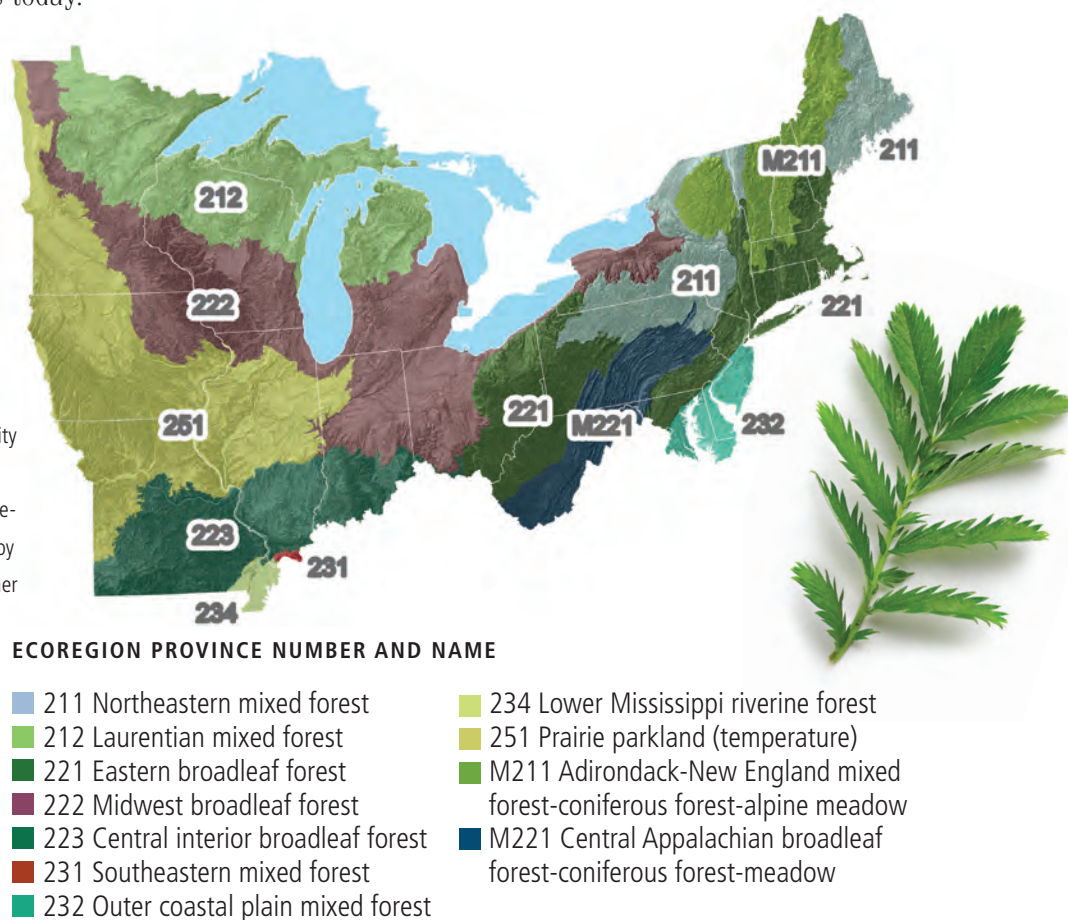
Four of the 10 largest metropolitan areas in the Nation occur in the North—New York, Chicago, Philadelphia, and Boston. In total, 80 percent of the region’s population lives in urban areas. They, as well as everyone else, depend on the region’s forests for wood and wildlife; for vital ecosystem services such as the provision of clean air, clean water, climate control, and biodiversity; and for recreation. Because of their close proximity to people, trees and forests within urban areas demonstrably enhance quality of life for urban residents.

Understanding forests requires a long-term perspective. Forest management practices implemented decades ago in northern forests have an impact on forests today.

Similarly, decisions made now about how, when, and where to manage northern forests will have impacts on forest resources and communities for decades to come. Understanding forests also requires the ability to see forests at multiple spatial scales. These scales include the local forest stand or management area, landscapes comprised of many forest stands covering thousands of acres, and ecoregions comprised of thousands of landscapes covering millions of acres. Political scales include local governments affecting local land-use planning, individual States that make policies governing forests within their borders, and groups of States whose shared interests in forest issues extend beyond their borders.

FIGURE 6

Northern ecoregion provinces, based on similarities in climate, topography, geology, and native vegetation (Bailey 1977, McNabb and Avers 1994); ecoregions can be split into smaller units or combined into larger units. Because of the relative uniformity of conditions within an ecoregion, it often makes sense to discuss large-scale management and policy issues by ecoregions as well as by States or other political boundaries.



All forest management decisions, including the decision to do nothing, are implemented at the local scale—usually within a forest stand comprised of a few dozen acres. However, those acres are part of the larger forest landscape, and collectively management decisions have broad and cumulative impacts in the region and beyond. The combined effects of thousands or millions of individual decisions that are perfectly logical at the local scale may prove undesirable when accumulated across landscapes, ecoregions, States, the region, the Nation, and ultimately the World. Examples might include management practices that facilitate the replacement of native species by nonnative plants or animals, allow the spread of destructive insects or diseases, increase the risk of wildfire, reduce opportunities for urban residents to enjoy forests, or reduce economic opportunities in rural communities.

Northern forests are constantly changing. Many of those changes are the result of natural processes such as forest aging, species succession, and weather-related disturbances, but some processes may be perceived as threats. These include insect and disease outbreaks, conversion of forest land to other uses, and global climate change. Other processes such as the increasing volume of wood may be perceived as opportunities.

Still others can be a complex mix of opportunity and threat. For example, demand for renewable energy could lead to integrated forest management practices designed to supply renewable woody bioenergy feedstock while

simultaneously improving forest health and wildlife habitat, or short-term excessive wood removal for energy could create undesirable consequences for long-term forest sustainability.

Despite some notably positive trends in northern forests, concerns and issues are numerous. Many regional issues of concern are summarized in Chapter 2, followed by definitions of sustainable forestry (Chapter 3), characteristics of sustainable forests (Chapter 4), and analyses of conditions and trends based on indicators of forest sustainability for the region (Chapter 5). Chapter 6 discusses some complex, overarching issues in the region and the potential contributions of various stakeholders in addressing them.

The way in which northern forests change in the future will affect their ability to provide products, amenities, and ecological services. Insights expected from the projections and analyses associated with the Northern Forest Futures Project should be useful in guiding policies and management practices toward a desirable future for northern forests. Forest resources and ecosystem services can improve the quality of life for people and communities without diminishing the capacity to provide similar benefits to future generations—the principle that is at the heart of forest sustainability.

