



Legal, Institutional, and Policy Framework for Forest Conservation and Sustainable Management

9

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Introduction

CONE CONCLUSION FROM the 50-year forest projections described in Chapters 2 through 8 is that some of the most dramatic changes to the forests of the North will be the direct result of human activities, including land-use change, forest management, greenhouse gas emissions, and invasive species introductions. The tools that society will have available to influence the type and intensity of these and related human activities will draw from a complex mix of legal, institutional, and policy frameworks.

The concepts in this chapter provide a context for the prior chapters of this report and for future policies and decisions about forest conservation and management. As described by the Montréal Process Working Group (n.d.):

Legislation, institutional capacity, and economic arrangements, with associated policy measures at both national and subnational levels, create an enabling environment for the sustainable management of forests. Reporting against these indicators contributes to raising public and political awareness of issues affecting forests and builds support for their sustainable management.

Unlike previous chapters, the indicators for the legal, institutional, and policy frameworks are largely descriptive (Table 9.1). For example, predicting how forest-associated laws, regulations, and policies will change with any degree of certainty is not possible. This chapter describes the forest ownership patterns that have a direct impact on legal, institutional, and policy frameworks, and then summarizes salient recent developments for each indicator and the trends that will likely influence their future direction.



Key Findings

- The impact of the legal, institutional, and policy framework differs enormously between publically managed forests and those held by private owners; three-quarters of the forest land in the North is privately owned, mostly by families and individuals.
- Numerous laws, policies, and regulations affecting forest-land management have been enacted at national and State levels; Best Management Practices, which are in place across the North, are periodically reviewed and updated.
- More than 30 million acres of forest land across the North are certified under one or more forest certification systems; the future of these programs depends on the demand for certified products, the requirements imposed by the various certification programs, and the willingness of landowners to participate.
- An estimated 7.2 million acres of forests and nonforested (primarily agricultural) land are enrolled in conservation easement programs across the North; enrolled acreage has been increasing substantially and will continue to do so as long as owners see this as a viable option and organizations see value in acquiring and holding the easements.
 - Of all tax policies, those governing property taxes have the greatest potential to influence the behavior of family forest owners; although all Northern States have programs that can help defer or reduce annual property taxes on forest land, the future of tax policies is unknown and will likely hinge largely on issues that are larger than forestry.
- For owners that are primarily interested in financial gain, taxes can have an important impact—tax policies are one factor that led to the shift from vertically integrated forest companies (companies that own both forest land and the mills that processed timber from that land) to real estate investment trusts and timber investment management organizations.
- To augment the private natural resource professionals across the North, numerous programs and services have been established including cost sharing; technical assistance; financial incentives; and delivery of tools, training, and publications. For example, 9 percent of the nonindustrial private forest land—land not owned by forest products companies—is managed under a management plan associated with the Forest Stewardship Program of the U.S. Forest Service. Forestry assistance programs will continue to evolve to meet changing needs and the reality of decreasing budgets, continuing the trend of prioritizing where and how limited resources are spent.
- Partnerships among various institutions and organizations have become increasingly common for addressing large-scale, complex issues; this trend is likely to continue in the future.
- Public input on strategic-level forest management decisions is common on public lands and is increasingly common on large private holdings, especially those enrolled in certification programs; a continuing push for transparency in decisionmaking will likely cause an increase in public participation.



Table 9.1—Indicators of legal, institutional, and economic framework for forest conservation and sustainable management of temperate and boreal forests under Montréal Process Criterion 7 (Montréal Process Working Group 2015).

Indicator	Rationale
7.1.a Legislation and policies supporting the sustainable management of forests	This indicator provides information on legislation and policies, including regulations and programs, which govern and guide forest management, operations, and use. Legislation and policies designed to conserve and improve forest functions and values are prerequisite to achieving the sustainable management of forests.
7.1.b Cross-sectoral policy and program coordination	This indicator provides information on the extent to which policies and programs are coordinated across sectors to support the sustainable management of forests. Nonforest sector land use and development decisions may have a significant impact on forests and their use. Cross-sector coordination of forest and nonforest related policies and programs can promote improved forest management by helping to minimize adverse impacts and by strengthening the ability of countries to respond to national and global issues.
7.2.a Taxation and other economic strategies that affect the sustainable management of forests	This indicator provides information on the economic strategies that affect the sustainable management of forests. Government policies and strategies on investment, taxation, and trade may influence both forest management and the level of long-term investment in forestry.
7.3.a Clarity and security of land and resource tenure and property rights	This indicator provides information on land, forest, and resource tenure, laws, and rights. Clear title identifies rights and responsibilities under the law with respect to land and resources, while due process ensures that these rights can be protected or disputed. Lack of clear ownership or due process may hinder the active engagement of stakeholders in the sustainable management of forests, or leave forests vulnerable to illegal or unsustainable use.
7.3.b Enforcement of laws related to forests	This indicator provides information on the extent to which forest related laws and regulations are enforced. The ability to successfully prosecute offenders is essential in combating harmful activities that may threaten forests and their sustainable management (e.g., illegal forest conversion and illegal logging).



Table 9.1 continued



Indicator

Rationale

7.4.a Programs, services, and other resources supporting the sustainable management of forests

This indicator provides information on the capacity of both government and private organizations to deliver programs and services, to maintain and develop infrastructure, and to access the financial and human resources necessary to support the sustainable management of forests.

7.4.b Development and application of research and technologies for the sustainable management of forests

This indicator provides information on the capacity to develop and incorporate new science, research, and technologies into forest management. Continuous improvement in the depth and extent of knowledge and its application will help ensure advances in the sustainable management of forests.

7.5.a Partnerships to support the sustainable management of forests

This indicator provides information on partnerships and their contribution to the sustainable management of forests. Partnerships may help create a shared purpose and are important tools in building capacity; leveraging financial, technical, and human resources; strengthening political commitment; and in developing public support to advance the sustainable management of forests.

7.5.b Public participation and conflict resolution in forest-related decisionmaking

This indicator provides information on the processes that promote public participation in forest-related decisionmaking and reduce or resolve conflict amongst forest stakeholders. Public participation in decisionmaking processes and conflict resolution efforts can lead to decisions that are widely accepted and result in better forest management.

7.5.c Monitoring, assessment, and reporting on progress toward sustainable management of forests

This indicator provides information on the capacity to monitor, assess, and report on forests. An open and transparent monitoring and reporting system that provides up-to-date and reliable forest-related information is essential for informed decisionmaking, in generating public and political awareness of issues affecting forests, and in the development of policies to underpin the sustainable management of forests.





INFLUENCE OF FOREST OWNERSHIP PATTERNS *Current Status*

The impact of the legal, institutional, and policy framework differs enormously depending on whether one is considering public or private forest lands. Expectations for lands within these two broad ownership categories are different, and often different laws and regulations apply to each. Indeed, the legal, institutional, and policy framework is a major influence on the distribution of forest land between public and private ownerships and the protection of basic private ownership rights. As discussed in Chapter 3, these ownership patterns also influence, among other patterns and processes:

- Which lands are protected from development
- Areas where timber harvesting is prohibited
- Forest parcellation and fragmentation patterns
- The location and makeup of the wildland-urban interface.

As described in Chapter 3, forest ownership patterns vary substantially across the United States (Butler 2008) and across the North (Fig. 9.1). Three-quarters (128 million acres) of forest land in the Northern United States is privately owned; families and individuals are the dominant, private ownership category (Fig. 9.2). Other private ownerships include forest products companies and other corporations, Native American tribes, and other private groups, such as conservation organizations. Of the 44 million acres of public forest land across the region, half are managed by State governments, usually within forestry, wildlife, parks, or water agencies; a third by Federal agencies, including the U.S. Forest Service, the U.S. Fish and Wildlife Service, and the U.S. National Park Service; and the remainder by county and municipal governments, often for water protection (Chapter 6) or recreation (Chapter 8).

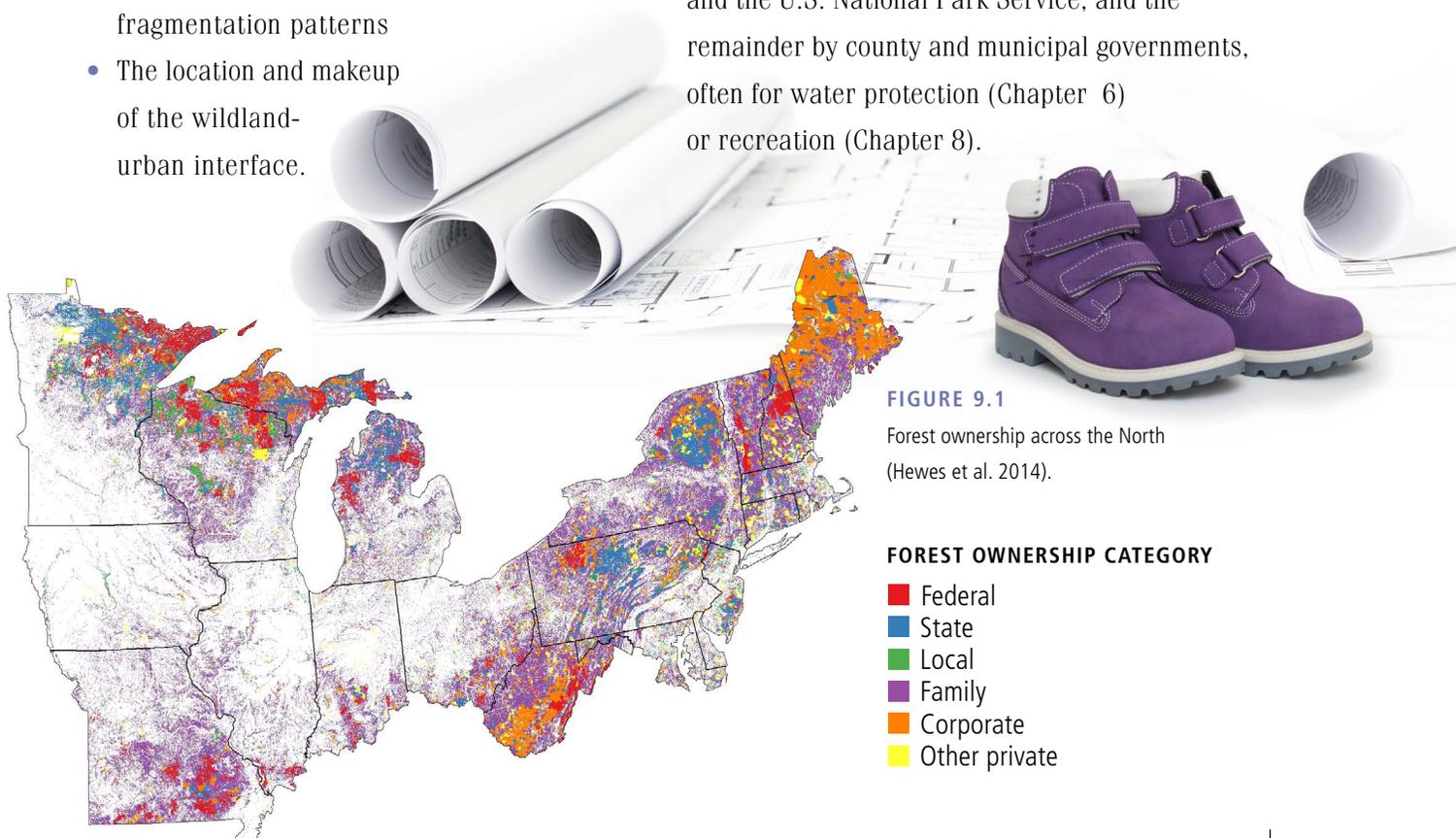


FIGURE 9.1
Forest ownership across the North
(Hewes et al. 2014).

FOREST OWNERSHIP CATEGORY

- Federal
- State
- Local
- Family
- Corporate
- Other private

From 1977 to 2007, the net area of forest land across the North increased by 7 percent, but this increase was not evenly distributed among ownership categories (Fig. 9.3). Some States experienced net decreases in private forest land, even though total forest area increased. The largest percentage increase in forest land was for State and local governments that acquired additional forest land through purchases, donations, and other transfers.

Predicted Trends

Forest land area is projected to decrease between 2010 and 2060 (Chapters 2, 3, 4). The projection methods do not explicitly model changes in forest ownership, but they assume that future losses of forest land will be from the private rather than public ownership holdings. Indeed historical trends (Fig. 9.3), combined with pressures from development and other human activities (Mondal et al. 2013), suggest that any losses of forest acreage will be concentrated on private holdings. Divestiture of public forest land has been rare, with recent trends showing increases, especially for State and local governments. An exception to the net loss in private forest land could occur in areas where continued conversion of marginal agricultural land to forest land offsets forest land lost to development (Chapter 2). The net forest gain from or loss to agricultural lands is heavily influenced by the relative prices of agricultural commodities (Alig et al. 2010). During periods when agricultural markets are depressed, unused cropland and pastureland will naturally revert to forests across most of

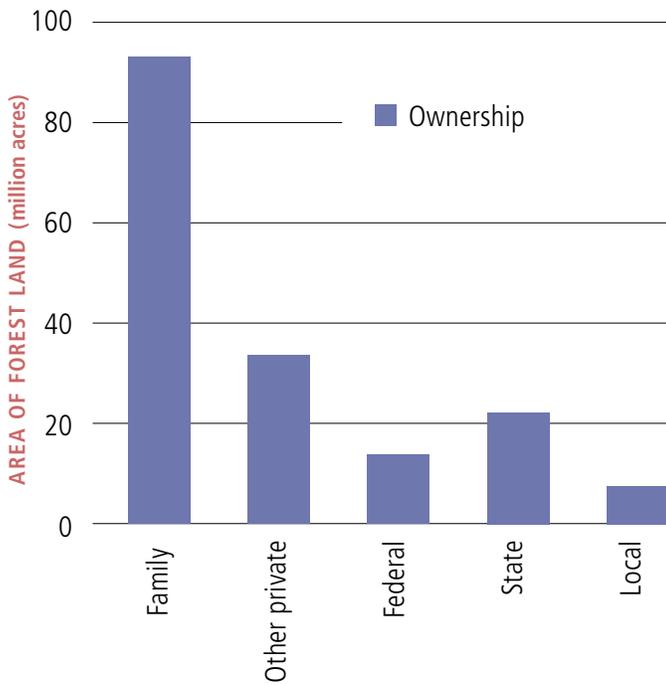


FIGURE 9.2

Forest land area by ownership category for the North, 2006 (Butler 2008).





LEGISLATION AND POLICES SUPPORTING THE SUSTAINABLE FOREST MANAGEMENT

the region. Conversely, when markets rise, forest land is more likely to be cleared and converted to agriculture. Over the long term as these cycles occur, the specific location of forest and agriculture lands can shift even though total forest area remains relatively stable. And as the “green revolution” and other efforts have allowed more food to be produced on fewer acres, millions of acres have reverted (or been actively converted) to open space, often forest land—a primary driver of the increase in forest land observed in the United States over the past century.

Numerous laws, policies, and regulations have been enacted by Federal and State governments to support sustainable forest management. At the broadest level, these policies have influenced the distribution of forest land between public and private forest ownerships. Federal laws such as the Weeks Act have enabled governments to acquire forest land; and others, such as the National Forest Management Act, have prescribed how Federal forest holdings can be managed and used (Brown 2004, Cabbage et al. 1993). Analogous state-level laws or executive orders are in place for most, if not all, of the 20 Northern States.

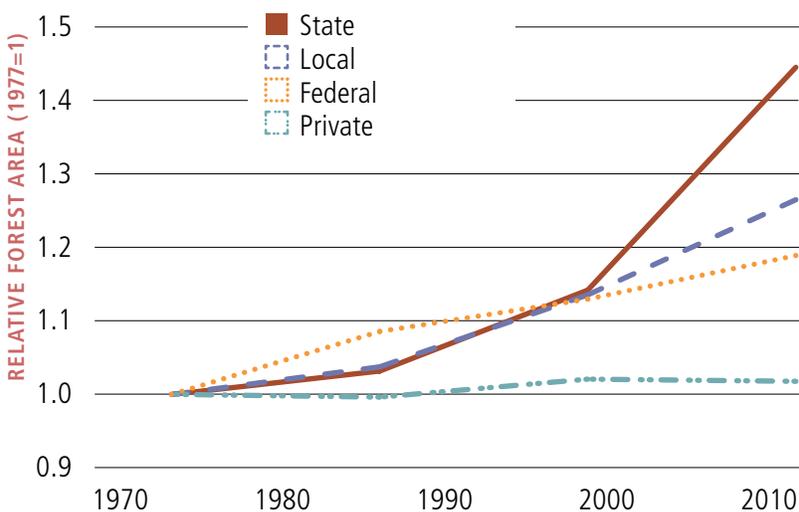


FIGURE 9.3 Relative changes in forest ownership for the North, 1977 to 2007 (Smith et al. 2009).



Current Status

Best management practices—Best management practices (BMPs) are common tools used by States to outline acceptable practices for forest operations. Many guidelines are focused on minimizing soil erosion and sustaining water quality (Chapter 6), but they can also include guidance on timber harvesting practices, forest regeneration, wildlife habitat, and aesthetic values. The specifics vary by State as to whether BMPs are voluntary or mandatory (Ellefson et al. 2001, Shifley et al. 2012). Shifley et al. (2012) summarize the general attributes of such management standards and guidelines for State and private ownerships across the region. In addition to BMPs, some States (such as Maine and Connecticut) have implemented more comprehensive forest practices laws.

Certification—Through forest certification, the private sector has initiated its own incentives for encouraging sustainable forest management. Voluntary certification programs require forest owners and managers to adhere to specific protocols intended to ensure sustainable management and to submit to periodic audits to ensure compliance. They include programs sponsored by the Forest Stewardship Council covering 27.7 million acres¹, the Sustainable Forestry Initiative covering 25.2 million acres (Sustainable Forestry Initiative, n.d.), and the American Tree Farm System covering 7.8 million acres² (Fig. 9.4), with some acres certified under more than one program. In addition to regulating field operations, required protocols

can include long-term planning, monitoring, consideration of endangered species, mitigation of invasive species, and sustaining aesthetic and cultural resources. Participation affords forest owners assurances and recognition that they are managing sustainably as well as the opportunity to market their products as such. Research has shown that these systems are making a significant difference in how forest owners manage their land (Moore et al. 2012). Although few direct market incentives, such as price premiums for certified forest products, have been received, certification can provide access to markets that require certified wood and assurances to investors that corporations are managing sustainably.

Easements and land trusts—Conservation easements are another voluntary tool for influencing the uses of private lands. Each easement can have unique features, but in general, they are crafted to ensure that natural environments are protected from future development. The owner retains the rights to sell the land and use it within the confines of the agreement, and the easement is held by a government agency or a nongovernmental organization such as a land trust, defined as a nonprofit organization that, as all or part of its mission, actively works to conserve land by undertaking or assisting in land or conservation easement acquisitions, or by its stewardship of such lands or easements (Byers and Marchetti Ponte 2005). An estimated 902 State and local land trusts operate across the region



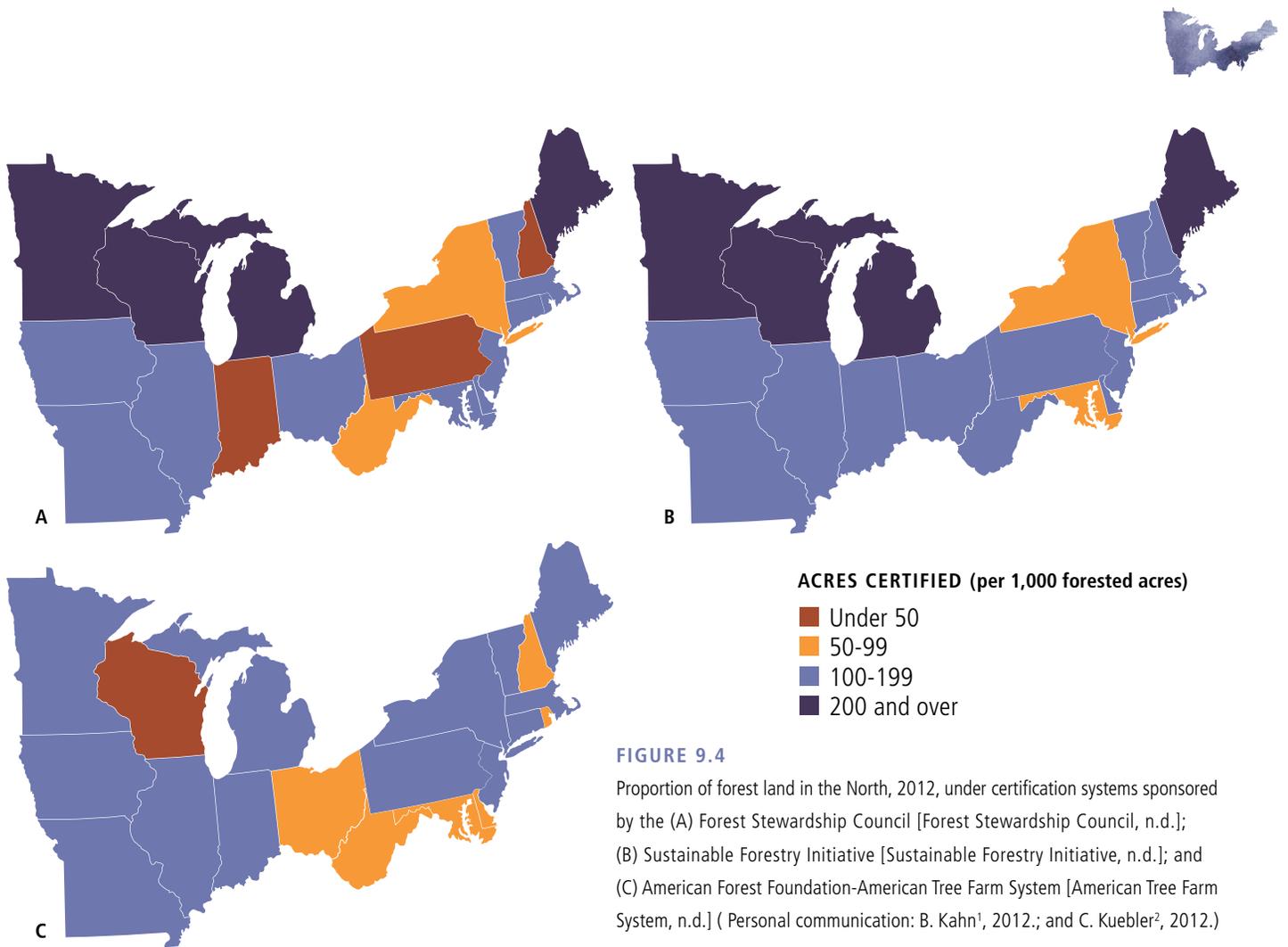


FIGURE 9.4

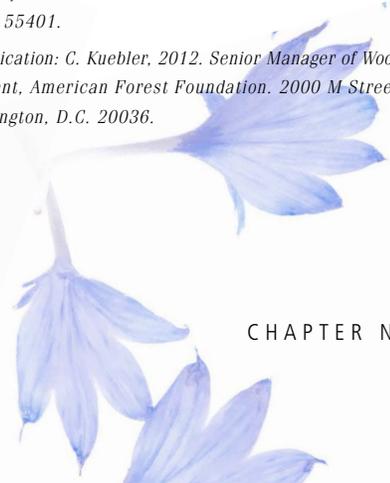
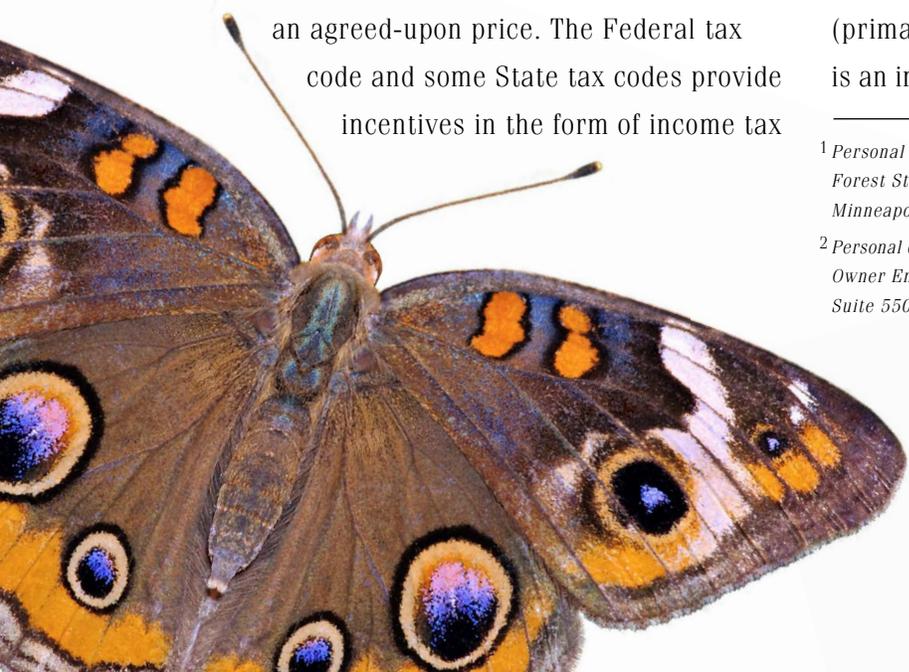
Proportion of forest land in the North, 2012, under certification systems sponsored by the (A) Forest Stewardship Council [Forest Stewardship Council, n.d.]; (B) Sustainable Forestry Initiative [Sustainable Forestry Initiative, n.d.]; and (C) American Forest Foundation-American Tree Farm System [American Tree Farm System, n.d.] (Personal communication: B. Kahn¹, 2012.; and C. Kuebler², 2012.)

(Chang 2011), each attached to a property deed and remaining effective in perpetuity, although some groups are experimenting with term easements. Owners can donate the development rights or can sell them for an agreed-upon price. The Federal tax code and some State tax codes provide incentives in the form of income tax

deductions for donating conservation easements (Butler et al. 2012). Currently, thousands of conservation easements across the region cover an estimated 7.2 million acres (1.7 percent of the total area) of forests and nonforested (primarily agricultural) land (Fig. 9.5), which is an increase of 48 percent over the last decade.

¹ Personal communication: B. Kahn. 2012. Communications Director, Forest Stewardship Council U.S. 212 Third Avenue North, Suite 445, Minneapolis, MN 55401.

² Personal communication: C. Kuebler. 2012. Senior Manager of Woodland Owner Engagement, American Forest Foundation. 2000 M Street, NW, Suite 550, Washington, D.C. 20036.



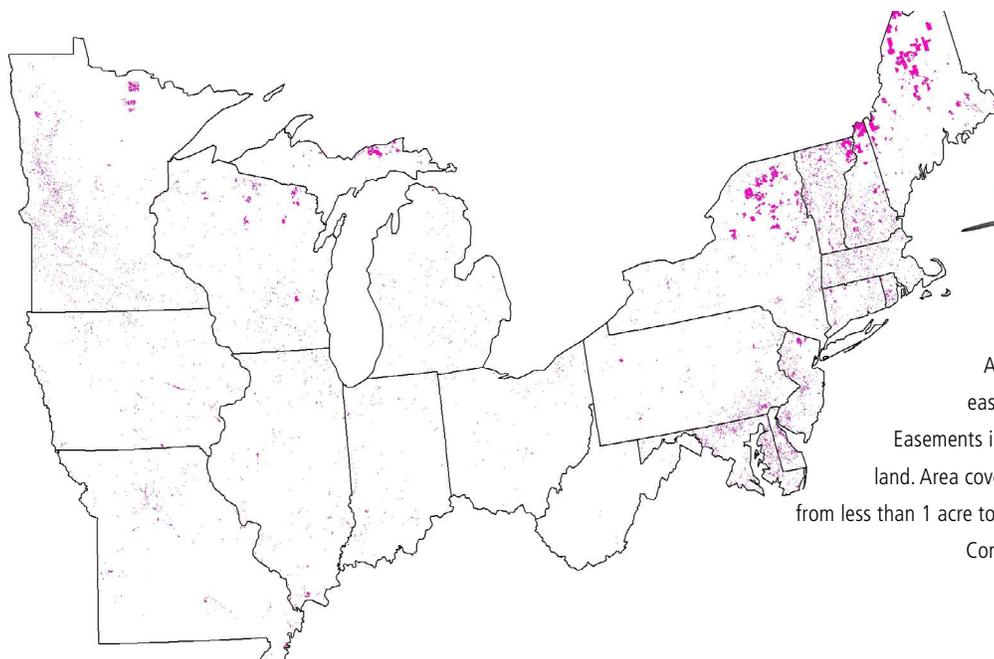


FIGURE 9.5

Approximate location of conservation easements across the U.S. North, 2012. Easements include both forests and nonforested land. Area covered by individual easements ranges from less than 1 acre to more than 100,000 acres (National Conservation Easement database, n.d.).

Through the Forest Legacy Program, the U.S. Forest Service provides funding to encourage the establishment of conservation easements (USDA FS 2013b). From 1993 (the first year of activity in the North) to 2012, a total of 458 tracts covering 1.6 million acres have been protected across the region. In addition, several state-level programs foster the establishment of conservation easements. For example, in 2008 Minnesota passed the Clean Water, Land, and Legacy amendment that added 0.375 percent to the sales tax, a third of which is dedicated to protecting, restoring, and enhancing lands and waters through conservation easements and other activities (Minnesota Legislative Coordinating Commission, n.d.).

Other government activities—Numerous laws and regulations have been enacted that hinder, intentionally or unintentionally, the implementation of forest management practices. For example, some municipalities require permits that some foresters and loggers consider overly onerous and choose to not operate in those areas. In response, some States have passed “right to practice forestry” legislation.





Predicted Trends

BMPs are subject to periodic reviews and updates. For example, many State BMPs have recently incorporated guidelines for biomass harvesting. The technical specifications in BMP guidelines and implementation strategies are influenced by professional resource managers. However, anything more stringent than voluntary BMP implementation ultimately depends on the will of the public officials and the influence exerted by their constituents.

Private sector solutions, such as certification and conservation easements, are influencing management on an increasing number of acres and are likely to continue to do so in the future. The ultimate fate of certification depends on the demand for certified products, the requirements imposed by the various certification programs, and the willingness of landowners to participate. Few, if any, price premiums have been obtained for certified wood produced in the United States to date, but certification has provided added market access (e.g., being able to supply companies that sell certified paper, certified lumber, and other products). If price premiums emerge or market access increases, certification will likely expand as well.



The acreage under conservation easements has been increasing dramatically. Assuming private owners continue to accept easements as a viable option and that organizations continue to express interest in acquiring and holding them, the area under easements will likely increase, but at what rate is unknown. Tax policies and the availability of public and private funds to purchase easements will likely influence these rates. A lack of resources to monitor the easements is a growing problem that will be exacerbated by increased area in easements, unless more is done to address this issue.

Other policies currently being debated, such as those intended to increase carbon sequestration, could have important implications for forest management (Chapter 7). Mitigation of greenhouse gas emissions through carbon sequestration is a topic of international interest (Heath et al. 2011). Programs such as the Regional Greenhouse Gas Initiative (<http://www.rggi.org>) or the California Climate Action Registry (<http://www.climateregistry.org>) provide opportunities to quantify and sell carbon sequestered in forests. Some policies allow only carbon credits from afforestation, but others include incremental carbon sequestration from existing or modified practices. Although public trading of carbon credits in the United States ceased with the shuttering of the Chicago Climate Exchange (Gronewold 2011), voluntary over-the-counter trading still occurs as private corporations hedge future policies and “green” their portfolios.

CROSS-SECTOR POLICY AND PROGRAM COORDINATION

Agricultural policies have strong links with forest policies. For example, many agricultural policies affect agricultural commodity prices, and those in turn affect the propensity of farm owners to convert forest land to agricultural land (Alig et al. 2010). The agencies that deal with forestry and agriculture are often administratively separated, thus decreasing the potential for cross-communication and increasing the potential for competition for limited resources. Likewise, many individuals and corporations working in the agriculture community operate separately from those who work in the forestry community.

Some national cost-share programs such as the Conservation Reserve Program (CRP), which supported the planting, mostly in Southern States, of 2.8 million acres of trees in the 1980s (Moulton and Hernandez 2000), are aimed explicitly at converting unproductive or erosion-prone agricultural lands to forests. Federal landowner assistance programs have gradually merged through legislation commonly known as the Farm Bill³, the most recent being formally titled the Agriculture Reform, Food, and Jobs Act of 2012. For example, the Environmental Quality Incentives Program (EQIP), overseen

³ *The Agricultural Act of 2014 (H.R. 2642; Pub. L. 113-79, also known as the 2014 Farm Bill).*

by the USDA Natural Resource Conservation Service, now contains more explicit instructions for inclusion of forestry activities in cost-share assistance (USDA NRCS, n.d.). Many state-level initiatives either operate on funding from or otherwise mirror those established at the Federal level.

The current trend within governments is for increased cross-sector cooperation. Recently, the America's Great Outdoors initiative was launched to unite all areas of conservation and strengthen public engagement with natural resources (Council on Environmental Quality, n.d.), but neither this initiative, nor few, if any, government initiatives aimed at cross-sector communication, has been fully implemented.

TAXATION AND OTHER ECONOMIC STRATEGIES

Policy tools that influence forest owners include technical assistance, educational programs, financial incentives, regulations, and delivery of tools and publications (Jacobson et al. 2009). Taxation is considered one of the most effective of these tools. Property tax policies, in particular, have a high potential to influence the behavior of family forest owners (Butler et al. 2012). This is partially due to the fact that property taxes are due regardless of how much, if any, revenue is earned from a piece of land, and revenues from forest land are few and sporadic for most family forest owners.



Current Status

All Northern States have programs that can help defer or reduce annual property taxes for landowners with forest holdings, with estimated enrollment rates ranging from <25 percent to >75 percent of eligible owners (Butler et al. 2012). Higher enrollment rates are likely a function of higher tax savings, lower barriers to enrollment, better alignment with owners' objectives, and better dissemination of information about the programs. Conversely, further expansion of programs is inhibited by enrollment barriers (such as minimum acreage requirements) and other requirements, and the "fog of low awareness, confusion, and misinformation that enshrouds tax policies" that render the programs either nonapplicable, unpalatable, or unknown to many family forest owners (Butler et al. 2012). In addition, legislation can change program requirements, benefits, and penalties, causing further confusion for landowners and administrators.

For owners whose primary ownership objective is financial gain—not the objective of most family forest owners but a paramount objective for most businesses—taxes can have an important impact. The treatment of profits is one factor that has created dramatic changes in the forest products industry. Historically, many large companies owned both forest land and the mills that processed timber from that land (hence the term, vertically integrated companies). Beginning in the late 1980s, many companies sold their forest holdings or

converted their businesses into real estate investment trusts (REITs). Many of these lands were acquired by timber investment management organizations (TIMOS; often managed on behalf of pension funds or other institutional investors) or other REITs. The advantage for such groups is that the tax burden on earnings falls to its investors rather than the investment group itself. This, combined with new ways of assigning financial value to timber assets, increased globalization, increased corporate consolidations; thus changing business strategies has created an enormous shift away from industry-owned forest land (Butler and Wear 2013).

At a broader level, government policies that affect trade with other countries can have large impacts on U.S. timber markets and consequently on U.S. forests. The Softwood Lumber Agreement of 1996 is one such example (Zhang 2001). In this ruling, the World Trade Organization determined that Canadian timber production had an unfair competitive advantage over U.S. production, and therefore imposed trade restructuring and substantial fines.

Predicted Trends

Changes to tax policies are a perennial topic for legislators, but the changes that ultimately get enacted and the consequences of those changes are notoriously difficult to predict. Future policies depend on the goals of the elected officials and the pressure placed on them by the public and special interest groups.

RESOURCE TENURE AND PROPERTY RIGHTS

There are different ways of explaining land ownership in the United States, but one useful way to view it is as a bundle of rights (Fig. 9.6), with the degree of landowner control over a specific right varying by the resource being considered (Banner 2011). For example, private owners have the right to sell their land and the right of usage according to the general laws and any easements or specific property restrictions in effect; however, wildlife, whether found on private land or on land managed by any level of government, is

Marcellus Shale rig and gas well operation in Butler County, PA.; Photo by WGN24/7 via flickr.com



Gas Drilling in the Marcellus Shale

Across much of the Alleghany Plateau of Pennsylvania and nearby States—Kentucky, Ohio, and West Virginia—extraction of natural gas from shale by hydraulic fracturing, also known as “fracking,” has become a topic of much debate. For many years, two basic methods were available for extracting gas: (1) the traditional method involves the drilling of a vertical shaft; and (2) in some types of rock formations, liquid under high pressure is sent down the shaft to “fracture” the rock and release additional gas—this is a technology that has been in use for a long time.

Recently a new method, hydraulic fracturing, was introduced whereby a well is drilled first vertically, after which the drill makes a

considered State property, and the extraction rights for belowground mineral rights are often not included with land ownership.

Current Status

In general, land ownership rights are well established across the United States and are well supported by legal precedent. Among the handful of contentious topics is eminent domain,

90-degree turn and continues, sometimes for a mile or more. Gas developers then fracture along the horizontal pipes.

Hydraulic fracturing can yield large quantities of natural gas but has also raised concerns about water quality (Soeder and Kappel 2009) and the impacts on forests (Drohan et al. 2012). The shale formations being drilled across the Alleghany Plateau and other areas across the North often underlie private forest land, but the ownership of this subterranean resource is separate from aboveground resources. The policies that govern this type of extraction are being debated and will have important consequences for the forests and the people of the region.



the capacity of a government to take land (with some monetary compensation provided) if the land is deemed necessary to build a highway or satisfy some other public good.

The longest enduring land ownership conflicts in the United States are related to Native Americans (Banner 2011), who used large swathes of land before European settlement but did not have a land ownership system that mirrored that of the European colonists. Either voluntarily or involuntarily, tribes left their ancestral grounds and many were relocated to distant reservations. Many of their descendants have subsequently fought to regain access to ancestral lands, a fight that continues.

Predicted Trends

Land tenure is fairly secure in the United States and will likely remain so for the foreseeable future. Issues related to Native American land claims are the major exception. The rights to subsurface gas, oil, and minerals are well established, but issues related to access and environmental impacts of extraction will continue to be debated.



FIGURE 9.6

Land ownership rights conceptualized as a bundle with different owners possibly controlling different rights for the same parcel of land (King County, n.d.).

ENFORCEMENT OF LAWS RELATED TO FORESTS

Numerous laws are in place to prevent illegal activities, such as timber theft, trespassing, illegal dumping, arson, and poaching, in forests, but enforcement is often difficult. Units within Federal and State governments are specifically tasked with enforcing forest, fish, and game laws and ensuring public safety. Most efforts focus on public lands, with enforcement of laws on private lands often falling to local law enforcement officials. Enforcement is complicated by the vast area that forests cover and the relative difficulty of either identifying individuals who break the law

or obtaining sufficient evidence for a successful prosecution. Existing laws cover a wide range of forest related problems, but enforcement can be difficult, primarily because of the vast areas that enforcement officers oversee. New technologies may help to reduce the cost of some enforcement.

RESOURCES TO SUPPORT SUSTAINABLE FOREST MANAGEMENT

Current Status

To augment the private foresters, wildlife biologists, and other natural resource professionals, numerous public and nonprofit organizations and programs have been established in pursuit of sustainable forest management. Both publicly funded and private-sector resources are available to help forest owners and managers meet their needs and the needs of society. Public agencies offer technical assistance and financial incentives, enforce regulations, and deliver tools, training, and publications (Jacobson et al. 2009). Service foresters in many Northern States engage in one-on-one visits with private forest owners, help owners write management plans, and provide other management advice. Extension foresters implement programs to help owners, natural-resource professionals, and community leaders through workshops, master owner programs (akin to master gardener programs), and similar mechanisms. Cost sharing of management practices, such as developing

management plans, planting trees, or improving timber stands, is periodically available through Federal and State programs.

The Forest Stewardship Program (Chapter 6) is an important source of U.S. Forest Service funding for many of these activities, particularly those implemented by State agencies. Although the funds can be used for various forms of landowner assistance, the cost sharing or full subsidization of forest management plans is a key component in many States. By 2011, stewardship plans were in place for 9 percent of northern nonindustrial private forest land (land not held by forest products companies), with individual State participation varying from <2 percent to nearly 30 percent of eligible forest lands (Fig. 9.7). The 2008 reauthorization of the Forest Stewardship Program required States to create forest action plans (www.forestactionplans.org) to be eligible for funding. These plans help States identify specific threats to their forests and develop mitigation strategies, including identification of priority forest landscapes.

In addition to public agencies, some nongovernmental organizations assist landowners with forest management. For example, forest certification, described on page 250, is a tool that helps identify, apply, and document sustainable forest management practices.



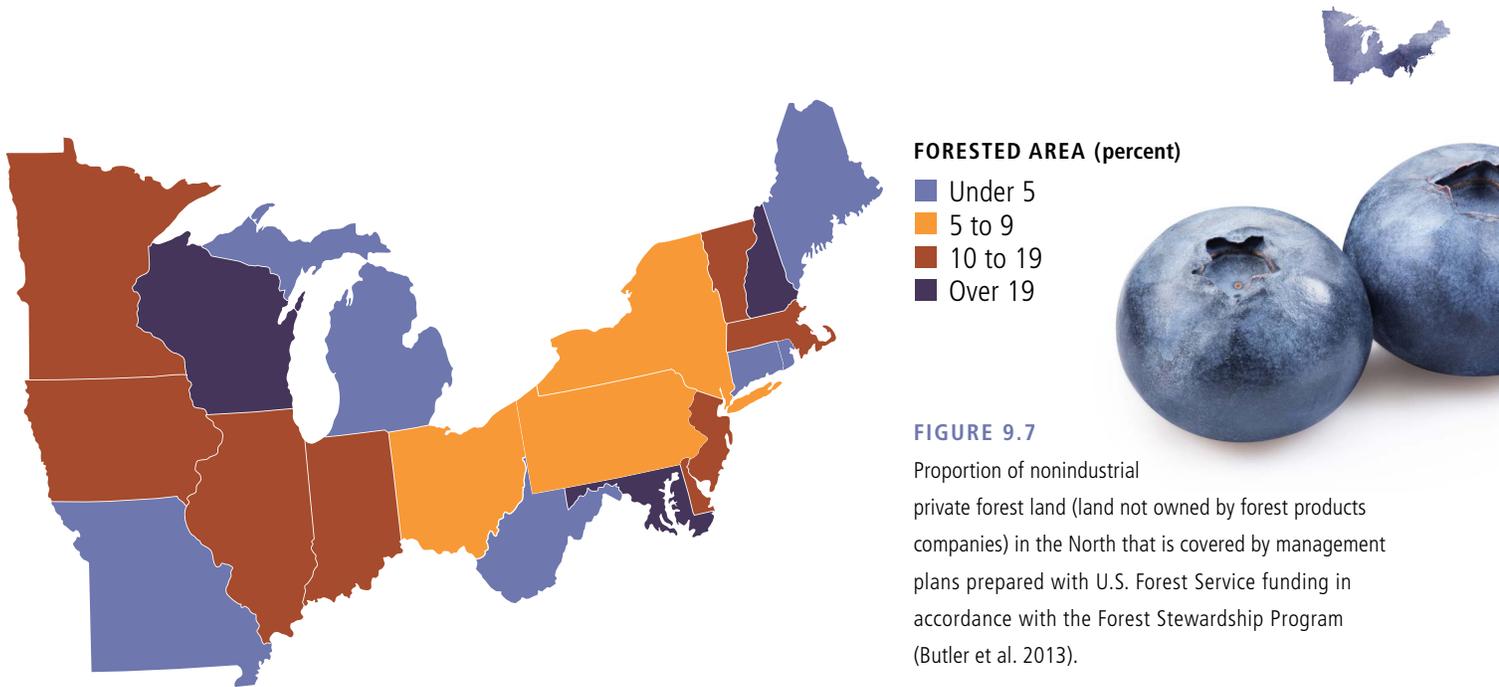
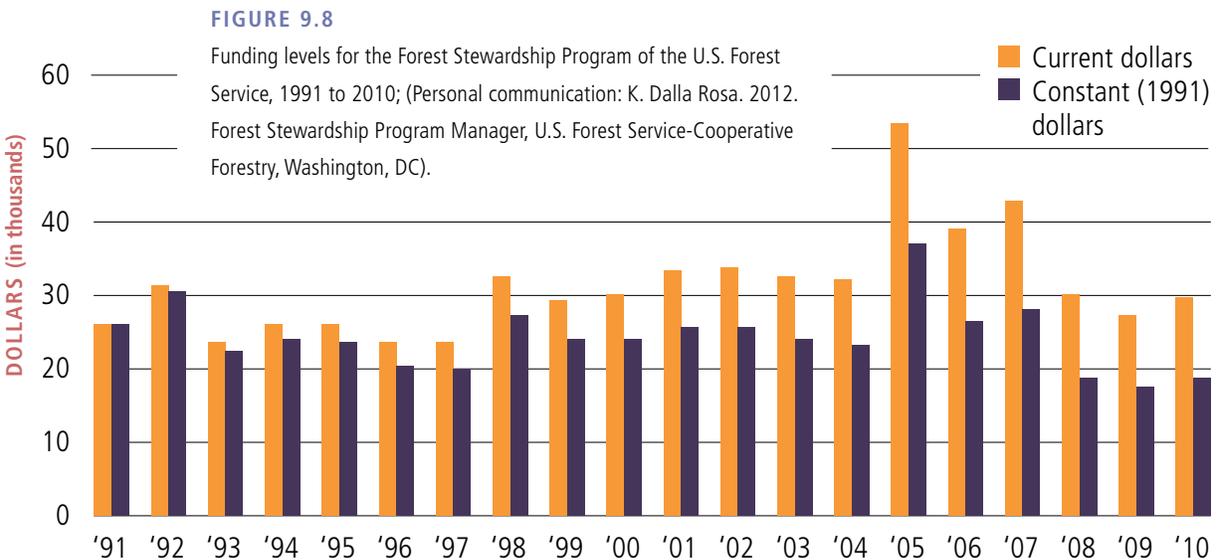


FIGURE 9.7
Proportion of nonindustrial private forest land (land not owned by forest products companies) in the North that is covered by management plans prepared with U.S. Forest Service funding in accordance with the Forest Stewardship Program (Butler et al. 2013).

Predicted Trends

Funding levels for many public programs have been decreasing. For example, the Forest Stewardship Program, which supports many State agency activities including the writing of forest management plans, decreased 50 percent from 2005 to 2010 in terms of inflation-adjusted funding (Fig. 9.8).

Forestry assistance programs will continue to evolve to meet changing needs and the realities of budget changes. Some programs now take a more prioritized approach to place limited resources in those areas deemed to provide the greatest returns. Others are shifting the delivery of services to private providers and seeking alternatives to traditional one-on-one interactions.



RESEARCH AND TECHNOLOGIES FOR SUSTAINABLE FOREST MANAGEMENT

Research organizations throughout the North conduct studies and develop new technologies to improve sustainable management of forests throughout the region and beyond. The U.S. Forest Service, which employs the largest cadre of forest researchers in the world, has a strong presence across the region (USDA FS 2013a.) Scientists at land grant universities and other universities and colleges conduct research and train future generations of natural resource managers and scientists. Many nongovernmental organizations also employ experts to address specific natural resource issues. Traditionally, forest products companies had substantial research staffs, but with the forest land divestitures to timber management investment organizations and real estate investment trusts, many of those companies have lost their research capacities, and many of the new groups have opted to discontinue research on forest resources. Nevertheless some cooperative research programs that fund and direct private landowners and nongovernmental organizations remain intact and effective (e.g., University of Maine Cooperative Forestry Research Unit 2015).

The collective forest research budget across the region has been substantial; the average U.S. Forest Service annual research appropriation for the region has been \$60 million over the

past 6 years (Chapter 8). Anticipated near-term reductions in the Federal appropriations would likely diminish research capacity. Long-term, forest research funding levels in the region are unknown but would likely mirror national trends.

PARTNERSHIPS TO SUPPORT SUSTAINABLE FOREST MANAGEMENT

Current Status

Partnerships play a pivotal role in shaping and implementing the legal, institutional, and policy frameworks for sustainable forest management. Partnerships at the national level among Federal agencies and nongovernmental organizations help advance the collective forest policy agenda. Analogous partnerships at more local levels often form around specific topics or geographic locations. Some partnerships are temporary by design or circumstance, but others have proven to be long lasting.

Through partnerships, such as the Forests in the Farm Bill Coalition⁴, the interests of forest owners and the forestry community are voiced. Many forestry programs are administered through collaborations among multiple groups that often include Federal and State agencies, universities, and nongovernmental organizations. For example, the Forest Stewardship Program involves funding from the Federal government that goes to State governments that in turn often contract with private consultants.

⁴ For a list of member organizations and more information on the Forests in the Farm Bill Coalition, see http://www.americanforests.org/wp-content/uploads/2012/01/fifb_coalition_web_version.pdf.



Similarly, the North American Bird Conservation Initiative (www.nabci-us.org) brings together numerous agencies and nongovernmental organizations to identify regional activities needed to sustain diverse, viable bird populations.

Predicted Trends

As natural resource issues become more complex and oriented toward landscape-scale solutions, coordination among owners and cooperation across agencies will be increasingly important (Harper et al. 2006). A broad view of sustainable forests, as embodied in the criteria used to organize this report, requires increased

reliance on effective partnerships to coalesce multiple interests as well as multiple fields of expertise to address the large-scale, long-term issues that affect forest conservation and sustainability. Because of increasingly scarce resources and other challenges mentioned throughout this chapter, cooperation among partners is more imperative than ever and is not expected to abate in the future.



The Wisconsin Driftless Network

The Wisconsin Driftless Network is an example of a group of partners coming together to address a common goal—increasing the engagement of family forest owners in forest conservation (<http://mywisconsinwoods.org>). The geographic focus of the partnership is an area of southwestern Wisconsin that is topographically and geologically distinct because it escaped the most recent episode of glaciation that smoothed the surrounding landscape. The partnership includes the Aldo Leopold Foundation, the American Forest Foundation, the Wisconsin Department of Natural Resources, the

University of Wisconsin, the U.S. Forest Service, and others. Its approach is to develop collaborative, innovative, science-based methods that will increase the number of family forest owners who heed its conservation message and opt to participate in conservation activities. The breadth and diversity of its membership allow for coordinated outreach efforts, sharing of costs, and sharing of combined intellect. Plans are underway to document their experiences so that others can learn from what they have done.

PUBLIC PARTICIPATION AND CONFLICT RESOLUTION IN DECISIONMAKING

Current Status

The degree to which the public participates in forest-related decisionmaking depends on the policies being considered and on the ownership of land that will be affected. For most public lands, the public has many opportunities to offer input. For example, during national forest management planning, the public is encouraged to provide input, both on strategic issues and on proposed specific management activities. Day-to-day, on-the-ground decisions are typically the domain of natural resource professionals and only occasionally capture the interest of neighbors and visitors.

Some large, private forest ownerships, either by choice or by necessity (as when required by enrollment in a certification program), also interact with the general public, primarily local residents, on forest management issues. Formal public input for smaller scale private forest ownerships is uncommon, but neighbors often informally influence each other's management decisions.



Predicted Trends

The past several decades have been marked by efforts to make the decision processes of agencies more transparent and to increase public input into these processes. If this trend continues, options for public participation in forest management decisions on public lands are likely to increase. New technologies have improved communications with stakeholders. Increasingly, proposed forest plans are distributed electronically rather than as (often massive) printed documents. Maps, which are usually an integral component of forest plans, are now shared online with applications that allow readers to interactively adjust the map scale and to select and combine map layers.

On private lands, concern for ownership rights will continue to make public involvement optional. But as forest certification systems expand to encompass more acres of privately owned forest lands, increased public involvement appears likely on those lands. Right-to-practice forestry laws have been enacted across many areas to (1) recognize the benefits of forestry to the economy and ecology of the State, (2) provide protection from nuisance complaints against landowners conducting forestry operations, and (3) limit the power of local governments to enact ordinances and zoning regulations restrictive to forestry (Granskog et al. 2002). However in many places, local laws, norms, or attitudes make traditional forestry practices difficult to implement.





PROGRESS TOWARD SUSTAINABLE FOREST MANAGEMENT

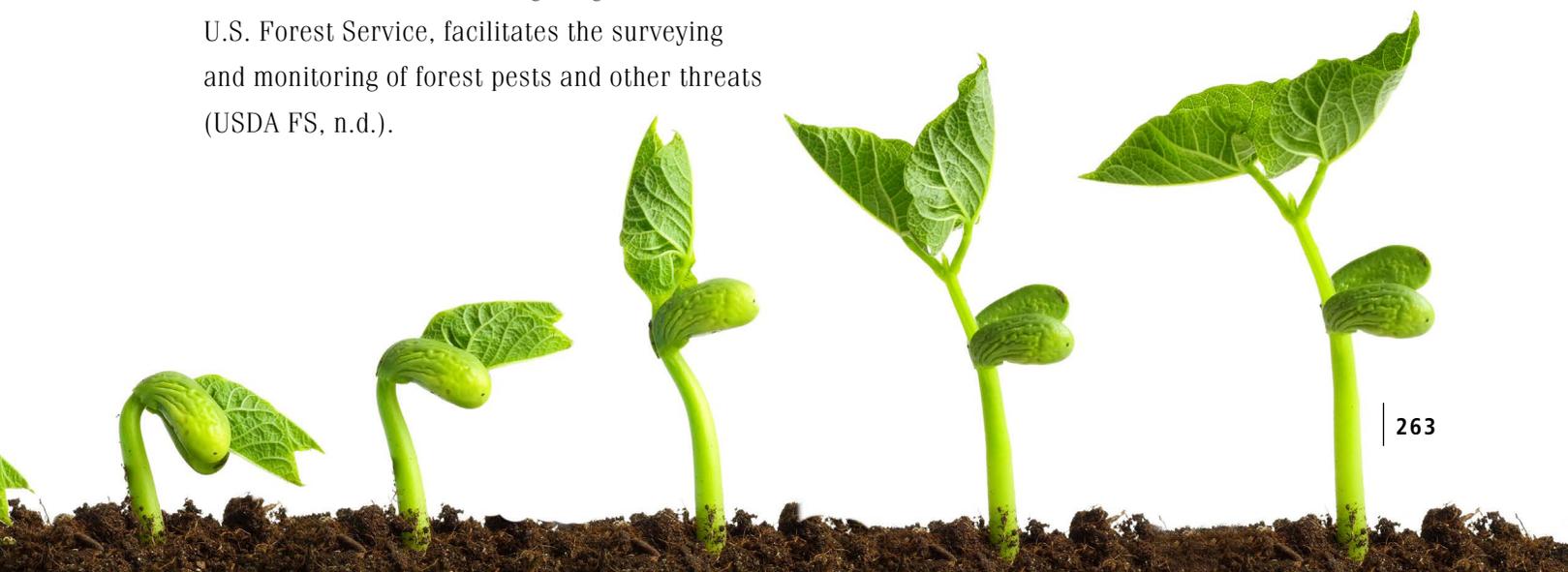
Current Status

Monitoring, assessment, and reporting of progress occur at multiple scales. Nationally, regionally, and at individual State levels, the Forest Inventory and Analysis program (FIA) provides information on trends in forest resources that is valuable for strategic planning (Bechtold and Patterson 2005). FIA inventories, which have been conducted on a periodic basis since the 1930s, now provide annual updates for all Northern States. FIA data are readily available online as are tools that allow users to summarize the data for their individual situations (USDA FS 2014b). These data are reported in national and regional reports (Smith et al. 2009) and numerous FIA-produced State reports. They are also combined with other data in State forest action plans compiled by the National Association of State Foresters (<http://www.forestationplans.org>); these plans provide snapshot assessments of forest resources, help identify key issues, and assist in setting forest policies and implementing management actions. Another important national monitoring effort, the Forest Health Monitoring Program of the U.S. Forest Service, facilitates the surveying and monitoring of forest pests and other threats (USDA FS, n.d.).

At a finer scale, most natural resource agencies and many large, private ownerships conduct their own monitoring, which provides information, often at the stand level, that is useful for writing specific treatment prescriptions. At present, these data cannot be easily combined nor summed to draw conclusions beyond the boundaries of the lands on which the inventories are conducted because of differences in data collection protocols and issues related to data sharing.

Predicted Trends

The fate of public inventory and analysis programs depends on funding levels and the desire of governments and the public for this information. At the national level, forest inventory and forest health monitoring have had strong support, but funding has been flat in recent years; from 2007 to 2011, the FIA budget decreased by 0.5 percent in terms of inflation-adjusted dollars (USDA FS 2014a). Among individual States, support for inventory and monitoring varies significantly. Nevertheless, unless resource decisionmaking ceases to be data driven, the need for inventory data will continue.





New and emerging technologies will continue to influence the collection, analysis, and dissemination of inventory data. Remotely sensed data are now routinely combined with field inventories to decrease the cost and increase the utility and precision of inventory and monitoring products. Online tools, such as FIA's Forest Inventory Data Online tool (USDA FS 2014b) and EVALIDator tool (Miles 2014) have increased data access and utility.

Over the past few decades, the objectives of the inventories have shifted dramatically. Initially they were focused on estimating timber volume by species and location. However, in recognition of the vast array of goods and services that forests provide—ranging from the intrinsic value of biodiversity to the role that forests play in water recharge and purification—the scope of inventoried forest characteristics has expanded and will likely continue to do so.

CONCLUSIONS

The role of the legal, institutional, and policy framework in sustainable management of the forests of the Northern United States has been important in the past and is likely to become more so in the future. Ultimately the will of the people, as expressed through politicians, nongovernmental organizations, and markets, will determine the reach of those laws, policies, and institutions. As forest policy shifts (Schelhas 2003), understanding the complex, multifaceted issues and interactions affecting the region's forests has become more important. The availability of resources will continue to be a major issue that influences all aspects of the legal, institutional, and policy framework.





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