America's Private Forests
Status and Stewardship

Constance Bert
Laurie A. Wayburn

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This section provides background and context for our recommendations for an action plan to promote the conservation of private forests in the United States. We will examine the changing nature of private forests and private forest ownership at the end of the twentieth century as a basis for understanding the major threats to the maintenance of this large and important resource as fully functioning forests in the twenty-first century.

Forests occupy an estimated 747 million acres, or one-third of the nation's land area, and 58% or 430 million acres are privately owned. The private forests of the United States account for 30% of the world's total. U.S. forest types and forest ownership are many and varied, forming a complex whole. While much attention (and no small amount of controversy) is directed at the management of federal forests and the operations of the forest products industry, both hold relatively modest portions of the nation's total forests (figure 1). Almost half of America's forests are held by some 9.3 million nonindustrial private owners. Any serious forest conservation effort must therefore consider what is happening on these lands and why.

We will look carefully at the people and businesses involved in forest ownership. Today humans are the most significant force in ecosystems, shaping the forest as surely as fire does. It is humanity's collective sense of values that has guided our interactions with forests through history. And those values change. What was once seen as "good" (carving a field out of the wilderness for a family's home) may now be seen as "bad" (cutting the last old growth, er fragmenting a forest habitat). The values, needs, and goals of forest landowners must be central to our understanding of the opportunities and strategies for conservation.

We also look at the land itself, and the character of the forest ecosystems involved. These are not the same forests encountered by explorers and pioneers, nor are they even the same as those of a half century ago. In many places, they are forests that, in an ecological sense, contain an entirely different set of species, structures, and processes than may ever

1. The forest statistics in this report are taken either from USDA Forest Service data for 1992 (Powell et al.) or from the recently released 1997 RPA.
2. We use the terms forest and forest ecosystems interchangeably, since we view a forest as a discrete piece of the landscape, complete with all living and nonliving components, affected by all energy and material flows into and out of it. For literary convenience, we avoid the longer term except when context seems to demand its use.
have existed before. Where that is the case, scientists may have few guides as to how these forests will continue to change and adapt in the future. Will this combination of human and natural changes result in a sustainable forest—sustainable in the sense that the forest will continue to maintain its ecological processes and functions—or will they result in an entirely different ecosystem, perhaps one that is desert, or even desert? While deserts have their own intrinsic values, they are not the same values forests have, and the difference is significant to many people. Further, if that difference was created, or exacerbated, by human actions, people are responsible for what has occurred. Thus our focus is on the forest and its capacity. Can it sustain its ecological integrity under the pressures of current human activity, or is its future imperiled? Can we identify the root causes of the potential threat and affect them in a more positive way?
in this context means a company that owns both forestland and mills to process forest products. Thus, industrial forestland may be held in million-acre tracts by a multinational corporation, or it may be a 160-acre parcel owned by a small local sawmill. A large oil company or institutional pension fund that owns forestland but does not own a wood-processing facility will be found in the nonindustrial category. The nonindustrial category encompasses land that may be held by an individual with 5 acres as well as hundreds of thousands of acres held by Alaska Native corporations. In some cases it is possible to tease some of these differences out of the data sets, but often the distinctions are difficult or impossible to determine.

Table 3-1, which describes ownership types compiled from the 1994 Birch study, provides some illumination on the kinds of entities that own forestland. Looking at this table, we can begin to appreciate the diversity of nonindustrial owners. While individuals and families are the largest ownership types overall, the forest industry clearly has the most concentrated control. It may be most useful to consider forest landowners by distinctions of mill-ownership, but rather by size. Large, medium, and small ownerships, whether with or without mills, tend to share common attributes within their size categories. Therefore, we will utilize the following categories for analysis of the characteristics of private forest landowners:
Residential Forest Owners: 1-9 Acres

This size ownership tends to be fragmented in nature. The distribution of these properties is typically much smaller than other size categories. Many of these properties are converted to residential use and are no longer managed as forestland. As a result, these properties are often not included in forest management plans or considered part of the forested landscape.

Small Forest Owners: 10-99 Acres

This size ownership represents a significant portion of the total forestland. These properties are more likely to be managed for forest products, such as timber, and may be part of a larger forest complex. They are often located in areas that are more accessible and easier to manage, making them more likely to be considered for forest management planning.

Medium Forest Owners: 100-999 Acres

These properties are typically more densely forested and are managed primarily for forest products. They may also be used for recreation or other non-forestry activities. These properties are an important source of wood products and are often considered part of the forested landscape.

Large Forest Owners: 1000+ Acres

At this threshold, forest ownership becomes less significant for forest management decisions. These properties are often managed for forest products, but their size and remoteness make them less likely to be considered for forest management planning. They may be part of larger forest complexes or isolated landscapes.

Forest ownerships as percent of total by size (including size categories > 9 acres)

![Graph showing forest ownerships as percent of total by size](image-url)

Poorest forest ownership as percent of total private forest acreage

![Graph showing poorest forest ownership as percent of total private forest acreage](image-url)
If the residential owners' share of total private forest ownership is excluded, the ownership picture changes to better reflect the realities of forest management and conservation. With an estimated forestland base of 376,700,000 acres having 4.1 million owners, the average parcel is 92 acres (versus 40 acres if the residential owners are included). Small landowners comprise 84% of owners and control 29% of the forest. Medium landowners comprise 15% of the total with 31% of the acres. The large landowners still number less than 1% while accounting for 40% of private forest (figures 1-1 and 1-2).

**Why People or Businesses Own Forestland**

The following charts based on the Birch 1994 data (figures 1-3 and 1-4) give us some indicators of the reasons different entities own forests. (Because of the way the Birch data is published, these and other data presented in this section include the 5.8 million residential forest owners, thereby providing some bias toward this group.) While the data are not crystal clear, they suggest that U.S. private forests are owned roughly equally by those with primarily "productive" or economic motives and those who own forests for "nonproductive" personal, cultural, and/or ecological values.

Almost 40% of owners, by far the largest block, state that their primary reason for owning forestland is simply that it is a part of their residence or farm. Another 23% characterize their primary reason as being for recreation or for the sheer enjoyment of owning forestland.

Just 20% of forest owners state that their primary reason for ownership is economic. These owners have forests either for timber (about 30%), real estate investment, or as a productive part of a farm or home, yielding timber, fence posts, or firewood. However, as figure 1-4 illustrates, this group of owners controls almost half of U.S. private forests, with timber production alone representing 30%.

Still, substantial forest acreage, often in the smaller ownership size classes, is held for its noncommercial values. In fact, included in the 16% of "other" uses is cultural use by Native Americans. (Other uses also include mineral extraction, for owners of mineral rights, the trees are incidental to other economic use.) Various surveys of forest landowners indicate that smaller landowners rank enjoyment of forest ownership highest compared with larger landowners. Although it is very difficult to generalize, it appears that as tract size and value and frequency of timber
Table 1-4.
Ownership expectations of future timber harvest

<table>
<thead>
<tr>
<th>Expected Future Harvest</th>
<th>Percent of Owners</th>
<th>Percent of Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10 years</td>
<td>31.6</td>
<td>63.1</td>
</tr>
<tr>
<td>Indefinite</td>
<td>27.7</td>
<td>23.1</td>
</tr>
<tr>
<td>Never</td>
<td>34.9</td>
<td>11.5</td>
</tr>
<tr>
<td>No answer</td>
<td>5.8</td>
<td>2.5</td>
</tr>
</tbody>
</table>

revenue increase, timber production becomes a primary reason for ownership. Nonetheless, most of these owners also have multiple goals, combining timber production and other values.

Some interesting variations show up when the primary reasons for ownership are compared with owners' statements of the benefits they desire to derive from that ownership in the next ten years. Questioned in this way, more owners indicate their intent to gain income from timber harvest, increasing the acreage oriented to timber production from 29% to 33%. Strikingly, while only 9% of owners state that land investment is their primary reason for owning forestland, 20% expect to reap the benefit of increased land value in the next decade. This 20% appears to be weighted heavily toward smaller landowners. All in all, many owners are expecting greater productive uses of their forests in the coming period, increasing to 45% of ownerships and 63% of forest acreage.

It is also worth noting that expected enjoyment of forest ownership markedly increased as a primary reason for ownership, from 14% of owners to 34% and from 7% of acreage to 16%. This increase is probably attributable to the responses of many whose primary reason for owning land in the first place was incidental to ownership of a residence or farm.

1. In a study of 1,300 Virginia private forest landowners, researchers found that both harvesters and nonharvesters rated preservation of nature, scenic values, and wildlife as their top reasons for owning forestland (Hodge and Souther 1992). Similarly, a 1994 survey of primarily larger NIPFs in Indiana, Utah, and the Southeast found that the highest-rated reasons for forest ownership were preservation of wildlife habitat, maintenance of natural beauty, personal recreation, and simple satisfaction of ownership (Irvinson et al. 1996).

Figure 1-5.
Percentage of ownerships and acreages with intent to harvest within next 10 years by size class

Timber Harvest Activities of Various Landowners
Looking at these data should be reassuring to those concerned about future timber supplies, as the vast majority of owners indicate their willingness to cut timber at some point. According to Birch (1996), 46% of forest owners, who own 78% of all forests, had previously harvested timber on their land. Table 1-4 shows that almost 60% of owners, with 86% of forest acreage, intend to harvest in the future. At the time of Birch's survey, only 11% of private forests were owned by people with no intent to ever harvest.

Figure 1-5 shows ownership organized by size class for both number of owners and acres in each class. We will consider timber harvesting further when we focus on the behavior and attitudes of individual nonindustrial owners in the next section.

In general, the harvest behavior of industrial and nonindustrial landowners is different. Industrial forests are owned primarily for fiber output to supply processing facilities; therefore fiber output is maximized to the degree possible. Nonindustrial forests are held for a wide variety of reasons. Ownership surveys find that in general NIPFs are not opposed to timber.
harvest. In the South, for instance, historical rates of harvest for industry and NIPF owners are comparable (Alig et al. 1990b). However, current research indicates that NIPFs value their standing timber more than industrial owners. This seems to be due to the value NIPF owners put on non-timber forest resources, "receiving non-markets (non measured) benefits from holding timber in place" (Neuman and Wear 1993). In other words, while NIPF owners will harvest timber, they also highly value the amenities provided by the forest itself.

**Degree of Forest Management Planning by Landowners**

The USDA Forest Service estimates that in 1993 5% of owners had written management plans for their forests. These owners—most likely from the same group that gave timber production as a primary reason for and benefits of forestland ownership—hold 39% of private forests. Forty-three percent of them are industrial owners and 57% nonindustrial. Most forest management plans focus on timber harvest. It is not known to what degree ecological resources are included. Given that so many NIPF owners have multiple goals for their forests, with timber harvest included but not primary, there are great opportunities to expand owner engagement in forest management planning if a greater emphasis is placed on overall forest stewardship than on commercial timber harvest.

**Length of Forest Ownership**

Greater ownership turnover tends to lead to reductions in parcel size and increased fragmentation of forestland. Forests are turning over faster than it takes for them to mature. As each new owner takes title, new goals for the land are set. Inconsistent forest management and overharvesting over time can be the result. The dates forest owners of all types acquired their forestland show that more than 40% of owners acquired forestland for the first time since 1978. These recent acquisitions involved 23% of private forest acreage (Birch 1996; figures 1-6 and 1-7). Only 30% of forest acreage has been held forty-five years or more, in less than 10% of ownerships. We will look at some of the trends apparent in recent turnover at the end of this section.

2. Some 11% of private forest or 44.7 million acres has been held in the same ownership since before 1900 by an estimated 66,600 owners. Eighty-eight percent of these owners are farmers or individuals; 0.3% or two hundred are from the forest industry.
America's Private Forests

When the diversity of private forest landowners and the diversity of their goals in forest ownership are considered, it becomes easier to understand the impact of changing ownerships on the forest itself. Aside from the clear trend of more ownerships and smaller parcel sizes at every size class, turnover in forest ownership has other impacts. Whether large or small, industrial or nonindustrial, the land use decisions of each owner are impinged on the forest and lasting in nature. The rate and intensity of timber harvest, road and home building, agricultural conversion, introduction of exotic species, and other activities often are compounded through time by turnover in ownership.

Focus on Nonindustrial Private Forest Owners

As of 1997, nonindustrial private owners held about 326.8 million acres of forestland, of which 290.8 million were classified as timberland. This represents 58% of all timberland. (See appendix table B-1 for state and regional details of forest-timberland ownerships by acres.) Some 72% of the nation's loblolly pine inventory and 30% of softwood are found on nonindustrial timberland. About 60% of the commercial timber stocking on NIPF land is hardwood. Statistics do not yet capture the stocks of non-commercial species or species occurring on “other forestland.”

Nonindustrial ownerships are most numerous in the East. About 42% of the NIPF forests are in the southern regions (comprising 70% of all forestland in the South) while 32% are in the North Central and Northeast regions (comprising about 67% of forestland in these states). Viewed another way, southern NIPF's own 49% of U.S. timberland; in the North Central and Northeast regions, they own about 40%. Western NIPF ownerships are 25% of total NIPF forests; controlling about 25% of forestland in these states.

Of the nontimberland held by private owners in the United States, 36% is in Alaska, largely held by Alaskan Native corporations. Another 25% is found in the Four Corners region (Arizona, Colorado, Utah, and New Mexico), largely in pinyon-juniper woodlands; 15% is in California's woodlands; and 10% occurs in Texas, largely in mesquite woodlands. For most of the remainder of the nation, NIPF forests are almost entirely classified as timberland.

As already noted, nonindustrial forestland owners are especially diverse. This discussion focuses most of its attention on the vast majority of NIPF owners, including residential forest owners who are individuals or families.

Separately below we will examine two other important NIPF owner types: institutional investors and Native Americans. In understanding individual, nonindustrial forest landowners, perhaps the most important thing to grasp is that they are essentially no different in their attitudes and sociodemographic profiles from Americans in general. There are some important distinctions, however. Generalizing the characteristics of some 9 million individual Americans who own forests obviously requires oversimplification, but the available evidence suggests the conclusions below.

America's forest owners are, like the general population, aging (figure 1-8). In 1994, 24% of the NIPF forestland was held by individuals over 65 years of age. This was up from 19% in 1978. Between 1978 and 1994 (figure 1-8) the amount of forestland owned by retirees increased from 47 million acres to 77 million.

Also, like the rest of the population forest landowners are more urban oriented (figure 1-9) than they used to be. Between 1978 and 1994, the amount of forestland owned by farmers and blue-collar workers dropped from 90 million acres to 60 million, while the amount owned by white-collar workers increased from 49 million acres to 68 million. It is likely that the increase in retirees has been drawn from rural, farming, and/or blue-collar owners as well as from new owners retiring from the city.

The average size of individual ownerships had been shrinking for years and is now, or soon will be, under 20 acres (figure 1-10).
The environmental attitudes of NIPF forest owners are distinguishable from those of the general population. In a conflict between environmental and economic interests, a majority of NIPF landowners think environmental interests should prevail (Bliss et al. 1997).

Larger forest owners and those with a greater financial stake in timber harvest oppose government regulation as a means of achieving environmental goals (Bliss et al. 1997; Johnson et al. 1997). As the attitudes of NIPF owners toward the environment and regulatory protection of nonindustrial resources are important to understand, we will discuss them further below.

Contributions of Nonindustrial Owners to Timber Harvest

These landowners as a class consistently provided 47 to 52% of the timber harvested in the United States for the forty years from 1950 to 1990 (Allig et al. 1990a). As discussed further in chapter 2, during the 1990s, the NIPF share of harvests rose to 60%, a dramatic increase from historic levels driven by reductions in supplies from federal and industrial sources. This increased share is expected to continue for at least the next fifty years. Softwood supplies.

4. In a 1993 Pennsylvania survey, forest landowners more than the general public were found to be engaged in environmentally prompted actions such as utilizing environmental criteria in their buying decisions. As one review commended, "The typical Pennsylvania landowner is apparently an environmental "active"" (Jones et al. 1997).
plies from NIPF ownerships have declined and hardwood supplies have increased. NIPF lands, which have 70% of hardwood stocks, are providing 75% of harvests. Because NIPF lands contribute such a large percentage of the nation’s timber supply, the sustainability of NIPF lands is directly linked to the sustainability of the timber supply in the United States.  

More than 80% of these harvests occurred on larger ownerships where harvests may be more regular than the episodic harvests of small ownerships. In general, NIPF owners are more likely to harvest when the current market price for timber is high or if perceived threats to tree mortality by insects, disease, or fire are increased. Since timber harvest is not a high priority for most NIPF owners, they may tend to wait out market fluctuations hoping for a higher price to ensure an economic return on their investments. Timber sales may be dominated as much by family or financial conditions (an owner’s death or a major financial need) as by a forest management plan. However, there are few hard data on the relative economic importance of timber harvests on NIPF lands to the employment and income of the owners (NRC 1998).

Interestingly, other nonforest income may be a factor in harvesting decisions. In analyses of NIPPs in the East, higher-income owners appear less likely to harvest timber than lower-income owners (Aliq et al. 1998). Higher education also appears to be negatively correlated with timber harvesting by individual forest owners (Binkley 1981, Dowd 1984). At the same time, landowners with higher income and/or higher education demonstrate a greater willingness to learn and innovate. Therefore, their interest in timber harvest tends to be tied to learning about their forest property and gaining technical assistance in forest management (Hodge, pers. comm.).

Individuals with small- to medium-sized acreages appear more likely to engage in active forest management when they understand its role in the context of their forest stewardship goals and not simply as logging for financial remuneration (Bourke and Luloff 1994). Frequently the timber harvest goals for these owners reflect their multiple goals for their property: they desire some revenue, but they also want to enhance amenity, wildlife, and recreational values. Perhaps also reflecting the precedence of environmental and amenity goals, most NIPPs—even in the South—dislike or even oppose clear-cutting (Jones et al. 1993). However, even though timber harvest is not their main purpose in owning forestland—and they may have different silvicultural preferences than industrial owners—clearly NIPF owners do not oppose harvesting per se and intend to harvest at some point.

Attitudes of NIPF Owners toward Environmental Protection and Environmental Regulation

In reviewing the literature of NIPF research, it becomes clear that owning and managing forestland does not strongly influence attitudes toward forest management and forest policies. However, NIPPs appear to be slightly more conservative than the public at large (Bourke and Luloff 1994). While NIPF support for environmental protection is generally strong, using regulation as the means to that end is not supported by those owning larger forest properties. As summarized by Bliss, NIPPs “share the public’s concerns about clearcutting and herbicide use, support regulating forest harvesting practices where necessary on private land to protect environmental values, and generally value environmental protection highly relative to both private property rights and economic development” (1997). The data suggest this is true regardless of gender, income, or residence. In Bliss’s Tennessee Valley study of NIPPs, strong majorities agreed that private property rights, while important, were secondary to environmental protection and that rights should be limited where necessary for the environment. However, as tract size increased, and with it timber orientation, property rights sentiment increased. When the sample was limited to landowners with 100 acres or more, only 27% supported regulations as a means to protect water quality, threatened species, and scenic beauty.

These findings were corroborated by Johnson et al.’s survey of nonindustrial landowners in the Pacific North-west (1997). They found that the strong majority of landowners were not influenced by the threat of future regulation in their recent harvest decisions. Yet as their financial stake in the forestland increased (larger tracts, majority of income from timber, long-term hold, mature trees), they became more concerned about the
impact of possible future regulatory restrictions on their investments. About 75% of the larger landowners (those with more than 100 acres) felt that no additional restrictions should be put on private lands to protect riparian ecosystems or endangered species. A majority indicated they would harvest sooner than planned if they felt such new regulations were imminent. Nonetheless, 50% of larger and 70% of small landowners agreed with the statement, “I would be willing to alter the amount and time of my harvest if it is necessary to maintain a healthy ecosystem.”

These insights into NIPF characteristics will be especially important as we consider the trends in forest ownership and their implications for a conservation strategy.

The Nature and Goals of Institutional Forestland Owners

Institutions such as pension funds, foundations, university endowments, and the like are a small but growing class of large, nonindustrial landowners that control an estimated 5 to 7 million of the 352.5 million acres of NIPF forests. Since the passage of the federal Employee Retirement Income Security Act (ERISA) in 1974, pension fund ownership of forestland has grown as an investment asset included for diversification within these owners’ huge portfolios. When the Hancock Natural Resource Group first organized a timber investment fund for large institutional investors in the mid-1980s, total institutional investment in forests was an estimated $300 million. It grew to an estimated $7 billion in 1999. This represents some 1% of pension fund assets and a similar percentage of the estimated total U.S. private forestland market value. CalPERS, the huge California public employee pension fund, and Ohio State Teachers Fund are among the largest of this class of owners, acting through their timber investment managers. A handful of managers represent institutions. In addition to Hancock, the major ones include UBS Brinson, Wackovia, Prudential, the Forestland Group, Forest Investment Associates, Wagner Woodlands, and the Campbell Group. Collectively, these managers are called timber investment management organizations (TIMOs).

Institutional owners have been drawn to forest ownership because of the perceived characteristics of forestland as an asset class within their portfolios. Economists have analyzed the behavior of forestland compared to other financial assets and found that it can provide relatively high risk-adjusted returns, especially with holdings that diversify commercial species and regions. Pension fund investors, by far the largest institutional forest landowners, are in a fiduciary role, representing the many beneficiaries of their institution. They generally take a longer-term view of their investments and have historically been very averse to risk. To generate the highest possible returns while mitigating risk, institutions have developed sophisticated financial models to guide their acquisition and disposition of a wide range of assets.

The most basic goal of institutional forest landowners is to deliver a desired rate of return from the sale of timber and land while minimizing risk. They do not have mills or other processing facilities to supply. Therefore, although among the largest landowners, they have relative flexibility in merchandising their timber and land. Like smaller NIPF owners, but with much greater scale and sophistication, they can choose to sell or not sell commercial tree species and different kinds of timber for particular products as they see the markets. Similarly, they will move in or out of a specific forest type, region, or, as is now happening, country to fit their financial models.

There have been no studies of these owners to better understand their actual forest management behavior or the importance of nonfinancial goals relative to financial ones in their decision making. In general, institutional owners have tended to manage forests on an industrial model, although there are exceptions. As fiduciaries, their ability to invest in activities that do not bring direct returns is limited. As managers for high-profile, quasi-public institutions—with the retirement funds of many individuals in their care—good government, community, and public relations are important for them to maintain. Therefore, institutional owners engage in forest stewardship activities to demonstrate good citizenship and mitigate risk at the same time. We will discuss the growing institutional ownership of forestland further as we consider overall trends in forest ownership below.

Focus on Industrial Private Forest Owners

About 67.6 million acres or almost 9% of U.S. forestland are owned by the timber industry, of which 99% is timberland (USDA, Forest Service 2000). This represents 13% of all timberland. (Bleich estimated almost 80 million acres in 1994 using a somewhat different definition.) Between 1952 and 1992, the forest industry acquired 11.5 million acres of private forestland from larger NIPFs (whose ownership acreage decreased by 16.8
American Paper and Pulp 2b

2b Once the Forest and HHP

input have been introduced into the pulpwood and sawlog dimension lumber markets in a number of ways. According to industry sources, input that has been introduced into the market for a number of years has been a significant portion of the total volume of wood produced. In addition, many of the larger integrated mills have begun to increase their use of wood from the forestland to meet their needs for raw materials. This increased use of forestland has been driven by a number of factors, including the increasing cost of purchased wood, the desire to reduce their dependence on outside suppliers, and the desire to improve their environmental image. The increased use of forestland has also been facilitated by the development of new technologies that make it possible to harvest and process wood more efficiently. As a result, the use of forestland for wood production is expected to continue to increase in the future. However, there are also concerns that the increased use of forestland for wood production may have negative impacts on the environment, including loss of wildlife habitat and increased carbon emissions. These concerns have led to efforts to develop more sustainable forest management practices, including the use of selective harvesting and forest restoration.
last twenty-five years, since the passage of the Endangered Species Act (ESA), Clean Water Act, and other state environmental legislation. The public has expressed its desire to sustain wood and fiber production within the context of ecological sustainability. Operating at or above the stewardship standards set by law has become paramount for industrial operations to maintain their "social license to operate." Building positive regulatory and community relations is essential to mitigating risk and maintaining consistent production in their operations. Most industrial forest companies understand that private property rights come with responsibilities.

With the historic legacy of public mistrust, industrial forest products companies are more positively engaged in activities to protect or restore habitat and water quality than ever before. A&F PA reports that in 1998 12.8 million acres of land in its SFI program were covered by nine kinds of cooperative fish and wildlife management agreements with a government agency or conservation organization. The forest products industry has a clear preference for voluntary approaches to protecting and enhancing environmental values on its lands.

Similarly, over the last eight years the forest products industry has increasingly utilized Habitat Conservation Plans (HCPs) to meet the requirements of the ESA while maintaining its forest management. According to a review of HCPs performed by FPT in October 1999, approximately thirty-one incidents of natural expansion of HCPs have been approved under Section 10 of the ESA, covering management of more than 8.5 million acres. Such is this industrial forestland, including property owned by International Paper, Potlatch, Weyerhaeuser, Simpson, Union Camp, Crown Pacific, Plum Creek, and Pacific Lumber.

Focus on Tribal Forest Owners

It has been estimated that in the continental United States, 193 Native American reservations in twenty-three states contain some 16.8 million acres of forestland. Of these, 5.7 million acres are managed for timber production, 1.7 million acres are noncommercial timberland, 4.4 million acres are commercial woodland, and 4.2 million acres are noncommercial woodland (Morishita 1997; Intertribal Timber Council 1993). Native American ownership takes the five forms shown in table 1-6.

Ownership fragmentation is a major problem on the forestland owned by individual Native Americans, often held in trust by the federal government. These lands were distributed to native individuals in small allotments (often 160 acres) under the 1887 Dawes Act. As each generation passes, and those allotments are divided among heirs as undivided property interests, administration of federal trust responsibilities becomes more of an administrative nightmare. The U.S. Department of the Inter-

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Table 1-6.
Forms of Native American forest title

<table>
<thead>
<tr>
<th>Type of Ownership</th>
<th>Acreage</th>
<th>Title Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tribal trust</td>
<td>14,000,000</td>
<td>U.S. government</td>
</tr>
<tr>
<td>Individual trust</td>
<td>648,000</td>
<td>U.S. government</td>
</tr>
<tr>
<td>Individual restricted fee title</td>
<td>868,000</td>
<td>Native American with U.S. government restrictions</td>
</tr>
<tr>
<td>Tribal restricted fee title</td>
<td>6,000</td>
<td>Tribe with U.S. government restrictions</td>
</tr>
<tr>
<td>Tribal fee simple</td>
<td>820,000</td>
<td>Tribe without restrictions</td>
</tr>
</tbody>
</table>
rior, charged with collecting fees and redistributing them to the appropriate owners, has been unable to carry out that responsibility for decades, in spite of legal action demanding that the situation be rectified. It is uncommon for these fragmented ownerships to be divided up and sold for development, as it is often the case with non-Native American forests. Such ownership fragmentation makes decision making and management increasingly difficult.

Tribal leaders have opposed the adoption of certain aspects of private property principles that are typical of non-Native American U.S. ownerships. While it is difficult to generalize across a wide diversity of native peoples, tribes typically do not want tribal members to sell land without permission of the tribal government. They also prefer that the lands held by Native Americans be held by the tribe and not by individuals. Both preferences are rooted in cultural traditions (NRC 1996).

As sovereign nations, tribal reservations govern themselves and are not subject to land use or forestry regulation by the states. They are, however, subject to relevant federal laws, either directly or through the Bureau of Indian Affairs (BIA). Given the history of European settlement and conflicts with Native Americans, tribes are very concerned with establishing and maintaining control of their land and resources. It is important to remember that treaty terms are still being litigated by tribes for enforcement of their rights. Fishing and hunting rights based on customary tribal use have been upheld in the courts and through statute in several states. There are many controversial issues on the relationship of tribes to federal and state governments, as well as to surrounding nontribal communities.

As with other forest landowners, tribes have various goals for their forests, both cultural and economic. While Native American timber makes only a modest contribution to the national totals, it is an extremely important source of revenue for the tribes, generating some $465 million and 40,000 jobs for tribal communities in 1991 (Morishima 1997). In addition, many other commercial and noncommercial uses of Native American forests and woodlands are important contributors to both cultural and subsistence needs. Fish, wildlife, medicine, native foods, and firewood are of prime importance to most Native American communities.

Forest management on Native American lands was, for many years, carried out almost entirely by the BIA, which was subject to serious and consistent underfunding from Congress. A 1993 study by independent forestry experts concluded that Native American forests were receiving 37% less funding for timber production than national forests, and only 50% of what was being invested on private lands (IFMAT 1993). That report concluded that the federal government should turn primary responsibility for management of Native American lands over to tribal forestry programs, a move encouraged by federal laws and supported by the Intertribal Timber Council (ITC), a consortium of seventy-three Native American tribes and Alaska Native organizations (Morishima 1997). According to a 1997 assessment by the original IFMAT team (Gordon et al. 1997), however, there is still much to be done in implementing the report.

Tribal-based forestry programs for Native American lands have evolved considerably over the last decade as tribes assert more control over their resources. Nonetheless, even within tribes there are conflicts among leaders with economic development goals and those with cultural or ecological goals. Some Native American tribes have a long tradition of commercial forest management that includes strong ecosystem values. For instance, the Menominee Tribe of Wisconsin and the Yakima of Washington have been cited for their outstanding forest management programs, demonstrating in many cases that production of vital timber supplies does not preclude excellent ecosystem management, species protection, and protection of cultural values. The Menominee Tribal Enterprises and the Hoopa Tribe of California have, for example, been certified under the Forest Stewardship Council’s (FSC) program. They report that forest certification has opened up markets for new secondary products, increased the value of some less marketable species, and led to more forest jobs and products.

Trends in Forestland Ownership

Several large undercurrents in U.S. private forest ownership deserve to be highlighted. Just as forest ownerships, both public and private, form an interconnected mosaic, these trends interact as well. Their cumulative effects compound each individual trend. We will examine in turn the growing fragmentation, sprawl development, and de facto conversion of forest ownerships; the aging of individual forest owners; the restructuring of the forest industry; and the rise of financial owners. We will also note the emergence of conservation ownerships. The implications of these
<table>
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<th>Year</th>
<th>1978</th>
<th>1988</th>
<th>1998</th>
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<tr>
<td>Acres</td>
<td>60,700,000</td>
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<td>60,000,000</td>
<td>60,000,000</td>
</tr>
<tr>
<td>Percent</td>
<td>75%</td>
<td>75%</td>
<td>75%</td>
<td>75%</td>
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</table>

*According to an analysis prepared for this book by Thomas Fitch, the area table in the Forest Service and the results of an estimated 13% in the 1988-1998 period between the estimate of ownership by substantial owners with the area of forested land. In only approximately 68% of non-owner with the area of forested land. In only approximately 68% of non-owner.*
of forest owners. These new owners may also be more concerned with the ecological and amenity values of their forests than were previous owners, given the rough correlation between size of ownership and primacy of timber-related goals.

Regardless of the characteristics of the many new ownerships, smaller parcels and varying landowner goals in and of themselves create new issues for forest conservation. With more small parcels comes a denser and more extensive patchwork of built infrastructure and other nonforest features that alter larger-scale forest ecosystem functions. These include impacts to hydrological functions, fire regimes, and habitats for interior and wide-ranging native species. At a certain point the impact is great enough to consider the parcel to be converted from forest.

The sprawling nature of most urban development in the United States exacerbates the reach of the impacts, pushes the leading edge of nonforest development, and accelerates fragmentation of larger, intact properties. Large-scale fragmentation limits the ability of interested individual landowners to realize certain environmental goals within the patchwork of small parcels.

**Individual Landowners Are Aging**

As illustrated in figure 1-8 earlier in this chapter, as of 1994 an estimated 2.5 million individual forest owners were 65 years and older (27% of all individuals) and held 92.6 million acres or 23.5% of the total privately owned forests. At that time, another 2 million owners were estimated to be 55 to 64 years old, controlling an additional 54 million acres. Virtually all of the former and some of the latter properties will go through some sort of intergenerational transfer in the next twenty years. Any property transfer is a moment when tracts can be broken up and parcel sizes reduced. In the context of an estate settlement, this is all the more likely because of the host of succession issues: too many heirs, no heirs, heirs’ competing interests in property, no interest in property; and insufficient nonforest funding for estate taxes.

The scope of impact of intergenerational succession issues will vary from family to family, depending on the size and value of the forestland and its relative value within the estate. At current estate tax rates, and assuming a proportional representation of senior owners across size classes, our analy-

9 This is based on an estimated average value per acre of $2,000. Therefore, at current levels of estate tax and a unified credit of $1 million for a family business or for individuals (as is being phased in for individuals through 2006), single owners of more than 500 acres begin to incur tax liability, exclusive of residential value or other assets and assuming no estate plan is in place. The ability of landowners to pay the estate liability will, of course, depend on both the nature of their timber and nontimber assets.
A variety of financial vehicles and products are available or evolving for those who want to make a pure play in forestland ownership, but in a way that is more diversified, with lower risks and greater potential liquidity than direct ownership allows. These include large private limited partnership funds organized by TIMOs; publicly traded master limited partnerships (MLPs), such as Crown Pacific; and, with the reorganization of Plum Creek, publicly traded timber real estate investment trusts (REITs).

With growing investments by pension funds and with the advent of more publicly traded, tax-efficient forest investment vehicles, it is likely that financial ownership of U.S. private forests will accelerate. Many of the forestlands from which industrial corporations have divested themselves in the South, Northeast, and coastal California have gone into financial ownership.

Large-scale financial ownership does not in and of itself further forest conservation and sustainable management versus other forms of ownership. These owners are distinguished by not being tied to supplying a particular mill. They also have other management and marketing flexibilities that both large industrial and small nonindustrial owners generally lack.

Financial ownership has the potential to provide forest landowners with more consistent cash flows and investment liquidity than is possible through smaller, less diversified ownership or through other ownership structures. For smaller ownerships, liquidity is obtained through selling the timber or property. Sometimes the demand for liquidity leads to parcellization or overharvest. By assembling a large and diversified portfolio of forest holdings, cash flows can be smoothed while still harvesting timber sustainably. A secondary market for ownership units is also becoming available, presenting disruption of the forest due to change of ownership and thereby potentially promoting more consistent forest management.

On the other hand, more retail and indirect ownership of forests centralizes management control with financial managers, not with foresters, families, or communities. There is no guarantee that the demands of the capital markets for return from these forests will be any different than the demands experienced by the forest industry. Investment managers are evaluated by their ability to achieve certain benchmarks of return. Therefore, there is no reason these owners would have a longer-term perspective in their forest management than other large forest owners such as forest products companies.

Further, the market success of MLPs and REITs is driven by their distributions to unitholders. This puts pressure on forest managers to schedule timber harvests to meet the distribution objectives. For publicly traded timber entities, markets will still be especially challenged to provide sufficient recognition of the value of standing timber and other forest assets versus timber harvest cash flows (Brust and Jenkins 1999).

**Conservation Ownership of Managed Forestlands Is Emerging**

There is a small but noteworthy emergence of ownership of private, managed forestlands by conservation organizations. Traditionally, nonprofits have acquired environmentally valuable lands for transfer to public agencies. The Nature Conservancy and the Trust for Public Land are major examples of this kind of organization and transaction. Fee title lands held by conservation organizations have typically been managed as ecological preserves or quasi-public parkslands. In the late 1990s, The Nature Conservancy, the Conservation Fund, and the Vermont Land Trust acquired private "working" forests in the Northeast. While portions of these acquisitions are going into public ownership, the remaining forestlands are either (1) being held and managed for sustainable forestry and conservation purposes as demonstration forests; or (2) being resold to other forest landowners subject to conservation easements that restrict subdivision and guide forest management to protect ecological values.

In three transactions, approximately 506,000 acres of forest were acquired. Although only a small percentage of recent forest transactions, these high-profile acquisitions may be creating a new model of forest ownership that combines high standards of forest resource protection with commercial forestry operations. See the appendices for more information on these transactions.

10. The experience of U.S. Timberlands, a publicly traded partnership formed in 1990, is a case in point. As of 1999, the partnership owned 673,000 acres of forestland in Oregon and Washington. Its unitholders had rights to distributions of $5.50/unit per quarter. In order to maintain this level of cash flow, the company had to log at a much higher level than described in its offering prospectus. According to filings with the SEC, the company in fact logged at higher levels than its own estimated annual sustained yield of 110 million board feet. Its reported actual harvest levels have been 139 million board feet in 1997 and 145 million in 1998, with a planned 202 million board feet in 1999.