



Forestland Social Values and Open Space Preservation

ABSTRACT

Concerns have grown about the loss of forestland to development, leading to both public and private efforts to preserve forestland as open space. These lands comprise social values—ecological, scenic, recreation, and resource protection values—not typically reflected in market prices for land. When these values are present, it is up to public and private agencies to provide them in sufficient quantity. We discuss nonmarket social values in the context of forestland market values, to explain the economic rationale for public and private efforts to protect forestland as open space.

Keywords: forestland; nonmarket values; forest amenities; land use

Historically, many issues in US forest policy have involved heated exchanges between timber interests and environmental groups over the future of the nation's national forests. Debate about whether national forests should produce timber and rural economic opportunities, or pursue other objectives such as ecological restoration and recreation, gener-

ally ignored private lands. However, nearly three-fifths of the nation's forests are privately owned. Private forests also generate economic value and employment, and provide nonmarket scenic, recreation, ecological, and resource protection benefits. Private forests also have the potential to eventually be lost to nonforest, developed uses.

Despite significant population

growth and development in the past half century, US forestland area has remained relatively stable, declining 1% from 1953 to 1997 (Smith et al. 2004). Remaining forestland, however, is shared among more people. Forestland per capita has declined by half, from 5.0 ac to less than 2.7 ac per person, and by as much as two-thirds in specific regions like the Pacific Northwest (Figure 1). Almost 1 million ac of private forestland were lost to development each year from 1992 to 1997, with many important timber-producing states—California, Florida, Georgia, North Carolina, and Washington—experiencing the greatest losses (Natural Resources Conservation Service 2001). Projections suggest that another 26 million ac will be lost to development by 2030 (Alig and Plantinga 2004).

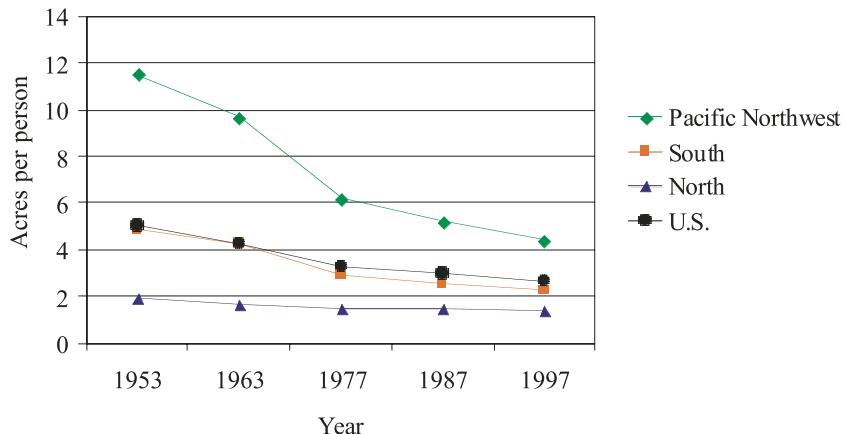


Figure 1. US forestland area per capita, 1952 to 1997. Area of public and private forestland (Smith et al. 2001) divided by people (US Bureau of Census 2000) for Pacific Northwest (OR, WA), South (AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, VA), North (CT, DE, IA, IL, IN, MA, MD, ME, MI, MN, MO, NH, NJ, NY, OH, PA, RI, VT, WI, WV), and United States.

When private forestland is developed, the market and nonmarket benefits it provides can be reduced or lost altogether. Market values for forestland are important to understanding financial issues affecting forestry, such as returns to timber production and development. Nonmarket values are important because they benefit society. Because nonmarket (social) benefits generally are not accounted for in market prices for land, it is up to public and private institutions to ensure that they are provided in sufficient quantity. We discuss nonmarket social values in the context of forestland market values to explain the economic rationale for public and private efforts to protect forestland as open space.

Open Space and Land Markets

Forestland typically is viewed by timber-producing landowners as a factor in the production of timber and nontimber forest products demanded in markets (for example, Aronow et al. 2004). Forestland market values derive from land's rent-earning capacity—its

ability to produce forest commodities for sale—as well as its speculative value in other potential uses such as development. Forestland owners also may receive other noncommodity benefits from their land, such as personal recreation and aesthetic enjoyment, and these private benefits also can be reflected in forestland market values. With development pressures, such as increasing demand for residential housing, development may offer forestland owners greater potential returns than forestry. When the potential rent-earning capacity of forestland in developed uses exceeds its potential rent-earning capacity in timber production, forestland owners have a financial incentive to develop.

The financial incentive to develop is the differential between the expected financial returns to forestry versus development. It can be quite high. Alig and Plantinga (2004) estimate the average present value of future returns of land in timber production for 473 counties in the southeastern United States at \$415 per acre, compared to its

value in residential housing at \$36,216—land with a developed value nearly 90 times higher than its forest value. Developed values in the Pacific Northwest Westside are estimated at 111 times higher than forest values. This financial land-use hierarchy means that private forestry returns alone are unlikely to keep some land in forest when development is an option.

Forestland also can involve significant nonmarket social benefits—values that contribute to the welfare of individuals as members of society. Economists call these public goods—there generally is no way of excluding nonpaying beneficiaries. Social benefits associated with private forestland include scenery, recreation, wildlife habitat, and water resource protection, among others. The value of these public benefits generally are not reflected in market prices of land, and private forestland owners have no financial incentive to consider them in their land-use decisions and market transactions. When forestland is developed, the social values provided by forestland as open space can be reduced or lost entirely. More forestland will be developed than is optimal from a social perspective. Some forms of development also can involve social values not always reflected in market prices, such as buildings with cultural or historic significance, but values derived from most common forms of residential, commercial, and industrial development typically are included in market prices.

Although forestland social values are not usually known in precise dollars, their existence is evidenced by their measurable economic influence. Forestland and open space can be important factors in individuals' residential location decisions (Kaplan and Austin 2004, Vogt and Marans 2004). Studies indicate that forest and open space amenities attract employment

Table 1. Value of open space voter approved municipal, county, and state bond and tax measures, 2001–2003, per capita and per acre nonfederal land.

| State | Open space funds, 2001–2003 (\$) | Per capita (\$) | Per acre nonfederal land (\$) |
|-------|----------------------------------|-----------------|-------------------------------|
| AR | 2,000,000 | 0.75 | 0.07 |
| AZ | 40,194,000 | 7.83 | 0.95 |
| CA | 3,993,988,000 | 117.92 | 75.34 |
| CO | 749,905,659 | 174.35 | 17.64 |
| CT | 36,275,000 | 10.65 | 11.89 |
| FL | 130,550,000 | 8.17 | 4.25 |
| GA | 164,300,000 | 20.07 | 4.75 |
| HI | 25,000,000 | 20.63 | 6.68 |
| IA | 4,970,000 | 1.70 | 0.14 |
| ID | 10,000,000 | 7.73 | 0.52 |
| IL | 151,715,349 | 12.22 | 4.35 |
| MA | 166,702,967 | 26.26 | 34.21 |
| MD | 4,525,000 | 0.85 | 0.75 |
| ME | 5,500,000 | 4.31 | 0.28 |
| MI | 100,872,500 | 10.15 | 3.06 |
| MN | 38,135,000 | 7.75 | 0.80 |
| MO | 18,700,000 | 3.34 | 0.45 |
| MT | 2,500,000 | 2.77 | 0.04 |
| NC | 90,700,000 | 11.27 | 3.19 |
| NH | 40,227,000 | 32.55 | 8.14 |
| NJ | 1,128,001,291 | 134.06 | 248.25 |
| NM | 8,039,000 | 4.42 | 0.16 |
| NV | 89,500,000 | 44.79 | 8.56 |
| NY | 476,614,614 | 25.12 | 15.95 |
| OH | 68,687,500 | 6.05 | 2.67 |
| OK | 3,033,320 | 0.88 | 0.07 |
| OR | 4,550,000 | 1.33 | 0.15 |
| PA | 411,433,000 | 33.50 | 14.80 |
| RI | 3,720,000 | 3.55 | 5.65 |
| SC | 236,500,000 | 58.95 | 13.06 |
| TX | 243,289,000 | 11.67 | 1.48 |
| UT | 5,400,000 | 2.42 | 0.30 |
| VA | 60,000,000 | 8.48 | 2.67 |
| VT | 60,000 | 0.10 | 0.01 |
| WA | 19,000,000 | 3.22 | 0.62 |
| WY | 8,450,000 | 17.11 | 0.25 |

NOTE: Includes the 36 states in which municipal, county, or state bond and/or tax measures were approved, 2001–2003. Value of open space funds in nominal dollars and estimated by Trust for Public Land (2002, 2003, 2004), population data from US Bureau of the Census (2000), and nonfederal land from Natural Resources Conservation Service (2000).

and in-migration of working people and retirees and tend to increase the value of nearby housing (see Garber-Yonts 2004 for a review). Property value effects can be greater when open space is permanently protected (Geoghegan 2002). Forest and open space amenities also can be associated with lower wage rates (Duffy-Deno 1998, Deller et al. 2001), suggesting that immigrants are willing to accept lower incomes to live in amenity-rich locations. Judson et al. (1999) found that among middle-aged (40–64 years of age) immigrants in Oregon, those citing natural amenities as the reason for moving experienced annual household income reductions averaging over \$10,000. Ur-

banites are migrating to rural areas seeking a better quality of life—easy access to outdoor recreation and forest and open space amenities (Egan and Luloff 2000).

The Marginal Value of Open Space

Forestland social values derive from ecological, recreation, aesthetic, and resource protection benefits that contribute to our quality of life. Conceptually, many of the marginal values society holds for forestland—the social values held for an additional acre—depend on how much development has encroached on forest landscapes. All else being equal, a large undeveloped forest landscape usually will be per-

ceived as offering better scenery, more and less crowded recreation opportunities, and greater habitat and resource protection benefits than a smaller more-developed forest landscape. In rural areas having significant forestland area, marginal social values are likely perceived low. Losing some forestland to development may matter little, because a lot of other forestland remains. Development may even be welcomed. In more populated areas, where development is changing forest landscapes, marginal social values are likely perceived higher—people see that forestland is becoming scarce. Losing additional forestland in more populated places means more significant marginal reductions in ecological, recreation, aesthetic, and resource protection benefits valued by society.

The relationship between diminishing open space and increasing public demand for its preservation exists with farmland. Voter support for preserving farmland has been highest in places experiencing the most rapid increases in population and decreases in farmland (Kline and Wichelns 1994). The earliest state-level programs tended to be located in the northeast, in the more populated and rapidly growing states of Connecticut, Maryland, Massachusetts, New Jersey, Pennsylvania, and Rhode Island. Of 22 states with active programs (American Farmland Trust 1997), those most densely populated pursue the widest array of rural amenities—open space, wildlife habitat, natural areas, scenic beauty, rural character—while concerns of less populated states are narrower (Hellerstein et al. 2002).

Other anecdotal evidence is the financial commitment to open space funding in New Jersey, the most developed state in the United States in population density terms, with 1,134 people per square mile compared to 95 people per square mile for the United States excluding Alaska (US Bureau of Census 2000). Despite its large population and persistent development pressures, New Jersey still comprises many heavily forested landscapes, and residents clearly want to maintain them. All 21 counties and 189 municipalities in the state have dedicated open space taxes, totaling

Table 2. Conservation easements purchased on forestland under the Forest Legacy Program, 1992–2001.

| State | Number | Acres | Average cost per acre (\$) |
|-------|--------|--------|----------------------------|
| CA | 2 | 3,275 | 1,481 |
| CT | 3 | 352 | 1,108 |
| IL | 3 | 143 | 4,084 |
| MA | 9 | 1,252 | 4,983 |
| MD | 3 | 668 | 1,160 |
| ME | 5 | 31,398 | 232 |
| MN | 1 | 111 | 2,144 |
| MT | 1 | 13,320 | 172 |
| NC | 1 | 1,082 | 2,115 |
| NH | 4 | 4,804 | 194 |
| NJ | 1 | 700 | 2,000 |
| NY | 2 | 260 | 792 |
| RI | 5 | 598 | 2,140 |
| UT | 7 | 20,514 | 1,047 |
| VT | 9 | 44,182 | 126 |
| WA | 5 | 2,504 | 4,982 |

NOTE: Includes those states having closed conservation easement transactions (Forest Legacy Program 2002). Average costs per acre are weighted by easement acres purchased and adjusted for inflation to 2002 dollars using the Consumer Price Index.

more than \$200 million in annual local funding. Also, a 1998 state constitutional amendment allocates \$98 million of annual sales tax revenues to open space protection for the next 30 years (Trust for Public Land 2004). This is on top of millions of dollars already committed to farmland and open space preservation in recent decades.

The increasing values society holds for open space are rooted in many factors, with some individuals concerned about ecological protection, others about protecting environmental amenities and quality of life, and still others about conserving natural resources such as timber and clean water (DeHaven-Smith 1988). Community identity also can play a role, when communities worry about the magnitude, location, rapidity, and appropriateness of environmental changes caused by development. Communities become protective of traditional landscapes and places with symbolic or community connections—stability of identity in the face of change (Sell and Zube 1986). Whatever the reasons, when the marginal social value of undeveloped lands rises above the marginal social value of land in developed uses, an economic argument exists for public and private agencies to protect open space. From a social perspective, preservation becomes efficient—its social benefits exceed its costs.

Open Space Preservation

Both governments and private conservation organizations intervene to correct “market failures” associated with loss of forestland as open space. Public policies and programs arise from the political process when enough voters become sufficiently concerned about open space lost to development (Wolfram 1981). Policies and programs include, among others, municipal, county, and state land-use regulations, state use-value assessment programs that reduce property taxes on forest and farm lands, and programs that purchase development rights, conservation easements, or land in fee (see Bengston et al. 2004 for a review). Many federal policies and programs, such as agricultural programs, also have land conservation effects. Although the goals of different policies and programs vary—some, such as land-use regulations, usually are not enacted solely to protect open space—they all have open space implications and often garner widespread support among voters in rapidly growing places.

Public support for regulating land use is evidenced in those places where land-use planning programs are implemented. Use-value assessment programs exist in all 50 states. However, the most direct measure of public support for protecting open space is voting on bond and tax referenda used to fi-

nance public open space programs. Since 2001, voters in 36 states have approved municipal, county, and state open space bond and tax measures totaling \$8.5 billion. The geographic distribution of funding per capita shows relatively broad support nationally, with the exceptions of the Great Plains and central states (Figure 2). Per acre, the greatest support exists in many rapidly urbanizing states—northeastern and Lake states, California, Florida, Texas, and Appalachian states (Hellerstein et al. 2002). California and New Jersey, portions of which comprise some of the most densely populated landscapes in the United States, fund open space into the billions of dollars (Table 1).

Private open space preservation usually involves purchasing land in fee or conservation easements restricting development. Donations of land and easements to qualified conservation organizations are eligible as charitable contribution deductions for federal income tax purposes. The Internal Revenue Service defines “conservation purposes” as preserving land for outdoor recreation, protection of natural habitat and ecosystems, or preserving open space for scenic enjoyment or historic preservation, or any other objective consistent with federal, state, or local conservation policy (Land Trust Alliance 1990). Easements also may specify additional directives, such as limits on certain forestry practices or guarantees of public access for certain types of recreation (Land Trust Alliance 2001b).

Recent noteworthy examples abound. In 1998, The Nature Conservancy purchased 185,000 ac of forestland in fee from International Paper Company for \$35 million. In 2001, the New England Forestry Foundation purchased a conservation easement on 762,192 ac of private-owned forestland in northern Maine for \$28,142,316 (Goldberg 2001). A growing trend is blending public and private participation. In 1998, the Conservation Fund purchased 300,000 ac of forestland from Champion International Company in a \$76 million deal involving New York, Vermont, and New Hampshire (Revkin 1998). In 2002, The Nature Conservancy partnered with New

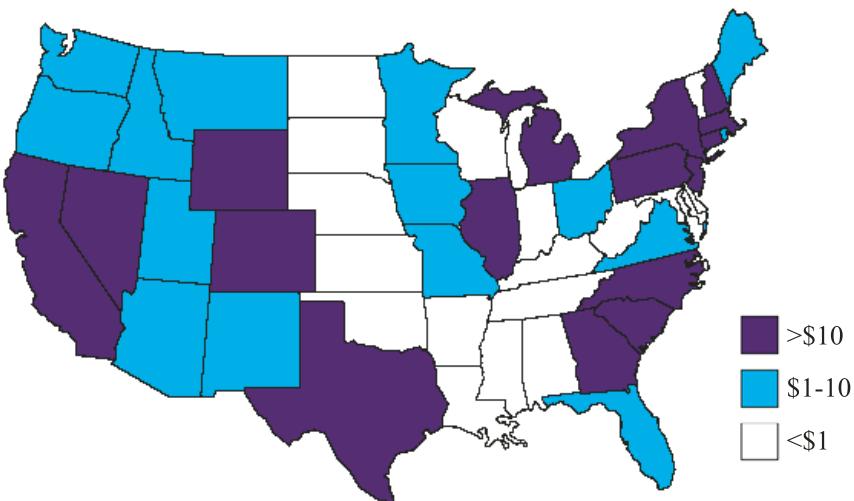


Figure 2. Open space funding per capita, 2001-2003. Estimated value of open space funds provided by voter-approved municipal, county, and state bond and tax measures (Trust for Public Land 2002, 2003, 2004) divided by people (US Bureau of Census 2000). Actual figures provided in Table 1.

York to purchase conservation easements and land in fee on 44,650 ac for a combined \$9.1 million (Perez-Pena 2002).

Adding to forestland protection activities of large conservation organizations are many land trusts working at regional and local levels. Land trusts are nonprofit organizations working through voluntary means to protect land they deem important to the quality of life and environmental health of their communities, states, or regions. There are 1,263 land trusts in the United States operating in all 50 states. Their specific goals vary—52% include wetlands among their conservation objectives, followed by river corridors (51%), watersheds (47%), farm and ranchland (46%), nature preserves (45%), general open space (43%), endangered species habitat (42%), scenic views (34%), recreational trails (27%), historic places (24%), coastal resources (18%), timberland (14%), and urban open space (10%). Land trusts own 1,247,342 ac of open space in fee, hold conservation easements on an additional 2,589,619 ac, and have preserved an additional 2,388,264 ac by other means, often transferring ownership to third parties including states (Land Trust Alliance 2001a).

Open Space Values and Preservation Costs

Costs incurred by land trusts and

other conservation organizations to preserve open space are not systematically reported. However, forestland protection activities under the federal Forest Legacy Program provide some indication of how much participating land trusts and other conservation organizations are willing to pay to preserve forestland. The Forest Legacy Program was created by the Cooperative Forestry Assistance Act of 1978, as amended by the 1990 and 1996 Farm Bills. It is a voluntary private land conservation program between the USDA Forest Service, states, land trusts, and private landowners, providing federal financial assistance leveraged by non-federal cost sharing to protect forestland (Forest Legacy Program 2002).

From 1992 through 2001, Forest Legacy Program funds contributed to purchasing conservation easements on 125,163 ac of forestland in 16 states, totaling \$68 million or about \$546 per acre. Along with purchasing easements, the Program has protected an additional 26,295 ac of forestland through purchases of land in fee or combinations in fee and conservation easement purchase, at a cost of \$36 million. Average easement costs in individual states vary from a low of \$126 per acre in Vermont to \$4,983 per acre in Massachusetts (Table 2). The market value of a conservation easement reflects the development value of land it encumbers net the residual value of the

land in its preserved state (Land Trust Alliance 1990). Variations in easement costs reflect regional differences in the development value of forestland net its preserved value, as well as differences in the characteristics of individual parcels, transactions, and easement restrictions.

Reasonably, the costs borne by land trusts and other conservation organizations to preserve forestland reflect those organizations' perception of value toward meeting their conservation objectives. If The Nature Conservancy is willing to pay \$35 million to purchase 185,000 ac of northern Maine woods (Goldberg 2001) "to preserve the plants, animals and natural communities that represent the diversity of life on Earth" (The Nature Conservancy 2004, p. 40), they must perceive that the incremental benefit of protecting that 185,000 ac from development (and perhaps intensive timber harvesting) is at least equal to \$35 million. Given that The Nature Conservancy depends on voluntary contributions, the actual social value likely is greater. Conversely, if International Paper Company is willing to sell land at that price (Goldberg 2001), they must perceive that the capitalized value of future timber revenue to be earned on that land (as well as its potential value in developed uses) is less than \$35 million.

What is valuable to some may not be valuable to others. Some rural communities feel such restrictions on development and logging curb economic activity, although empirical evidence tends to refute such claims (Lewis et al. 2002). Some feel they have plenty of open space, but too few jobs. Some worry about losing access to certain recreation activities, such as hunting or off-road vehicle use that may be disallowed on protected lands. By reducing the fair market value of land, conservation easements can reduce local property tax revenue (Wiebe et al. 1996). These perceptions also can apply to public protection efforts. Public forestland ownership also pulls land from property tax rolls. Use-value assessment programs reduce property taxes on large tracts of private forestland, shifting tax burdens onto landowners unable to participate (Newman et al.

2000). These shifts can be greatest in rural areas where a greater proportion of land likely is enrolled. Rural communities may view forestland protection policies and programs as unfair if their political support is concentrated in distant cities with seemingly no day-to-day connection to rural communities. In answer, conservation organizations often say that preserving forestland fosters economic development by increasing recreation and tourism.

This clash of views has no easy solution. On one side, forestland preservation by land trusts and other conservation organizations is an outcome of free markets, whereby easements and land are transferred from willing sellers to willing buyers, to pursue what are perceived by those organizations as higher and better uses—that is, conservation. As nonprofits, these organizations may have an upper hand in land markets, because landowners can treat partial donations of easements and land as charitable contributions for federal income tax purposes. Pending federal legislation would even authorize a pilot program allowing Evergreen Land Trust in Washington State to raise preservation funds by selling tax-free bonds (108th Congress, H.R. 1308 2004). However, in our democratic society we implicitly endorse the work of land trusts and conservation organizations through legislation enabling their nonprofit status and tax code defining conservation easements. On the other side, rural communities opposed to forestland protection may question the calculus land trusts and conservation organizations use in their perceptions of value. They may feel that preserving forestland for ecological, aesthetic, or recreation purposes is misguided or inadequately considers the net effects on society—they may compute a lower marginal social value.

Some conservation organizations increasingly recognize the concerns of rural communities in forestland protection efforts. Portions of the 300,000-ac multistate Conservation Fund purchase from Champion International Company were to be transferred to the Forestland Group, a private investing group specializing in sus-

tainable forestry, who would continue limited timber harvesting (Revkin 1998). The 762,192-ac conservation easement purchased in Maine by the New England Forestry Foundation also will allow some logging (Goldberg 2001). The 44,650-ac joint Nature Conservancy/New York conservation easement purchase includes funds to develop a management plan allowing continued logging and hunting (Perez-Pena 2002).

Forest Management and Policy Challenges

The earliest significant open space preservation efforts in the United States involved preserving and restoring publicly owned forests and parks at national and state levels. Inspired by public concern for rapid loss of forests to agriculture and logging in the later 19th century, these efforts focused on protecting timber and water resources and lands of extraordinary beauty and uniqueness (Fredrick and Sedjo 1991). Since then, public concern for land-use change has evolved to recognize the contribution of open space to our day-to-day quality of life—its recreation, aesthetic, ecological, and resource protection benefits.

Changing perceptions about forestland mirror those in farmland preservation. National interest in preserving farmland arose in the 1970s from concerns about rapid loss of farmland to development and the supposed threat to food security and agricultural viability. These concerns led to the gradual nearly nationwide implementation of local, state, and federal farmland preservation programs. More recently, recognition has grown for the environmental amenities—the social values—of farmland and the role they play in motivating public support for preserving farmland. Research over the past two decades has sought to identify these values and incorporate them into farmland protection policies and programs, to ensure that the public is getting what it desires from preserved farmland. Similar efforts may now be needed in forestry, to ensure that public and private open space protection efforts are appropriately tailored to

provide the social values desired from forestland.

From a landscape perspective, both public and private open space preservation efforts have limitations. Land-use regulations simply restrict land to broad use classes and are limited by what courts will allow under takings provisions of the US Constitution. Use-value assessment programs generally do not differentiate between lands of significant social value and lands of little value; society may pay more in higher property taxes than it receives in social benefits. Neither land-use regulations nor use-value assessment are permanent. Purchasing conservation easements and land in fee is more lasting and can be selective in the social benefits protected. However, these methods are expensive and limited to identifying willing sellers, often producing at best a spotty patchwork of protected land. Protecting some lands into perpetuity may be unnecessary if they have little development potential or landowners are unlikely to develop.

To better pursue landscape-level goals, some conservation organizations now offer financial incentives to landowners who pursue conservation objectives. For example, The Nature Conservancy offers annual payments to forestland owners in Virginia who curtail logging, with the resulting “forest bank” managed using an “ecosystem-based approach” including some limited timber harvesting (Dedrick et al. 2000, p. 22). Public agencies have initiated similar programs. The new federal Healthy Forests Reserve Program will enroll private forestland under 10-year management agreements to enhance endangered species habitat and authorizes purchasing 30- and 99-year conservation easements (108th Congress, H.R. 1904 2003). Such programs, along with landowner education and technical assistance, may enable organizations and agencies to pursue landscape-level conservation objectives at lower cost by changing landowner behavior versus purchasing easements and land.

The demand for and supply of market and nonmarket forest goods and services are ever changing. National

timber harvests are becoming more concentrated geographically, with the South now harvesting more timber than other regions and countries (Wear and Greis 2002). Although regional and international market forces have a range of implications for private forestry nationwide (Haynes 2003), a combination of market and nonmarket factors shape the values society holds for forestland. Increasing interest in the social values provided by forestland in the United States comes from greater demands for social benefits on public lands and loss of comparable private lands to development. Natural resource management goals at the dawn of the 21st century are diverse—stable timber supply, watershed protection, biodiversity protection, carbon sequestration, and open space preservation. Resource managers and policymakers increasingly will need to find ways to pursue these goals on a gradually diminishing forest landscape. This will include considering how forestland social values evolve and reflecting them in forest management and policy.

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