Forestland Values

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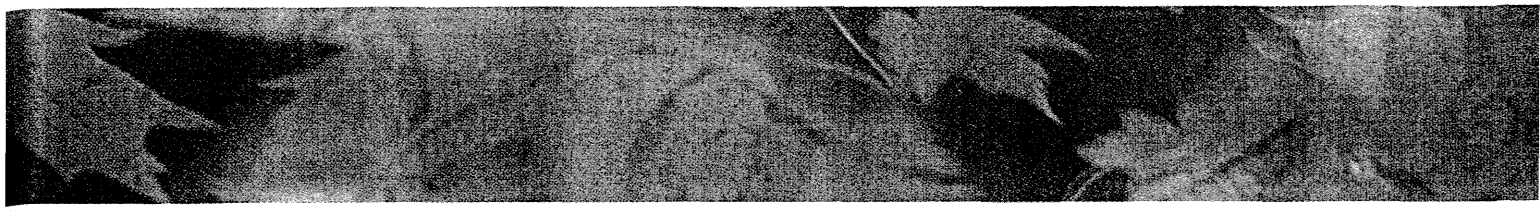
With what you have to pay for forest land these days, you can't afford to use it to grow timber.
—comment made recently by an eminent southern US forest economist

This issue of the *Journal of Forestry* is devoted to articles about forestland values. Viewed broadly, natural resources and humans are our two basic resources. An expression of the importance of land as a foundation for forest ecosystems is forestland value. Our attitudes about land and the forest ecosystems that they support have changed considerably in recent years. In earlier decades, forestland value as expressed by markets was mainly a private land issue, driven by the value of standing timber and the bare land's capability to produce subsequent crops of timber. The main reasons for conversion of forestland to other uses were "higher and better" nonforest alternatives; higher and better referring to more valuable market uses of the land than growing timber.

Today, higher and better alternatives still exist. Forest-use valuation is increasingly becoming more complicated, as is our economy, by overlays of land-use zoning, environmental laws, forest practices regulation, site-specific environmental considerations, and recognition of forest resource values other than timber. As an example of the latter, the quote above was not made with reference to higher and better nonforest use, such as urban development, but instead with reference to another forest use—wildlife. Market values for forestland in that instance were being driven by the value of hunting rights, not timber production.

Much discussion in forest policy circles today is about forest sustainability, which seems to be part of a larger societal concern about sustainability of land to provide the goods and services that we as a society demand. However, given Will Rogers' reminder that "they aren't making any more land," we need to ask what prices we are willing to pay for those goods and services. Land markets provide evidence on revealed behavior about what people are willing to actually pay for a bundle of rights necessary to gain access to land that can provide goods and services into perpetuity. However, due to market failures and the nature of some forest-



land values, markets do not always reveal true forestland values, which is discussed more below.

Who Cares About Forestland Value?

History contains many stories of humanity's high regard for land in past times. For centuries, most wars were fought for the possession of land, and most people lived in close association with the soil, fields, and forests that provided them sustenance. In the last century, Aldo Leopold's land ethic enlarged the boundaries of the community to include soils, waters, plants, and animals, or, collectively, the land.[1] He pointed out the complexity of the "land organism." Human ties to land and the natural environment are one reason that we care about forestland value. Forestland values help us understand the importance of forests and to marshal land resources so that they might be used effectively and efficiently to help provide people with higher levels of living. Forestland values help us to plan for better land use, to take steps for the more orderly and effective use of our land resources, and to intervene where necessary with land-use zoning ordinances and other public measures to control and direct land-use practices in the public interest.

Valuation of forests varies widely around the world. In Europe, Japan, and the United States, well over half of the forest and wooded land is privately owned (Food and Agriculture Organization 2001). In contrast, a large majority in Canada and Australia is publicly owned. In many of the Central and Eastern European countries with economies in transition, the forest ownership pattern is undergoing substantial change as forestland is restituted to its former owners or privatized. Experience in centrally planned economies of the world, where forests are usually owned by the government, shows that forestland value is rarely an issue. Forests are viewed as common property with rights of use dispensed by the government, either arbitrarily by dictatorships or by some combination of forest law and policy in more representative forms of government. That is not to say that productivity differences are not recognized and valued implicitly, just that it is rare to find someone who has a sense of the market value per acre of a given tract.

Forestland value is more of an issue in countries with private forest ownership. Forestland value plays a critical role in transactions in the marketplace when land is bought, sold, mortgaged, or leased. It is needed as well for assessment of property and inheritance taxes. It is needed for choosing among land-use alternatives. In an unrestricted market economy, private forests uses have to compete with nonforest land-use alternatives. Actions that affect values for forest uses, such as zoning, taxation, and regulation, may provide incentives for the landowner to seek a higher-valued alternative, which can mean shifting to a nonforest use. On the other hand, forestland values can be enhanced by wise forest management (e.g., increased vigor of overstocked forest stands or restoration of certain forest ecosystems) and recognition of all the values that a forest produces.

Much public land allocation involves the political process. The economic worth of nonmarket goods and services provided by forest ecosystems currently is intertwined in a number of forest policy debates, including those over the healthy forest issue and restoration of forested ecosystems after a major disturbance such as fire. Forest ecosystems generate a wide variety of use values, the most important of which nationally are the timber values discussed above, but also include nontimber products and services such as recreation, wildlife habitat, and watershed services. Conflicts frequently arise between private land resource development goals and the social interests of the community. Society's interests in conservation are expressed at times through group action and our political process, though market failures and prohibitive transactions costs of large groups making a bid can make it difficult for society to express those interests. Kline et al. (2004) discuss nonmarket (social) benefits generally not accounted for in market prices for land and how public and private institutions can intervene to correct market failures associated with loss of forestland as open space. Public agencies use a variety of tools to promote society's desired land-use mix, including taxation, police power, power of eminent domain and public ownership, and public spending.

Determinants of Land Value

In theory, forestland has current market value equal to the present value of expected future net benefits. The valuation process is complicated by lack of perfect knowledge and foresight about future benefits and costs of land management. Part of the uncertainty involves the bundle of rights that a private owner can hold in landed property in our society. It is important to understand that one does not own a forest in perpetuity. What is owned is a bundle of rights in the land that may or may not be transferable and that is subject to restriction by the police power of the government exercised in the interest of public health, safety, and welfare. Unrestricted, the landowner possesses the right to do anything he or she wants with the land, without regard for the environment or external costs to neighbors and the public at large. Legally, unrestricted land use is a thing of the

past in most of the world. In the United States, federal, state, and maybe even local laws restrict the bundle of rights possessed by forest landowners.

The nature of the restrictions varies state to state, as does their impact on land value. Oregon, for example, has comprehensive land-use planning that specifies exclusive forest use for most private forestland outside designated urban development boundaries. Forestland value in Oregon is limited typically to whatever values are inherent in forest uses, and usually the maximum value is timber production.

Oregon also has a strict forest practices law that regulates forest management and logging on private and other nonfederal land, and sets standards for reforestation. These legal requirements affect timber productivity by limiting options and increasing costs, thereby decreasing private forestland values.[2] Federal land agencies generally follow or exceed such standards.

Evidence from land markets is important in appraising private land values. Professional appraisers are governed by the Uniform Standards of Professional Appraisal Practices (USPAP). In addition to providing ethical standards, USPAP restricts speculation on the part of the appraiser by limiting the appraisal to the estimated transaction value of a willing buyer and willing seller, neither under compulsion to make a deal. Appraisers use comparable sales or income potential to set forestland values, accounting for all possibilities and restrictions. USPAP appraisals have high credibility in legal proceedings, but can be questionable in certain anomalous situations.

Some Anomalies in Valuing Forestland

Assume a 200-ac tract of uniform mature harvestable timber valued at $2 million. Now suppose a spotted owl is discovered to be nesting in the middle of the tract. The state immediately establishes a 100-ac core area around the nest, in which access is restricted and harvesting is prohibited as long as the owl uses the nest site. What's the fair market value of the tract the day the state designates the core area?

An economist might reason that the spotted owl, having a lifespan of about 15 years, would be gone in 15 years or less. Accounting for some expectation for the owl's departure or death, growth of the timber in the core area, price trends, and the value of future rotations of timber, the economist would come up with discounted expected value for the timber in the core area. The present value of the entire property to the economist (assuming no change in market value over time) would probably be in the neighborhood of $1.4–1.6 million, the sum of $1 million for the unencumbered half of the property plus the discounted expected value of the core area.

A USPAP appraiser is not likely to speculate about the departure or demise of the owl. Instead, a market search would be made to find transactions of owl-encumbered timberland. If market players were valuing owl habitat on its own merit or speculating on the economist's expectation, the appraiser could use those transactions on which to base the appraisal of the core area. Lacking such transaction evidence, or if no evidence exists regarding transactions by conservation groups that were willing to buy prime owl habitat, the core area could well be appraised as having little or no market value.

Another anomalous situation occurs in determining bare land values. You can estimate bare land value by projecting a timber management regime into the future and discounting the anticipated cost and revenues to the present to obtain a net present value (or soil expectation value) for the bare land. The resulting value is what one can afford to pay for the bare land, with the expectation of receiving a rate of return on the timber-growing investment equal to the discount rate used. More often than not, cutover (bare) forestland goes for more than is justified by the timber management calculation. That's explained when there are higher and better land-use options. It can also arise if an owner is interested in multiple forest-related uses and derives value from nontimber and nonmarket goods and services (e.g., recreation), as well as from timber that is traded in the marketplace.

Forestland values are also affected by demand-side factors such as number of potential owners desiring forestland. Between 1993 and 2003, the number of family forest owners in the United States increased by 13%, from 9.2 to 10.4 million, while their acreage increased at a slower rate of 10% (Butler and Leatherberry 2004). The increased number of smaller landholdings is the result of conversion of nonforestland to forestland (i.e., afforestation) and the breaking up of larger parcels into smaller parcels (i.e., parcelization). Most of the increase in number of forest owners is for those holding less than 50 ac of forestland. The relative importance of these trends varies across the country. Nine out of 10 private forest owners in the United States own less than 50 ac of forestland, and about 90% of family forest owners are in the eastern United States (Butler and Leatherberry 2004). Given current socioeconomic conditions with a growing and aging population, it is likely that the trend of more owners owning smaller parcels of forestland will continue. The negative relationship between per-acre management costs and parcel size hinders effective, economical forest management on smaller parcels. However, forestland values may be higher than could be expected based on timber production alone, with studies indicating that many owners desire forestland for more than timber production potential (e.g., Kline et al. 2000). Furthermore, the market values of such forest parcels are affected by location, including proximity to urbanizing areas. No doubt many more valuation anomalies can be cited. The intent here is to cite a few valuation anomalies to stimulate thinking about forestland values in preparation for reading the articles that follow.

The Bigger Forest Valuation Challenge

From an environmental and quality-of-life perspective, there's much interest around the world in conservation of land resources and keeping or enlarging land area in forest cover. One way to ensure that likelihood in market-driven economies is for forest uses to be economically competitive with nonforest uses of the land. Technological changes affect the value of land in different uses. Technological changes

in the 20th century that significantly boosted agricultural productivity per acre allowed some forest acres to be spared from conversion and encouraged the reversion of marginal lands to forest. Where forest uses can't compete in the traditional marketplace, the desire to preserve forest cover may require subsidies, publicly owned forest reserves, or actions by nonprofit land conservation groups (see, for example, discussion of land trusts by Kline et al. 2004).

Institutional factors can affect forestland values, with examples being public ownership and the institutional acceptability of policies and programs that must comply with constitutions, laws, ordinances, and public regulations. These institutional factors are part of the overall societal framework affecting land use, with the other two major components being physical/biological/ecological considerations and economic feasibility. With regard to economic feasibility, private ownership tends to take its signals from the marketplace and gravitate toward available forestland that is more productive of things that have market value. Earlier it was mentioned that much of the world's forestland is in public ownership and that forestland value is usually not much of an issue. We think it should be an issue, even on public lands. Regardless of ownership, forests should be viewed as national assets and managed to maximize net public benefit, environmentally, socially, and economically. In that case, forestland values get sorted out and constantly updated to reflect ever-changing economies and cultural values.

It is rare for land values to be sorted out formally on publicly owned forests, but there is increasing interest in doing so. New Zealand provides a prime example involving public forests, where the government divested its higher-site timberlands (mainly plantations) to the private sector and retained naturally regenerated forests on which forest uses (e.g., wildlife habitat) couldn't typically compete in the marketplace or had higher perceived environmental or cultural values. As countries such as Russia, China, and Vietnam transition from central planning to market-driven economies, issues of forest ownership and land tenure have arisen. Some sense of forestland value is needed as alternatives are considered. For example, British Columbia is considering the effects on land values and public benefits of possible divestiture to private ownership of some Crown-owned forestland.

Another intriguing aspect of forestland value has to do with afforestation—creating forests where they didn't exist before—or reforestation of understocked or degraded lands. Examples exist in New Zealand, Chile, and Ireland. In each of those cases, government action jump-started interest in forest-based economic activity, which in turn increased the demand for land suitable for growing trees. As obvious forestland became scarce, attention turned to pasture and scrubland, a lot of which probably never had forest cover.[3] Not only does this add to the world's forest cover, it has the economic advantage of creating value where it didn't exist before. Forest use emerged as the highest and best use of land that was previously of marginal economic value.

Studies Involving Forest Valuation

Six articles follow that discuss different aspects of forestland valuation. These articles are examples of what we know and don't know about forestland values and influences of such values on policy deliberations and their implications for future use of forestland. In the first article, Adams and Latta show impacts on land values in eastern Oregon from increasing the vigor of overstocked stands on national forests through thinning of relatively large volumes of sawtimber over one- to two-decade programs (or possibly longer if sustained improvements in forest health are sought). Fuels management in forests is an area of increasing concern, and they consider a range of thinning programs in terms of duration, volume removed, and costs of hazard/deadwood removal, looking at the price and land value variation within these options.

Aronow, Washburn, and Binkley find that financial fortunes of timberland investors are usually dictated by conditions in markets for timberland properties. This article develops historical series of timberland property values in the US South and US Pacific Northwest. They then use these historical series to examine the influence of timber prices and interest rates on timberland values in each region.

Alig and Plantinga examine the likelihood in our market-driven economy that private timberland will be economically competitive with nonforest uses of the land over the next several decades. Shifting patterns of land use in the United States are associated with many of today's environmental concerns. Based on signals in the marketplace, private land tends to move toward the highest and best allowable use. Socioeconomic forces such as population growth and personal income changes have markedly affected those marketplace signals in recent decades, and US population growth looms as a major issue for foresters, policy makers, and resource managers.

Wear and Newman complement the Alig and Plantinga article by taking a closer look in the South, a region with dynamic land use. With projections for large amounts of forestland to be converted to urban and developed uses, Wear and Newman discuss the speculative shadow of development affecting timberland use. If owners are expecting that a higher and better use can offer more rewards in land markets, their propensity to invest in forest practices may be altered as they wait for the land to ripen for alternative use. Around areas such as Atlanta, this can affect substantial amounts of forestland. The speculative shadow of timberland value change is related to population growth and personal income levels, key socioeconomic trends.

Bigsby discusses the New Zealand experience that includes creating forests on previously unforested land, alongside a government policy to divest of higher-site public timberlands to the private sector, while retaining land on which forest uses can't compete in the marketplace. Part of this New Zealand experience includes increased investments in plantation forestry by holders of smaller land tracts, including afforestation of former agricultural land

in a country quite sensitive to world market changes. Forestland values are linked across countries via markets for timber and other forest-based goods and services.

Kline, Alig, and Garber-Yonts examine the questions of public goods, externalities, and cases of land retained for forest uses to ensure that such forests are not likely to be converted to other uses in the future. They look at valuation of conservation easements and other partial interests in land and government-funded legacy programs to retain forests. They compare tools to retain forest cover to earlier programs in agriculture that evolved more to protect open or green space than to promote the use of land for commodity production.

In addition, prospects of emerging markets for other land products or services also come onto the long-range radar screen of those dealing with forest policy. An example is the value to society and private individuals of carbon stored in forests that aids in climate change mitigation. Emerging markets may involve speculative elements and often include nontraditional markets for forest goods and services for which valuation information may be notably more limited than for commodity-related products. Carbon sequestration opportunities exist on both private and public forests, and often are a byproduct of forest management for other purposes. Increasingly, public land managers are faced with demands arising from passive-use values such as the knowledge that specific ecosystems exist or will be available for future generations to enjoy. Given space limitations, discussion of such topics is outside the scope of this issue, but interested readers are referred to summary articles such as Kramer et al. (2003).

Society's preferences for land use are expressed through markets as well as through government by means of zoning, tax policy, and other measures. Resource managers and policy makers will increasingly need to pursue diverse goals—sufficient timber supplies, watershed protection, biodiversity protection, carbon sequestration, and open space provisions—on forested landscapes that are shrinking in some locations. Land managers and policy makers can benefit from better information about society's values for forestland and associated resources. This includes more extensive examination of the magnitude and distribution of fiscal and other financial impacts of forestland conservation relative to the social values gained. For example, research could quantify the economic impacts and benefits of forest resources to communities increasingly reliant on noncommodity uses of forests, such as scenic backdrop for residential and recreational development, and would examine underlying factors at local, regional, and national scales. Land-use changes in the United States result from countless decisions made by individuals, corporations, nongovernmental organizations, and governments. Managers and policy makers will face growing challenges if social valuation and technological aspects of land-use change at an accelerating pace. The importance of forests in environmental, economic, and social terms, however, warrant the increased attention by society.

Endnotes

[1] Aldo Leopold's essay "The Land Ethic" was published in an early form in the *Journal of Forestry* more than 50 years ago. Leopold reminded us that "We shall never achieve harmony with land, any more than we shall achieve absolute justice or liberty for people. In these higher aspirations the important thing is not to achieve, but to strive."

[2] This assumes that forest owners can't capitalize any of the benefits derived from such regulations, e.g., forest certification.

[3] Ireland is the exception. Most of the land had probably been forested at some time in history, but not in the memory of most of contemporary Irish society. In some cases, citizens protested afforestation as destroying their heritage of customary land uses.

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