



**OLD GROWTH**  
**in a NEW WORLD**

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*A Pacific Northwest Icon Reexamined*

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**Edited by Thomas A. Spies and Sally L. Duncan**

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*Unexplored Potential  
of Northwest Forests*

BETTINA VON HAGEN

The Northwest Forest Plan did not solve the dilemma of how to manage our extraordinary forest resource; it simply shifted the debate. Of course, the continuing distrust and friction between much of the environmental and forest industry communities and between rural and urban residents have serious implications for the region's citizens' ability to forge coherent, productive, long-term strategies for forest management. Distrust and friction also relate directly to broader societal concerns such as education, land use, and economic development. Conflicts over harvesting after fire on federal lands, the appropriate management of state lands, regulation of private forest lands, and other forest management issues continue to polarize us and have left bitter, unresolved legacies.

Underlying arguments about forests, of course, are deeper divides. The appropriate management of forests is a proxy for bigger rifts and social equity issues, such as the loss of political and economic power of rural communities to an increasingly urbanized population, or the ethic of those who work and live off the land versus those for whom it serves as a recreational amenity. Issues of class, economic opportunity, relationship to the land, legacy, and equity are at the heart of our debates. Ultimately, our forest management solutions, if they are to endure and build true value, must address these underlying tensions.

The irony in this conflict is that in the productive forests of the Pacific Northwest, it is not necessary to choose between fiber production and public values. To the contrary, this region is particularly well suited for a forest management approach in which sawlogs, pulp, jobs, carbon storage, flood control, habitat, scenic vistas, and recreational opportunities can all be produced from the same acres. Although many nonindustrial, state and municipal, tribal, conservation, community, and industrial forest landowners practice this approach, this ecosystem-based forestry approach constitutes the missing voice in the forest management debate.

### Effects of the Northwest Forest Plan

Few of the world's temperate forested regions have witnessed such protracted and acrimonious debate about their future and management as the Pacific Northwest. The Northwest Forest Plan (see box 2.1) successfully addressed the immediate issue of logging old-growth forests on public land, but it also generated sharply bifurcated management strategies on federal forests (emphasis on biodiversity) and private forests (emphasis on fiber maximization). It also failed to address some key realities.

First, the plan created late-successional reserves that could not provide all the public goods required. Second—and most importantly—it did not address the role that private lands could play in contributing to public values such as recreation, scenic vistas, carbon storage, habitat, and clean water, all while producing timber. By creating no incentives for forest management on private lands to enhance public values and by allocating insufficient resources for public lands to provide these, the plan took a limited view of the goods and services we desire from our forest landscape and thus spawned continuing controversy and debate.

Fortunately, there is a new market emerging that provides another opportunity for private forest landowners to implement a different approach to forest management, focusing not only on timber production but also on the enhancement of public goods. Ecosystem service markets provide an opportunity to achieve environmental goals through private instruments, such as the use of carbon credits to reduce greenhouse gas emissions (box 25.1). The advent of new incentives for conservation is particularly timely, because private forest land is rapidly changing hands in the Pacific Northwest and elsewhere, with about half of the land previously held by integrated forest product companies now owned by financial funds. Many fear this may lead to greater management intensity and forest fragmentation.

BOX 25.1. A SAMPLING OF ECOSYSTEM SERVICE AND CONSERVATION  
FINANCE MARKETS RELEVANT TO FORESTS

*Bettina von Hagen*

- *Carbon credit* trading provides a market mechanism to meet greenhouse gas reduction targets by trading permits to emit carbon dioxide and other greenhouse gases. It is one way that countries, industry, and other regulated entities can meet their reduction obligations under the Kyoto Protocol and other regulatory and voluntary schemes. In addition to trading among regulated entities, emitters can invest in carbon sequestration strategies such as reforestation or forest management that sequesters additional carbon. While the United States is not a signatory to Kyoto, regional markets are emerging, such as the Regional Greenhouse Gas Initiative in the Northeast and the Western Climate Initiative, that are setting regional caps and establishing trading systems.
- *Conservation banks* are permanently protected privately or publicly owned lands that are managed for endangered, threatened, and other at-risk species. In exchange for permanently protecting the bank lands and managing them for listed and other at-risk species, conservation bank owners may sell credits to developers or others who need to compensate for the environmental impacts of their projects. Conservation banks are widely used in California and are in early development in other states. Forest applications to date include development of conservation banks for red-cockaded woodpeckers.
- A *wetland bank* is a mechanism for compensating for unavoidable impacts to aquatic resources permitted under Section 404 of the Clean Water Act by creating, restoring, or enhancing wetlands, streams, or other aquatic resources. Wetland banks can lead to larger and more ecologically beneficial wetlands than on-site mitigation while also reducing planning and management costs.
- *Water quality trading* is a market approach to meeting water quality goals mandated by the Clean Water Act. Under this approach, one source can meet its regulatory obligations by using pollutant reductions created by another source that has lower pollution control costs. Traded "pollutants" include nitrogen, phosphorus, sediment, and temperature. Tree planting has played a large role in systems requiring temperature reduction.
- *Conservation easements* are voluntary, legally binding agreements between a landowner and a land trust or government agency that permanently limit uses of the land to protect its conservation values. In the most typical case, a forest landowner permanently forsakes development rights, although working forest easements that restrict or define specific forest management activities or outcomes are becoming more common. Easements may be donated

or sold, generally to public agencies. In 2006, the federal tax deduction provisions were significantly expanded.

- *Transferable development rights* allow landowners to purchase and sell residential development rights from lands that provide a public benefit. Such lands include forests, as well as farms, open space, and important habitat. Landowners receive financial compensation to forego development, and the public receives permanent preservation of the land. Transferred development, rights can be used to build additional houses on other parcels in more appropriate areas.
- *New Market Tax Credits* were created and authorized by the U.S. Department of the Treasury to stimulate investment in communities suffering from poverty and unemployment. Community development entities compete for a New Market Tax Credit allocation annually and are awarded an allocation based on their experience, capacity, and programs to stimulate investment and jobs in needy communities. An allocation gives the community development entity the capacity to sell a tax credit equal to thirty-nine percent of the qualified investment to a buyer, usually a financial institution, that can apply the credit to their federal tax burden.

Although the Northwest Forest Plan was successful in many ways, it also had some less-positive impacts, including lower timber harvests, fewer jobs than anticipated, perverse incentives, and unforeseen consequences. First, most of the burden for endangered species recovery fell on federal lands, setting up sharply different forest management approaches on federal and private lands. With the decline of timber harvests and revenue generation on federal forests, annual budgets fell as well. Funding declined for much-needed thinning of overstocked stands on federal forests. Some environmental groups continued to suspect that federal forest thinning sales were veiled attempts to cut more big trees and so challenged timber sales under the new program. Coupled with reduced management staff and resources, timber production from federal forests has been considerably lower than even the plan's sharply reduced targets foresaw.

Timber production shifted to the younger forests on private lands, and many of the mills tooled for the larger logs previously produced by federal forests closed. These events, coupled with the rise of engineered wood and the collapse of Asian markets, which had paid a premium for large logs, accelerated the transition to lower rotation ages and a smaller number of very large, highly automated mills, mostly located on transportation corridors away from traditional forest communities. As transportation distances



to the few remaining mills capable of sawing larger logs have increased, the former premium paid for large logs has become a penalty. Many private forest landowners, some of whom might otherwise consider managing for longer rotations, have chosen to shorten rotations to reduce the risk of lower prices.

Daunted by the scope and breadth of the plan's impact on federal forest management and an increasingly urbanized population in the region with a hunger for forest amenities, private forest landowners also anticipate increasing regulation of private forest land. In response, many of them are wary of managing forests to attract endangered species, create recreational opportunities, or develop scenic vistas, for fear that these public interests will trump their ability to manage in accordance with their own private interests. This fear—perhaps exaggerated by some—has, along with many other regional and global factors, accelerated the transition to more-intensive, fiber-maximizing management on private lands.

We now have two highly differentiated forest management strategies: (i) federal forests managed for public values, albeit with few resources, and (ii) private forests managed intensively for fiber production. The latter seek to intensify further to compete with the fast-growing plantations and highly automated lumber processing of Chile, Brazil, New Zealand, and soon, China.

Management of state-owned forests in Oregon and Washington generally follows a middle course, producing timber and nontimber products and services, but is subject to continuing pressure from the timber industry and counties dependent on timber revenues to accelerate the cut—and from environmentalists to reduce it. In pursuing the sharply divided strategies of intensive production on private lands and biodiversity on federal lands, we have reinforced old, unproductive stereotypes: conservation versus development, environment versus jobs, timber production versus biodiversity protection, consumption versus conservation, and urban versus rural—false choices that undermine the creation of long-term societal value.

### An Alternative Approach: Coproduction of Timber and Ecosystem Services

At Ecotrust—a regional conservation organization based in Portland, Oregon—we look for “triple-bottom-line” approaches, meaning that development and conservation strategies must (i) be financially viable, (ii) contribute to healthy and intact landscapes, and (iii) help build vibrant

communities. We believe that all economic activity can and should meet this triple-bottom-line test, from managing forests and farms, constructing buildings, and transportation systems to manufacturing widgets. We do believe in the value of preservation—of protecting viable, representative areas of significant ecosystems, such as old-growth forests. In some cases, protection is the best triple-bottom-line option.

However, in the face of growing population and increased resource demands, protection strategies are insufficient to maintain ecosystem health over the long term and are often prohibitively expensive. How we manage the land from which we derive our food, fuel, and fiber—the commodity production lands—is ultimately much more critical to our long-term prosperity.

Moreover, there are few better places to test this approach than in the Pacific Northwest's productive, lush, and forgiving forest landscape. Unlike many timber-producing countries, such as South Africa, New Zealand, or Brazil, that rely on exotic plantations, our native species are highly desirable commercial species. Unlike most tropical forests, our native tree species diversity is fairly low, simplifying management and commercialization. Our land tenure is secure; our forest products industry—logging, processing, distributing—is efficient; our population is relatively small and prosperous. Our trees tend to grow tall, straight, and old, often not reaching the culmination of mean annual increment until seventy or eighty years or even beyond that with appropriate thinning (Curtis, 1997). Given this, and the persistence of snags, downed logs, and belowground biomass, our forests store more carbon than just about any other terrestrial ecosystem (Smithwick et al., 2002). Equally important, our forests have salmon. Commercially valuable, elusive, iconic, beautiful, and culturally significant, salmon capture nutrients from the ocean and deliver them to our forests' doorstep, enriching forest health and sustaining hundreds of plant and animal species (Cederholm et al., 2000).

Why not manage for all of these values, not just on a fraction of the landscape, but as a dominant forest management strategy? Why not explicitly manage for logs; for pulp; for biomass; for carbon; for habitat; for fish; for clean, cold water; for recreational opportunities; for scenic vistas on all of our private lands? Why not manage for older forests with the structure, diversity, and productivity to deliver not only timber but a broad array of nontimber products and ecosystem services?

At this point, one might reasonably ask, If such an approach is financially feasible, why hasn't it become the dominant management paradigm? Doesn't managing for values other than timber sharply decrease timber

harvests, profits, and jobs? This seems reasonable but is only partly true and is mostly wrong. Many modelers and researchers have tackled the question of the relative financial, ecological, and social performance of different management strategies, with rotation length being a key variable and often serving as a proxy for habitat quality and structure. The findings suggest that managing forests for structure and diversity, or ecological forestry, results in (i) almost as much wood (or, in some simulations, as much wood) as industrial forestry; (ii) more valuable timber, due to both longer rotations and thinning for log quality; (iii) more jobs, given that thinning is labor-intensive and requires more frequent entries than industrial forest practices; and (iv) improved ecological outcomes. There is, however, considerable variability in the projected financial performance of long-rotation forestry, with results varying greatly depending on the rotation ages that are selected, the modeling assumptions, and the discount rate that is used.

One intriguing comparative study was conducted by Dr. Andrew Carey and his colleagues, who modeled three divergent forest landscape management strategies over a 300-year period in a Pacific Northwest coastal hemlock forest (Carey et al., 1999). The study concluded that the biodiversity pathway approach produced eighty-two percent of the net present value (the sum of the discounted net cash flows at the present time) of the industrial approach (a net present value of fifty-eight million dollars vs. the industrial approach's seventy million dollars) while achieving ninety-eight percent of the potential ecosystem health of unmanaged forests and also produced a larger variety and higher quality of wood products than the industrial approach. In a different study, Haynes (2005) found much larger differences in net present value. Not surprisingly, the "no-touch" approach generated no revenue; surprisingly, it failed to deliver even close to the level of ecological benefits provided by the biodiversity pathway approach. This illustrates that previously clearcut forests often benefit from active management to more quickly develop older forest characteristics.

Ecotrust's modeling generally confirmed Carey's (Carey et al., 1999) conclusions, although we found a larger difference in net present value between the industrial and ecological approach—thirty percent versus the eighteen percent difference noted by Carey, which we attributed to changes in prices for logs and pulp since Carey's study. In other words, a forest managed under the ecological regime produces more wood, more jobs, and more cash over time, but the harvests come later as rotation age is extended. Given the time value of money, distant cash flows are worth less than those closer in time, so the net present value is thirty percent lower (on average) for ecological forestry than for industrial forestry.

This was a tremendously exciting affirmation: If timber managed under ecological forestry could produce seventy percent of the industrial value, then the other forest products and services, such as carbon, biodiversity, and scenic values, which increase significantly under ecological management, could produce the other thirty percent of net present value to make up the difference. *This would allow ecological forestry to be fully competitive with industrial forestry from a financial investment perspective.* Given the recent rapid escalation of ecosystem service markets, such as carbon credits, conservation and wetland banking, and water quality trading, as well as longer-standing markets for conservation easements, we see expanding opportunities to monetize and transact in these other forest products and services (box 25.1). With a regional cap and trade market for carbon a virtual certainty in the next five years, along with the rapid growth of interest in socially responsible investing—now a \$2.3 trillion market—we see an opportunity to develop more compelling forest land management and investment options.

There were other timely reasons to design and offer an alternative forest management fund: (i) poor returns in the stock market in the first few years of the twenty-first century were causing investors to seek alternative asset classes; (ii) increased recognition of the value of forest land investments as a hedge against inflation and as a portfolio diversification strategy; and (iii) as discussed below, a considerable increase in the amount of timberland changing hands, creating an opportunity for new forms of ownership and new entrants.

The region's integrated forest product companies, such as Boise Cascade, Crown Pacific, and Longview Fiber, have sold or are divesting of their forest lands either voluntarily or through unsolicited hostile takeover bids. The result is a rapid change of ownership from integrated companies to ownership of forest land by financial funds. Driven by tax considerations, excessive debt, the lackluster performance of forestry companies in the stock market, and an increase in financial capital seeking alternative investments, this transition has created a new class of forest land ownership. These new owners value forest land strictly for its financial characteristics—strong historical financial returns at relatively low risk, a hedge against inflation, and diversification from other portfolio assets—and often have weaker ties to forest communities than the integrated forest product companies they replaced.

Although the growing presence of *timber investment management organizations (TIMOs)* presents new risks, it also presents some new opportunities. Forest land is coming to market at an unprecedented rate,

offering buying opportunities not only for traditional TIMOs but also for new classes of owners with genuine conservation, community, and tribal interests.

### Ecotrust Forests LLC: Seeking Triple-Bottom-Line Returns

In 2004, Ecotrust created Ecotrust Forests LLC (the fund) to give investors an opportunity to own forests managed for the triple bottom line—competitive financial returns, improved forest health, and job generation in rural communities—using the TIMO structure as a template. Although we readily adopted the organizational structure of a TIMO, we had more difficulty assuming some of its other structural elements. TIMOs typically create funds with a ten- to fifteen-year life; capital is raised and placed into forest investments, and then the portfolio is liquidated (meaning the forest land is sold) at the end of the designated time period. This structure is fundamentally inconsistent with our management objectives, which are to

- Purchase industrial forest land and manage it for greater structural complexity, diversity, and long-term productivity
- Provide competitive returns for our investors through the production of high-quality timber and pulp and the monetization of ecosystem services such as carbon storage, habitat, and water quality (box 25.1)
- Concentrate land acquisitions in high-priority watersheds where our management can benefit salmonids and other species of interest
- Attempt to influence the entire watershed by colocating with other landowners that share our management objectives
- Create long-term relationships with local communities and contractors, providing a reliable stream of jobs and opportunities
- Expand the knowledge, understanding, and practice of managing commercial forests for the triple bottom line.

Our objectives demand a long-term—in essence, perpetual—ownership. Buying a young forest and building up the volume of high-quality trees and habitat takes time and serves no purpose if the property is to be sold after fifteen years, other than creating a forest with a high liquidation value. We considered reselling the property subject to a conservation easement that perpetuated our forest management but rejected this approach due to the limited funding of conservation easements in the western United

States, the paucity of conservation buyers, and the impossibility of creating the long-term relationships fundamental to community partnerships and research and monitoring efforts.

## Outcomes of Long-Term Management

The result is a rather unusual and ambitious fund structure: Ecotrust Forests LLC continuously raises capital, purchases forest land, and manages those forests in perpetuity. Financial returns are generated through timber harvests and sales of nontimber forest products as well as ecosystem services. Exit opportunities are initially limited to private sales of membership interests to other qualified investors and to a limited buyback program of membership interests that starts in the tenth year. As the fund grows, we may consider changing the organizational structure from a limited liability company to a private or public real estate investment trust to improve liquidity opportunities for investors. Although timber revenues in the first two decades are generally lower than they would be under industrial management, nontimber revenues, including carbon credits, conservation easements, and New Market Tax Credits, are pursued in the first five years of ownership, providing a significant and early cash return to investors that can, in some cases, more than compensate for the delayed receipt of timber revenues.

As of October 2007, the fund managed 12,000 acres in four properties in coastal Oregon and Washington and had twenty-five investors, five of whom increased their capital contribution in the previous year. The fund is small but well poised for growth and enjoys considerable interest from potential investors. Investors can now see firsthand how the forest looks and responds to variable-density thinning (fig. 25.1) and how an aggressive focus on removing fish passage barriers improves access for salmon and overall habitat quality. We are also exploring and demonstrating the potential of alternative revenue streams; have successfully enhanced timber returns with conservation easements, sale of New Market Tax Credits, and special forest products (primarily leases for harvest of salal, used in the floral green trade, and salvaging old cedar stumps for production of shakes and shingles); and are structuring forest carbon projects for the voluntary carbon market (fig. 25.2).

Although these are early days, we have gained valuable insights from pursuing about a dozen acquisitions and successfully acquiring four properties, developing and implementing management plans, and seeking ecosystem service transactions. Some of the early lessons include



FIGURE 25.1. Dickey River postharvest, 2005. Aerial view of variable-density thinning and patch cuts. This approach to forest management enhances carbon stocks and biodiversity, which can be monetized to produce new revenue opportunities for forest landowners.

- The fund is most competitive in buying younger properties, because mature properties are priced at liquidation value, which favors buyers with aggressive logging plans. Younger properties also provide the opportunity to improve structure and diversity early in the stand's life by thinning.
- Ecological forestry is more sensitive to log and pulp prices than industrial forestry is. Thinning is more expensive than clearcutting on a volume basis (dollars per million board feet); the result is smaller net margins and potentially less profit if prices drop or if steep slopes or other factors (for example, distance from roads) increase costs. On the other hand, because the fund is not leveraged and fixed expenses are low, thinning and management expenses can be timed to match well-priced markets. In addition, because the fund has access to nontimber markets for ecosystem services, it can pursue these other revenue streams when log and pulp prices are low.

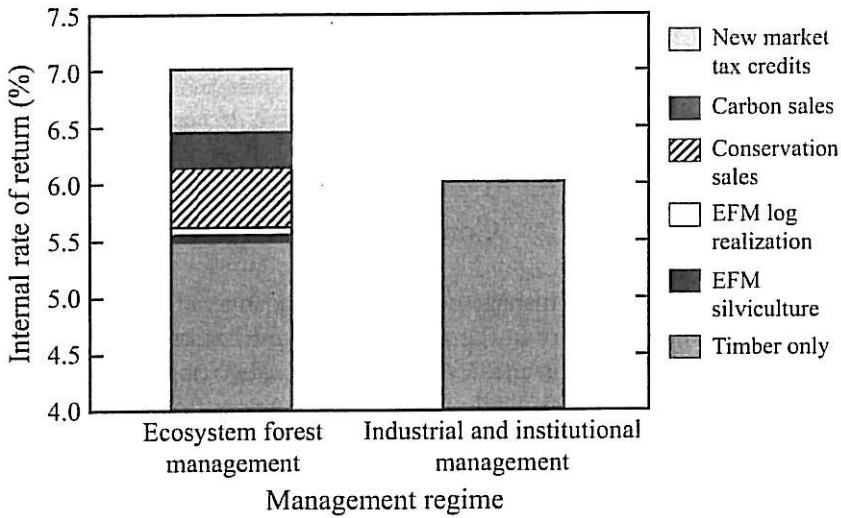


FIGURE 25.2. Although ecosystem-based forest management yields a lower internal rate of return when only timber harvests are considered, the sale of ecosystem services can enhance returns above those that are obtained by industrial forestry. (Binkley et al., 2006)

- Most growth and yield models and forest management systems are designed for the predominant industrial approach of clearcutting, site preparation, and planting. Finding modeling and management tools that adequately project growth and natural regeneration following thinning and small patch cuts is very challenging and reflects a significant underinvestment by the research community in forest management approaches that differ from the industrial model.
- Early evidence suggests that our commitment to long-term ownership, an explicit focus on producing jobs and opportunities for local communities, and a broader set of management activities produces more jobs and more-reliable employment than current industrial practices.
- Ecosystem service markets are a viable strategy for enhancing returns from timber and making ecological forestry fully competitive with the industrial model. The interest and opportunities in both carbon credit and water quality trading markets have increased significantly since the fund was formed (von Hagen and Burnett, 2006). Particularly significant has been the sale of New Market Tax Credits—not



technically an ecosystem service market but still a financial incentive from the public sector that provides financial incentives for enhancing the public good.

## Conclusion

The bifurcation of forest management between endangered species protection and intensive forestry in the Pacific Northwest has exacerbated false choices about conservation and development. These two opposing pursuits ignore an approach that explicitly seeks financial returns from both timber production and the enhancement of public values, such as carbon storage, water quality, and scenic vistas. This approach produces high-quality timber and a vast array of nontimber forest products and services and plays to the competitive strengths of the Pacific Northwest, where trees grow old while remaining productive and residents value the “second paycheck” that environmental services and amenities provide. Ecological forest management augments species recovery efforts on federal forests by enhancing forest diversity and structure on private lands and is likely to create more resilient forests that are better positioned to survive the looming changes in global markets and climate.

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