The Northwest Forest Plan as a Model for Broad-Scale Ecosystem Management: a Social Perspective

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Abstract: *I evaluated the Northwest Forest Plan as a model for ecosystem management to achieve social and economic goals in communities located around federal forests in the U.S. Pacific Northwest. My assessment is based on the results of socioeconomic monitoring conducted to evaluate progress in achieving the plan's goals during its first 10 years. The assessment criteria I used related to economic development and social justice. The Northwest Forest Plan incorporated economic development and social justice goals in its design. Socioeconomic monitoring results indicate that plan implementation to achieve those goals met with mixed success, however. I hypothesize there are two important reasons the plan's socioeconomic goals were not fully met: some of the key assumptions underlying the implementation strategies were flawed and agency institutional capacity to achieve the goals was limited. To improve broad-scale ecosystem management in the future, decision makers should ensure that natural-resource management policies are socially acceptable; land-management agencies have the institutional capacity to achieve their management goals; and social and economic management goals (and the strategies for implementing them) are based on accurate assumptions about the relations between the resources being managed and well-being in local communities. One of the difficulties of incorporating economic development and social justice goals in conservation initiatives is finding ways to link conservation behavior and development activities. From a social perspective, the Northwest Forest Plan as a model for ecosystem management is perhaps most valuable in its attempt to link the biophysical and socioeconomic goals of forest management by creating high-quality jobs for residents of forest communities in forest stewardship and ecosystem management work, thereby contributing to conservation.*

Key Words: conservation and development, forest management, rural communities, socioeconomic monitoring

El Plan Forestal del Noroeste como un Modelos para la Gestión de Ecosistemas a Gran Escala

Resumen: *Evalué el Plan Forestal del Noroeste como un modelo para la gestión de ecosistemas para alcanzar metas sociales y económicas en comunidades localizadas alrededor de bosques federales en el Pacífico Noroeste de E.U.A. Mi evaluación se basa en los resultados del monitoreo socioeconómico desarrollado para evaluar el progreso en el logro de las metas del plan durantes sus 10 primeros años. Los criterios de evaluación que utilicé se relacionan con el desarrollo económico y la justicia social. El diseño del Plan Forestal del Noroeste incorporó metas de desarrollo económico y de justicia social. Sin embargo, los resultados del monitoreo socioeconómico indican que éxito en la implementación del plan para alcanzar esas metas fue combinado. Postulé la hipótesis de que hay dos razones importantes por las que las metas socioeconómicas del plan no se cumplieron totalmente: algunas de las suposiciones clave en las estrategias de implementación fueron deficientes y la capacidad institucional de la agencia para alcanzar las metas era limitada. Para mejorar la gestión de ecosistemas a gran escala en el futuro, los tomadores de decisiones deberán asegurarse que las políticas de gestión de recursos naturales sean aceptables socialmente; que las agencias de gestión de tierras tengan la capacidad institucional para cumplir sus metas de gestión; y que las metas de gestión sociales y económicas (y las estrategias para su implementación) se basen en suposiciones precisas de las relaciones entre los recursos a gestionar y el bienestar de las comunidades locales. La manera de vincular*

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comportamiento de conservación y actividades de desarrollo es una de las dificultades para la incorporación de metas de desarrollo económico y de justicia social en las iniciativas de conservación. Desde una perspectiva social, el Plan Forestal del Noroeste como modelo para la gestión de ecosistemas quizás es más valioso por su intento de vincular las metas biofísicas y socioeconómicas de la gestión forestal mediante la creación de empleos de alta calidad para residentes de las comunidades en labores de regulación y supervisión forestal y de gestión de ecosistemas, por lo tanto contribuye a la conservación.

Palabras Clave: conservación y desarrollo, comunidades rurales, gestión forestal, monitoreo socioeconómico

Introduction

The Northwest Forest Plan was an attempt to respond to two concerns that prevailed in the Pacific Northwest in the early 1990s: the protection of older forest ecosystems and the protection of rural communities and economies. I assessed the plan as a model of ecosystem management from a social perspective, examining its design and implementation. I based my assessment on the results of monitoring conducted during 2003 and 2004 for the purpose of evaluating the plan's progress in achieving its social and economic goals during its first 10 years.

Finding good models for broad-scale approaches to ecosystem management is important because such approaches have emerged as a leading strategy for conservation. And, although the issue is still debated, many conservation professionals have concluded that biodiversity conservation strategies are more likely to succeed if they consider the triple objectives of conservation, development, and social justice (Brechin et al. 2003; McShane & Wells 2004; Borgerhoff Mulder & Coppolillo 2005). Therefore, I used criteria related to economic development and social justice to assess the Northwest Forest Plan, and I explored its shortcomings in an effort to identify lessons learned for future efforts at broad-scale ecosystem management.

Background

Lands managed by the U.S. Department of Agriculture Forest Service (USFS) and the U.S. Department of the Interior Bureau of Land Management (BLM) have multiple-use mandates. They should not be confused with national park lands, where natural and cultural resources and values are meant to be preserved unimpaired. The USFS and BLM lands are managed to conserve biodiversity and ecosystem processes, while providing for commodity production, recreation, ecosystem services, and other uses. The question for forest management as applied to USFS and BLM lands is not whether or not use of natural resources should be allowed, but which activities should occur where, to what extent, and how. Furthermore, although the USFS and BLM are land-management agencies rather than rural development agencies, they have historically assumed a role in contributing to community development by providing employment opportunities, commodities, and economic action programs to rural communities and by revenue sharing with local governments.

When the Northwest Forest Plan was developed in the early 1990s, ecosystem management was emerging as the leading paradigm for federal forest management (sustained-yield timber production preceded it). The purpose of ecosystem management is to sustain ecological integrity by maintaining viable populations of native species, native ecosystem types, and evolutionary and ecological processes over long time horizons, accommodating human use and occupancy within these constraints (Grumbine 1994). The Northwest Forest Plan initially focused on species conservation, consistent with this approach. The final plan was a political compromise, however, that included social and economic goals in the hope of breaking the gridlock over timber harvesting on federal forests that led to its development.

The plan's social and economic goals reflected understandings that prevailed at the time about the role of federal forests in the regional economy of the Pacific Northwest and the relationship between federal timber production and community well-being. The prevailing view was one of commodity-based development rooted in economic base theory (Harris et al. 2003). According to this model, commercially valuable commodities produced locally form an economic base for a community, and economic growth there is driven by external demand for these commodities. Thus logging, processing, and manufacturing produce wood and wood products for export, bringing new income into a community or region with positive economic effects. The base industry attracts other firms that provide services to the industry and its employees, again contributing to economic development.

The wood-products industry was a major economic sector in the Pacific Northwest from the 1950s through the 1980s and was considered the economic base for many rural communities around federal forests. The National Forest Management Act defined "timber dependent communities" as those having 10% or more of total employment in the wood-products industry. On average,

employment in the timber industry accounted for 9.5% of total employment in the Northwest Forest Plan area between 1970 and 1974 and 5.1% of total employment between 1985 and 1989 (FEMAT 1993). These regional figures mask subregional and local differences, however, that prevailed outside major metropolitan areas. For example, between 1970 and 1974 timber employment accounted for 31.2% of total employment in the California portion of the plan area, 30.8% of total employment in southwestern Oregon, and 19.8% of total employment on the Olympic Peninsula of Washington. These figures dropped to 15.3%, 13.3%, and 10.3% of total employment in these subregions, respectively, by 1985–1989 (FEMAT 1993).

The employment decline partly reflected economic diversification in the region between the two periods caused by growth in nonmanufacturing sectors (USDA Forest Service & BLM 1994*a*). It also reflected a drop in timber-industry employment between the two periods (Fig. 1). Many variables contributed to this drop, including mechanization within the industry, the transfer of capital investment away from the region, the closure of less efficient mills, economic recession, and weak demand for wood products (Goodstein 1999; Power 2006 [this issue]). Nevertheless, people believed that if federal agencies and private timberland owners produced stable, even flows of timber, community stability would be maintained (Richardson 1996). Between 1965 and 1989 USFS and BLM lands in the Oregon and Washington portions of the plan area contributed 36% of the total annual average timber harvest in these states (Phillips 2006*a*). Any reduction in federal timber harvesting therefore implied a threat to social and economic stability in timber-dependent communities. The agencies projected that the plan would cause the loss of some 25,000 jobs in the timber industry, or 17% of total timber-industry employment in the plan area (FEMAT 1993).

Northwest Forest Plan: Assumptions and Design

President Clinton charged the developers of the Northwest Forest Plan with devising a "balanced and comprehensive strategy for the conservation and management of forest ecosystems, while maximizing economic and social benefits from forests" (USDA Forest Service & BLM 1994*a*). Specifically, four goals of the plan had economic development or social justice objectives: (1) produce a predictable and sustainable level of timber sales and nontimber resources, (2) maintain the stability of local and regional economies on a predictable, long-term basis, (3) assist with long-term economic development and diversification to minimize adverse impacts associated with job loss in areas where timber sales cannot proceed (USDA Forest Service & BLM 1994*b*), and (4) promote interagency collaboration and agency and citizen collaboration in forest management (Tuchmann et al. 1996). To meet these goals, the plan contained a number of strategies, each based on a set of assumptions.

The 1990 listing of the Northern Spotted Owl (*Strix occidentalis caurina*) as threatened under the U.S. Endangered Species Act, followed by a series of lawsuits and injunctions on federal timber sales within the owl's range, caused the volume of timber sold from USFS and BLM lands to drop substantially around 1991 (Fig. 2). It was assumed that the plan would resume the flow of timber and enable the agencies to produce a stable, although reduced volume of timber sales. The plan established a probable sale quantity (PSQ) timber estimate to meet this goal (an estimate of the average annual volume of timber sales likely to be achieved over a decade). It was assumed that producing predictable levels of timber and nontimber resources would help maintain community stability around federal forests.

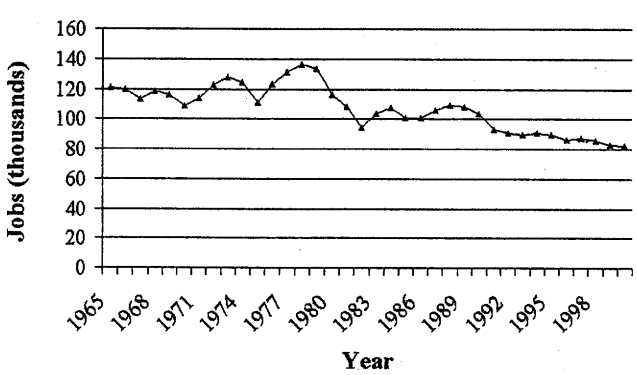

Figure 1. Employment in lumber and wood products in Oregon and Washington, 1965–2000 (data from Phillips 2006a, used with permission).

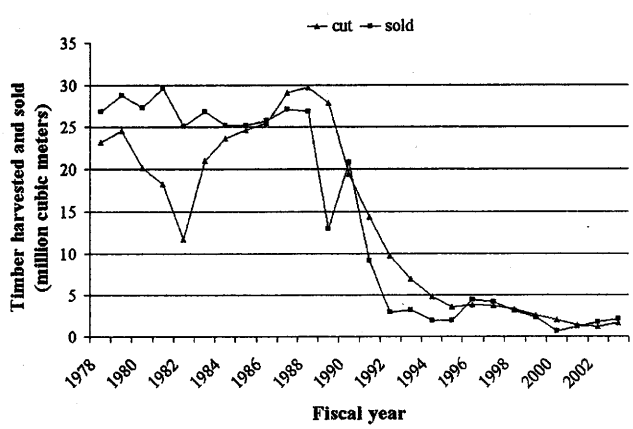

Figure 2. Volume of timber harvested and sold in national forests covered by the Northwest Forest Plan, 1978–2002 (from Charnley 2006b, used with permission).

The agencies also recognized that many communities could be severely affected by cutbacks in federal timber harvesting. New work in restoration, research, surveys, assessments, and monitoring associated with ecosystem management was expected to help offset job loss in the forestry services and timber sectors. The Northwest Economic Adjustment Initiative provided $1.2 billion over 5 years to mitigate the effects of the plan on people, communities, and businesses that were economically dependent on the wood-products industry and to provide for a period of economic transition in these communities (Tuchmann et al. 1996). Social justice concerns were addressed by targeting economic assistance to those who bore the greatest costs of the plan's conservation measures. It was assumed that the initiative would provide immediate relief to distressed timber communities and create an environment conducive to long-term community economic development.

Mitigation measures to address the problem of declining timber receipts under the plan were also implemented. Historically, 25% of gross timber receipts from the sale of USFS timber and 50% of timber receipts from the sale of BLM timber in western Oregon were paid to county governments to compensate them for tax revenues foregone because federal forest lands are not in private ownership (Phillips 2006*b*). Congress passed legislation in 1993 to offset the effects of declining timber revenues to county governments through a period of transition. It was replaced by national legislation in 2000 designed to stabilize payments to county governments.

The plan also created new institutions to promote agency and citizen collaboration in forest management, again addressing social justice objectives. The 10 adaptive management areas established through the plan were places where forest managers and communities were to collaborate in developing and testing innovative local approaches to forest management that integrated ecological, social, and economic objectives, with community members as full participants in ecosystem management (USDA Forest Service & BLM 1994*b*). In addition, 12 provincial advisory committees with representatives from different stakeholder groups were established as a forum for information exchange and discussion and to provide input for amending forest plans (Donoghue et al. 2006). It was assumed that new forms of collaboration would increase public involvement in forest management, lead to innovative forest-management practices, and reduce conflict.

Northwest Forest Plan: Implementation and Results

From a conceptual and design standpoint, the Northwest Forest Plan addressed several economic development and social justice concerns. A socioeconomic effectiveness monitoring program was established in late 2002 (after two pilot efforts) as part of the Pacific Northwest Interagency Regional Monitoring Program to assess progress in meeting the plan's socioeconomic goals during the first decade. A team of 11 social scientists conducted the monitoring work, and their findings are published in Charnley (2006*a*). Because the agencies established the program late in the decade, the team had to rely largely on existing quantitative data not gathered for the explicit purpose of socioeconomic monitoring. The team was able to collect qualitative data, however, from four forests and 12 communities associated with those forests to examine the effects of the plan at the local level. Detailed descriptions of the monitoring methods are in Charnley (2006*a*). I summarize some of the key findings below to assess whether the plan, as implemented, serves as a good model for ecosystem management.

Goal 1: Produce a Predictable Level of Timber Sales and Nontimber Resources

The team monitored timber sales, special forest products, grazing, mining, and recreation, as specified by the Northwest Forest Plan Record of Decision (Charnley 2006*b*). The goal of producing a predictable level of timber sales was not met. The average PSQ volume produced between 1995 and 2003 was about 2.39 million m^3 (1000 board feet = 5.67 m^3) (R. W. Haynes, personal communication), or 54% of what was expected. In addition, grazing on USFS and BLM lands declined during the first decade of the plan, as did most categories of mining activity. Trends in harvest of special forest products were mixed and varied by species. Agency data for monitoring recreation opportunities were limited, but the available data indicate that trends in recreation opportunities on federal forests were also mixed, varying by activity and management agency. The BLM appears to have expanded recreation opportunities on the lands it manages, whereas the USFS had difficulty maintaining some of its recreation infrastructure. The role of the plan in influencing these trends varied by resource (Charnley 2006*b*).

Goal 2: Maintain the Stability of Local and Regional Economies

To evaluate this goal, the monitoring team examined available data on benefits from federal forests that contribute to the social and economic well-being of local communities. These benefits included jobs and income associated with timber production (no data were available for estimating change in jobs and income associated with grazing, mining, special forest products, and recreation),

agency jobs, procurement contracts for ecosystem management work, and payments to county governments. Other benefits from federal forests that contribute to the well-being of local communities include ecosystem services (such as clean air and water) and amenity values (such as scenic quality and wildlife). The team did not monitor this set of benefits because indicator data were not available at the required scale or because methods for quantifying and monitoring indicators of these values and services are poorly developed.

Between 1990 and 2000, about 30,000 direct jobs in the primary wood-products industries were lost in the Northwest Forest Plan area, representing a reduction of more than 25% compared with 1980s levels (Fig. 3) (Phillips 2006*a*). These numbers refer to primary processing jobs in standard industrial code categories 24 (solid-wood products manufacturing) and 26 (pulp and paper industries), which are closely tied to log supplies. These jobs are not expected to return. About 19,000 of these jobs were lost between 1990 and 1994, and the main cause was reduced timber supplies across ownerships. Roughly 11,400 of the lost jobs were attributed to cutbacks in federal harvests triggered by the listing of the Northern Spotted Owl and subsequent injunctions on timber sales (R. H. Phillips, personal communication). About 11,000 timber-industry jobs were lost in the plan area after 1994, despite an overall increase in log supply across ownerships. About 400 of these jobs were lost because of reduced harvesting on federal forests; the others were lost because of mill closures in response to previous supply declines, industry retooling to more efficiently process small-diameter logs, and continued investment in labor-saving technologies. Income followed these trends, with real total income declining between 1990 and 2000 in primary solid-wood products industries (17%) and in primary pulp and paper manufacturing (24%). These changes occurred within the context of an overall increase in total employment in the plan area of about 1.3 million jobs during the 1990s, the majority of which were in the trade and services sectors (Phillips 2006*a*).

The BLM lost 166 full-time equivalent positions (13% of the workforce) on its five western Oregon districts between 1993 and 2002 (Stuart 2006). During this same time period, the USFS lost 3066 full-time equivalent positions on its 17 plan-area units, or 36% of its workforce. These losses led the USFS to close or substantially downsize 23% of its field offices that had previously housed a forest supervisor or district ranger. The BLM did not close any field offices (Stuart 2006).

To evaluate the success of investments in creating local jobs tied to forest ecosystem management, Moseley (2006) examined trends in agency procurement contracting for ecosystem management work in the plan area between the early 1990s and the early 2000s. She found that the type of agency contract work shifted from intensive timber management to ecosystem management, as expected, but this shift occurred within the context of an overall decline in agency procurement contract spending (Fig. 4). BLM contract spending remained fairly constant during the period, averaging just under $20 million/year. In contrast, USFS contract spending declined from $103 million in 1991 to $33 million in 2002. The dwindling contract money that was available was not targeted to local communities that had experienced the greatest impacts from the plan.

Revenue-sharing data indicate that payments-to-counties legislation had a stabilizing effect on county governments, as intended, and that it mitigated county revenues lost from declines in federal timber harvest (Fig. 5) (Phillips 2006*b*). How it affected overall county financing, however, is unknown.

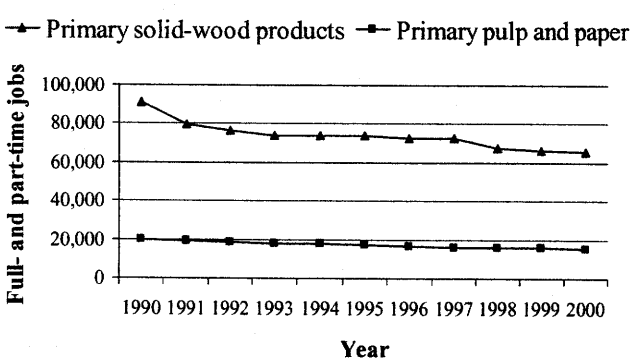

Figure 3. Timber industry employment in the area affected by the Northwest Forest Plan, 1990–2000 (from Phillips 2006a, used with permission).

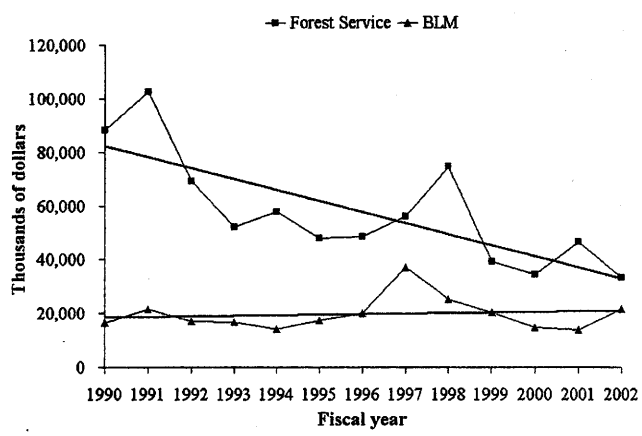

Figure 4. Total annual ecosystem management procurement in the Northwest Forest Plan area, Forest Service and Bureau of Land Management, 1990–2002 (from Moseley 2006, used with permission).

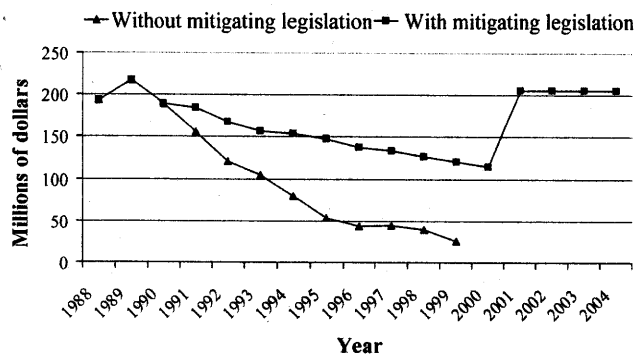

Figure 5. National forest payments to states in counties in the Northwest Forest Plan area (from Phillips 2006b).

Goal 3—Assist with Long-Term Economic Development and Diversification

The Northwest Economic Adjustment Initiative did little to help displaced timber workers and their families because the money that arrived was too little and too late to have much effect (FCR 2002; Dillingham 2006). More success was reported in the area of assistance to businesses, for example, a revolving loan fund that provided grants and loans to small businesses to promote expansion and diversification. Projects to improve community capacity (e.g., leadership development, community and business planning, technical assistance for grant writing) and community infrastructure (e.g., business parks, water and sewer systems, technology projects) helped communities become better positioned to take advantage of economic development opportunities. It is too soon to tell, however, whether many of these long-term economic development and diversification projects will be successful. The Jobs-in-the-Woods program, intended to provide displaced timber workers with jobs that produced ecological benefits, was somewhat successful, but it created few long-term employment opportunities. For the most part the initiative failed to create sustainable local jobs that were comparable to the number and quality of those lost to reductions in federal timber harvesting (FCR 2002; Dillingham 2006).

Goal 4—Promote Agency and Citizen Collaboration in Forest Management

Progress in meeting the Northwest Forest Plan goal of improved agency and citizen collaboration in forest management was mixed. Most of the adaptive management areas did not meet plan expectations for collaboration (Donoghue et al. 2006). Provincial advisory committees were more successful in creating collaboration through their multiparty discussions of forest-management issues. The committees do not appear to have played a strong role in decision making, however. Extensive agency and citizen collaboration was required in implementation of the Northwest Economic Adjustment Initiative, which strengthened relationships between the agencies and communities that received assistance.

Community Well-Being

Can plan implementation be linked to change in community well-being around federal forests? Donoghue and Sutton (2006) delineated 1314 nonmetropolitan communities in the 72 counties that constitute the Northwest Forest Plan area. Of these, 750 are within 8 km (5 miles) of a federal forest. More than 2 million people, or roughly one-fifth of the population of the region, lived in these 750 communities in 2000. Using a socioeconomic well-being measure developed from U.S. Census indicators, Donoghue and Sutton (2006) found that between 1990 and 2000 socioeconomic well-being increased in 37%, decreased in 40%, and showed little change in 23% of the communities within 8 km of a federal forest.

To understand how changes in community well-being might be linked to the plan, the monitoring team used a case-study approach. Four federal forests and three randomly selected communities around each forest served as the cases. The team interviewed 82 agency employees and 223 community members and asked them how plan implementation on the case forests had affected communities around those forests.

All the case-study communities monitored had experienced changes since the 1980s. Although timber was an important economic sector in all but one community during the 1970s and 1980s, it had become minor or negligible in all but one community by 2003. The effects of the plan on communities varied, depending on the relative strength of the timber sector in each community around 1990, the extent to which wood products harvested on federal forest lands supported that sector, and the degree to which local residents depended on USFS employment. The timber sector in some communities had been declining since the early 1980s. The Northwest Forest Plan added to this decline.

In 2003 the case-study communities were being sustained through a different mix of economic pursuits. Some had a substantial farming or ranching sector, some were near a major transportation corridor that provided commuting options or business opportunities, and some were close to a popular recreation and tourism destination, providing jobs in this sector. Other communities experienced an influx of retirees, commuters, mobile or self-employed workers, owners of second homes, immigrants, or low- and fixed-income populations. Some that had been goods and services centers expanded their role

as regional centers. And tribes, where present, played an important role in contributing to community development through the growth of tribal businesses, administration, and social and environmental services. Socioeconomic well-being scores increased for 2 of the 12 communities, decreased for 4, and showed little change for 6. It was not possible to identify correlations between community characteristics and change in well-being scores.

Discussion

Did the Northwest Forest Plan deliver on its socioeconomic goals during the first decade, and can it be considered a good model for ecosystem management as implemented? Although the plan as designed tried to address concerns relating to economic development and social justice, monitoring results point to mixed progress during the first decade. It is important to ask why, to identify lessons that can be learned for future broad-scale ecosystem management projects. The monitoring team's emphasis was monitoring rather than investigating the causes of the monitoring trends. Based on the monitoring work, however, I hypothesize that there are two important reasons the plan's socioeconomic goals were not fully met: (1) some of the key assumptions underlying the implementation strategies were flawed and (2) agency institutional capacity to achieve the goals was limited.

Levels of Timber and Nontimber Resources

Agency PSQ estimates for timber harvesting were based on a set of assumptions that contradicted prevailing public values about federal forest management in the Pacific Northwest. The agencies assumed that older forests would contribute about 90% of the harvest during the first three to five decades of the plan; that about 50% of the harvest in the first decade would come from forests more than 200 years old; and that the main harvest method would be regeneration harvest (Charnley 2006*b*). Regeneration harvesting is often done by clearcutting. A literature review of public values relating to forest management in the Pacific Northwest revealed that the majority of the region's residents surveyed favored protecting old growth and that clearcutting was unpopular (Charnley & Donoghue 2006). Consequently, one of the main reasons forest units did not produce the amount of timber expected was because of appeals and litigation over timber sales that included older trees.

Economic Stability and Economic Development

Many factors influence well-being in communities around federal forests. It is misleading to assume that the stability of local and regional economies in rural, forest-dependent communities depends on steady, even flows of timber. Predictable timber supplies may contribute to economic stability, but they do not ensure it. Thus, even if the agencies had succeeded in producing a steady timber supply consistent with PSQ estimates, it is unlikely they would have met their second goal, to maintain the stability of local and regional economies.

Moreover, understandings of the role of federal forests in the regional economy of the Pacific Northwest and the relationship between federal timber production and community well-being have changed since the 1980s. Well-being in forest-dependent communities was once thought to depend on the health of the wood-products industry, following the commodity-based model of economic development. In the 1990s some researchers argued instead for an amenity-based model of development (Power 1996; Goodstein 1999). According to this model, rural communities with desirable physical and social environments attract tourists, new residents, and businesses that stimulate economic development. The new residents may not depend on local jobs for their incomes, and the new businesses do not rely on extracting, processing, or manufacturing local natural resources (Harris et al. 2003). Federal lands play an important role in amenity migration because of the natural amenities they provide, such as open space, scenery, outdoor recreation opportunities, and environmental quality.

Rural western counties well endowed with amenity values have experienced high rates of inmigration since the 1970s. Quality-of-life values are more important than jobs in attracting migrants to these places (Rudzitis 1999). Migrants bring with them financial and human capital, and tourists, migrants, and new businesses create demand for additional jobs (especially in the services sector), stimulating local economic development, with jobs following people. The regional economy of the Pacific Northwest grew rather than declined during the 1990s, despite the Northwest Forest Plan, declining timber harvests, and timber-industry downsizing (Goodstein 1999; Niemi et al. 1999). And environmental protection measures such as wilderness designation have not negatively affected county-level population or employment growth in many amenity-rich counties (Duffy-Deno 1998; Rudzitis & Johnson 2000). These findings are cited as evidence for the amenity-based model of development.

The Northwest Forest Plan may have enhanced natural amenity values associated with federal forests. For example, the plan was expected to foster natural-looking landscapes and enhance some recreation opportunities. Older forest habitat, highly valued by many members of the public, has increased on federal lands (Moeur et al. 2005). And watershed condition has improved since plan implementation in more than half the watersheds monitored (Gallo et al. 2005), suggesting that the Aquatic Conservation Strategy may be enhancing natural amenities such as fish and clean water.

The extent to which local migration is affected by natural-resource policy that changes the natural amenity

values of specific locations is unknown, however (Garber-Yonts 2004). Although natural amenities (e.g., mountains, water bodies) are a strong force associated with migration to rural areas, they change relatively slowly over time. There has been little research into the effects of forest-management policies or local management practices on migration at the community level or into how the shift to ecosystem management and changes in recreation resources on federal forests have affected regional or county-level population growth (Garber-Yonts 2004). Nevertheless, some researchers argue that unlogged forests are more important for regional economic health than logged forests (Niemi et al. 1999).

Commodity production and environmental protection need not be mutually exclusive community-development strategies, however. Surveys of Pacific Northwest residents find consistent support for forest management to support a broad set of multiple uses and both economic and environmental benefits (Charnley & Donoghue 2006). Sustainable, multiple-use management may have the best economic outcome for local communities. For such strategies to be successful, however, agencies must have the capacity to carry them out.

The Northwest Forest Plan was complicated and costly to implement. The initial plan assessment warned that ecosystem management is not necessarily cheaper than traditional commodity production and that adoption of the plan should not be accompanied by reductions in funding and staffing (FEMAT 1993). The BLM unit budgets in the Northwest Forest Plan area rose 22% between 1993 and 2003, but USFS unit budgets dropped 35% during this period (Stuart 2006). The USFS budget declines were caused mainly by the decline in timber receipts; BLM budgets were not as dependent on timber. Declining USFS budgets meant the agency cut agency jobs, had less money to spend on procurement contracts, and reduced economic community-assistance programs to preplan levels. Many USFS units also struggled to accomplish basic forest management work and to maintain their infrastructure. In contrast, BLM units seemed able to invest in activities aligned with plan goals, such as habitat restoration, fish and wildlife projects, recreation and tourism development, and environmental education (McLain et al. 2006). The BLM also continues to fund Jobs-in-the-Woods.

Collaboration in Forest Management

Adaptive management areas in particular were to serve as testing grounds for integrating the ecological, economic, and social components of sustainable forest management. This effort largely failed. A key reason for this failure was a lack of agency institutional capacity, characterized by a shortage of staff time and financial resources, lack of training for skill development, lack of leadership, and lack of commitment to a new way of doing business (Stankey et al. 2003). There were exceptions, however. In some adaptive management areas, agencies and communities have collaborated to accomplish ecosystem management activities that have resulted in local job creation.

Conclusions

Sustainable forest management as currently conceptualized was not part of the discussion when the Northwest Forest Plan was developed. Today, sustainability has been identified as the overall goal of land management planning on USFS lands, with the social, economic, and ecological components of sustainability recognized as interdependent. The BLM also embraces this goal. People and communities can no longer be treated as "issues to receive mitigation" once scientists figure out how to manage for the biological values of forests (Salwasser 2005). To be a successful model for broad-scale ecosystem management by today's standards, a management plan should address the social, economic, and ecological components of sustainability. To date, however, few if any forest-management plans seem to have been successful in meeting this standard.

Although the Northwest Forest Plan was developed under a different land-management paradigm than currently exists, it did incorporate some important economic development and social justice goals in its design that were intended to contribute to sustainability in rural communities around federal forests. The plan made mixed progress in meeting those goals when implemented, however. Results of socioeconomic monitoring of the Northwest Forest Plan provide lessons that can be applied to improving broad-scale ecosystem management plans in the future.

First, even if natural-resource management policies are economically feasible and ecologically sound, they will fail if they are not socially acceptable (Bliss 2000; Stankey & Schindler 2006). In the context of management of federal forests in the Pacific Northwest, this observation implies taking a serious look at whether harvesting old growth should continue (Dombeck & Thomas 2003). Clearcutting on federal forests in the plan area has been halted for the most part in favor of partial removal techniques.

Second, land-management agencies must have the institutional capacity to implement their management goals. This capacity includes having staff with the required skills, financial resources, incentives, and the flexibility to undertake new ways of doing business. Further examination of the differential success of the BLM and the USFS in producing social and economic benefits under the plan could provide insight into this issue.

Third, social and economic management goals and strategies for implementing them should be based on accurate assumptions about the relations between the

management of forests (or other protected areas) and community well-being. For example, assumptions about community stability that underlay some of the plan's socioeconomic strategies were flawed (Power 2006). Both monitoring and research can be used to improve these assumptions.

Fourth, new understandings of the relations between forests and communities developed from monitoring and research indicate that these relations are diverse, but this diversity does not imply conflicting socioeconomic goals for forest-management policy. As communities around federal forests in the Pacific Northwest take advantage of changing opportunities to sustain themselves, they are exploring how the forests that surround them can continue to be a source of well-being. Some residents may simply want to enjoy the scenic quality, recreation opportunities, and environmental values that federal forests provide. Others for whom work has been one of the ways they and their families have related to forests in the past continue to want forest-based, family-wage jobs (Charnley & Donoghue 2006).

The health of local and regional economies is enhanced by diversity. Sustainable timber harvesting on federal lands can be one source of diversity. The consumption of wood products in the United States is increasing (Haynes 2003), and the wood-products industry still plays a role in the Pacific Northwest (Warren 2005). There is also a need for silvicultural activity to promote forest health. Forest ecosystems in parts of the Pacific Northwest are at risk of uncharacteristically severe wildland fires because of a century of fire suppression (Spies et al. 2006 [this issue]). Forests are also threatened by insects, disease, and invasive species. Although amenity-based migration may be a source of economic growth in many communities around forests, deteriorating forest conditions may undermine the amenity values that attract residents and visitors, and fire threatens communities expanding into the wildland-urban interface. Active forest management is widely regarded by residents of the Pacific Northwest as necessary to promote ecosystem health (Charnley & Donoghue 2006). Yet the USFS in particular has reduced institutional capacity to undertake active forest management for restoration and is increasingly relying on partnerships with external stakeholders to accomplish this work.

Work in forest restoration, and its by-products (e.g., small-diameter wood), can provide new employment opportunities in local communities and enhance the amenity values of forests. Thus, some critical questions for forest management today are, What are the new opportunities for creating forest-based, family-wage jobs in local communities? Do communities have the capacity to take advantage of these opportunities? Can public land managers structure work on the forests they manage in a way that provides local community benefit? and How can managers best engage communities in joint forest stewardship to achieve ecosystem management objectives and enhance the natural amenity values of forests?

Analysis of the Northwest Forest Plan from a social perspective also raises the question, Do broad-scale ecosystem management approaches that may make sense from the standpoint of biodiversity conservation and ecological sustainability also make sense from the standpoint of social and economic sustainability? Or are smaller-scale approaches more likely to succeed? Communities are using different strategies to adapt to changes in management policies and the larger social, political, and economic forces affecting them. Management plans that are too broad in scale may be unresponsive to variation in local conditions and needs. In addition, many people interviewed as part of the monitoring program perceived the Northwest Forest Plan as moving forest-management decision making from the local to the regional level, decreasing incentives and opportunities for collaboration. The question of scale deserves further research.

There have been many attempts to incorporate economic-development and social-justice goals in biodiversity conservation initiatives, most notably in the form of integrated conservation and development projects. One of the main challenges to success has been establishing effective links between conservation and development; development activities rarely have direct ties to conservation behavior (Salafsky & Margoluis 2002; Wells et al. 2004). Strategies for biodiversity conservation must be appropriate to the specific social and environmental contexts in which they are developed (Borgerhoff Mulder & Coppolillo 2005), as should broad-scale ecosystem management strategies. Where possible, however, broad-scale ecosystem management plans should seek to implement conservation strategies that contribute to healthy communities while fostering the engagement of those communities in ecosystem conservation. Key assumptions associated with this approach are (1) organizations engaged in ecosystem management have a broader mandate than to manage the biophysical sphere alone; they also seek to contribute to well-being in communities that surround the lands they manage; (2) active rather than passive forest management provides the best outcome for conservation; (3) communities have the capacity (e.g., skills, infrastructure, value-added industries) to engage in and contribute to forest stewardship; (4) a sustainable flow of resources can be produced from forests without undermining the ecological goals of management; and (5) socially unacceptable practices do not block the management process.

From a social perspective, the Northwest Forest Plan as a model for broad-scale ecosystem management is perhaps most valuable for its attempt to link the biophysical and socioeconomic goals of forest management by creating high-quality jobs for residents of forest communities in restoration, research, monitoring, and other forest stewardship activities that protect the environment.

Monitoring generates information that can be used to guide research. Research about what made these strategies successful in some places and not others can provide insight into how ecological sustainability, economic development, and social justice can be better integrated in future attempts at broad-scale ecosystem management.

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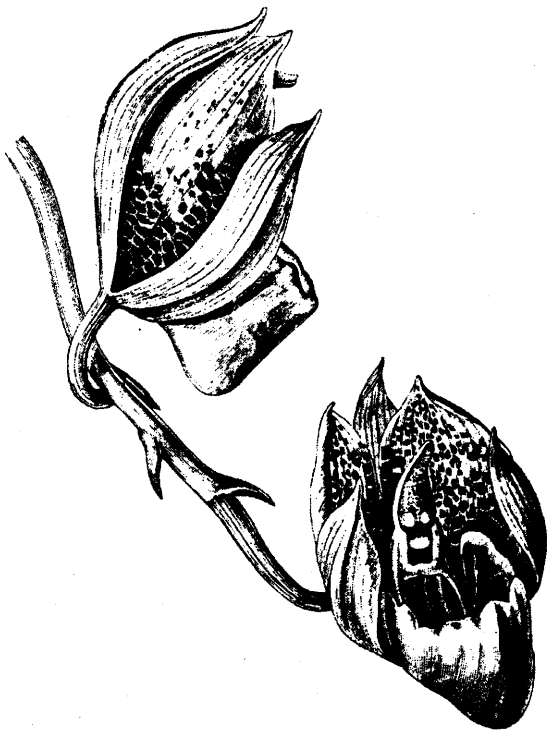
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