NORTHWEST FOREST PLAN
THE FIRST 10 YEARS (1994–2003)

Socioeconomic Monitoring Results
Volume I: Key Findings

Susan Charnley, Ellen M. Donoghue, Claudia Stuart, Candace Dillingham, Lita P. Buttolph, William Kay, Rebecca J. McLain, Cassandra Moseley, Richard H. Phillips, and Lisa Tobe

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PNW Pacific Northwest Research Station

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Northwest Forest Plan—The First 10 Years (1994–2003): Socioeconomic Monitoring Results

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Abstract

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The socioeconomic monitoring report addresses two evaluation questions posed in the Northwest Forest Plan (the Plan) Record of Decision and assesses progress in meeting five Plan socioeconomic goals. Volume I of the report contains key findings. Volume II addresses the question, Are predictable levels of timber and nontimber resources available and being produced? It also evaluates progress in meeting the goal of producing a predictable level of timber sales, special forest products, livestock grazing, minerals, and recreation opportunities. The focus of volume III is the evaluation question, Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management? Two Plan goals are also assessed in volume III: (1) to maintain the stability of local and regional economies on a predictable, long-term basis and, (2) to assist with long-term economic development and diversification to minimize adverse impacts associated with the loss of timber jobs. Progress in meeting another Plan goal—to promote agency-citizen collaboration in forest management—is evaluated in volume IV. Volume V reports on trends in public values regarding forest management in the Pacific Northwest over the past decade, community views of how well the forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems have been protected under the Plan (a fifth Plan goal), and issues and concerns relating to forest management under the Plan expressed by community members. Volume VI provides a history of the Northwest Forest Plan socioeconomic monitoring program and a discussion of potential directions for the program.

Keywords: Northwest Forest Plan, socioeconomic monitoring, timber and nontimber resources, rural communities and economies, collaboration, social values and forest management.

Preface

This report is one of a set of reports produced on this 10-year anniversary of the Northwest Forest Plan (the Plan). The collection of reports attempts to answer questions about the effectiveness of the Plan based on new monitoring and research results. The set includes a series of status and trends reports, a synthesis of all regional monitoring and research results, a report on interagency information management, and a summary report.

The status and trends reports focus on establishing baselines of information from 1994, when the Plan was approved, and reporting change over the 10-year period. The status and trends series includes reports on late-successional and old-growth forests, northern spotted owl population and habitat, marbled murrelet population and habitat, watershed condition, government-to-government tribal relationships, socioeconomic conditions, and monitoring of project implementation under Plan standards and guidelines.

The synthesis report addresses questions about the effectiveness of the Plan by using the status and trends results and new research. It focuses on the validity of the Plan assumptions, differences between expectations and what actually happened, the certainty of these findings, and finally, considerations for the future. The synthesis report is organized in two parts: Part I—introduction, context, synthesis, and summary—and Part II—socioeconomic implications, older forests, species conservation, the aquatic conservation strategy, and adaptive management and monitoring.

The report on interagency information management identifies issues and recommends solutions for resolving data and mapping problems encountered during the preparation of the set of monitoring reports. Information issues inevitably surface during analyses that require data from multiple agencies covering large geographic areas. The goal of this set of reports is to improve the integration and acquisition of interagency data for the next comprehensive report.

The socioeconomic status and trends report is published in six volumes. Volume I (this volume) of the report contains key findings. Volume II addresses the evaluation question, Are predictable levels of timber and nontimber resources available and being produced? The focus of Volume III is the evaluation question, Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management? Volume IV assesses the Plan goal of promoting agency-citizen collaboration in forest management. Volume V reports on public values regarding federal forest management in the Pacific Northwest. Volume VI provides a history of the Northwest Forest Plan socioeconomic monitoring program, and a discussion of potential directions for the program.

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Chapter 1: Introduction

In the early 1990s, controversy over harvest of old-growth forests led to sweeping changes in management of federal forests in western Washington, Oregon, and northwest California. These changes were prompted by a series of lawsuits in the late 1980s and early 1990s that effectively shut down federal timber harvest in the Pacific Northwest. In response, a Presidential summit was held in Portland, Oregon, in 1993. This summit led to issuance by President Clinton of a mandate for federal land management and regulatory agencies to work together to develop a plan to resolve the conflict. The President's guiding principles followed shortly after the summit in his *Forest Plan for a Sustainable Economy and Sustainable Environment* (Clinton and Gore 1996), now called the Northwest Forest Plan (the Plan).

Immediately after the summit, a team of scientists and technical experts were convened to conduct an assessment of options (FEMAT 1993). This assessment provided the scientific basis for the environmental impact statement and record of decision (ROD) (USDA and USDI 1994) to amend Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl (*Strix occidentalis caurina*).

The ROD, to be implemented across 24 million federal acres (9.7 million hectares), put in place a whole new approach to federal land management. Key components of the ROD included a new map of land use allocations—late-successional reserves, matrix, riparian reserves, adaptive management areas, and key watersheds. Plan standards and guidelines provided the specific management direction regarding how these land use allocations were to be managed. In addition, the Plan put in place a variety of strategies and processes to be implemented. These included adaptive management, an aquatic conservation strategy, late-successional reserve and watershed assessments, survey and manage procedures, an interagency organization, social and economic mitigation initiatives, and monitoring.

Monitoring provides a means to address the uncertainty of our predictions and compliance with forest management laws and policy. The ROD clearly states that monitoring is essential and required:

> Monitoring is an essential component of the selected alternative. It ensures that management actions meet the prescribed standards and guidelines and that they comply with applicable laws and policies. Monitoring will provide information to determine if the standards and guidelines are being followed, verify if they are achieving the desired results, and determine if underlying assumptions are sound.

Finally, Judge Dwyer reiterated the importance of monitoring in his 1994 decision declaring the Plan legally acceptable (Dwyer 1994):

> Monitoring is central to the [Northwest Forest Plan's] validity. If it is not funded, or done for any reason, the plan will have to be reconsidered.

The ROD monitoring plan provided a very general framework to begin development of an interagency monitoring program. It identified key areas to monitor, initial sets of questions, types and scope of monitoring, the need for common protocols and quality assurance, and the need to develop a common design framework. In 1995, the effectiveness monitoring program plan (Mulder et al. 1995) and initial protocols for implementation monitoring (Alegria et al. 1995) were approved by the Regional Interagency Executive Committee (RIEC)[1]. Approval of the effectiveness monitoring plan led to the formation of technical teams to develop the overall program strategy and design (Mulder et al. 1999) and monitoring protocols for late-successional and old-growth forests (older forests) (Hemstrom et al. 1998), northern spotted owls (Lint et al. 1999), marbled murrelets (*Brachyramphus marmoratus*) (Madsen et al. 1999), tribal (USDA and USDI 2002), and watershed condition (Reeves et al. 2004). Socioeconomic monitoring protocols continue to be tested.

Periodic analysis and interpretation of monitoring data is essential to completing the monitoring task. This important step was described in the overall monitoring strategy

[4]The RIEC is responsible for ensuring the prompt, coordinated, and successful implementation of the Northwest Forest Plan at the regional level, and also oversees the Northwest Forest Plan monitoring program and adaptive management process. An intergovernmental advisory committee advises the RIEC.

(Mulder et al. 1999) and the regional interagency executive committee approved a 5-year interpretive reporting cycle. This 10-year report is the first comprehensive analysis and interpretation of monitoring data since the ROD.

Socioeconomic Monitoring: Introduction and Report Overview

The socioeconomic monitoring report addresses two evaluation questions posed in the Plan ROD. The first question pertains to use of natural resources: Are predictable levels of timber and nontimber resources available and being produced? (USDA and USDI 1994: E-9). Volume II of the socioeconomic monitoring report analyzes trends in Forest Service (FS) and Bureau of Land Management (BLM) data for timber harvest, special forest products, livestock grazing, mineral extraction, and recreation to respond to this monitoring question. The second evaluation question concerns rural economies and communities: Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management? (USDA and USDI 1994: E-9). Volume III of the socioeconomic monitoring report focuses on this evaluation question.

These questions are rooted in concerns that prevailed in the early 1990s about how cutbacks in federal timber harvesting under the Plan would affect local forest communities in the Pacific Northwest.[2] Many of these communities had residents who worked in the timber industry as loggers, mill workers, secondary wood products manufacturers, and transporters of wood and wood products. In the early 1970s, timber industry employment in the Plan area (fig. 1) stood at about 6 percent of total employment in Washington, almost 12 percent in Oregon, and 31 percent in California (FEMAT 1993: VII-53). By the late 1980s, the relative importance of timber employment in each of these regions had declined by 50 percent (FEMAT 1993: VI-25).

Any reduction in federal timber harvest volumes had the potential to incur additional social and economic impacts on timber workers and their families in the region, especially on those depending on federal forest lands.[3] These workers were already being squeezed by global competition for wood and wood products markets, labor-saving technologies leading to increased mechanization in mills, and the economic recession that occurred in the early 1980s. Not only were jobs at stake; timber workers were an important part of many rural forest communities, contributing to their social and economic vitality. Logging, milling, and timber work formed the basis for a way of life in some communities. This way of life, and the cultural values and practices associated with it, were also threatened.[4]

Given the need for forest habitat and the need for forest products, President Clinton requested "a balanced and comprehensive strategy for the conservation and management of forest ecosystems, while maximizing economic and social benefits from the forests" (USDA and USDI 1994: E-1). The Plan sought to provide "…a sustainable level of human use of the forest resource while still meeting the need to maintain and restore the late-successional and old-growth forest ecosystem" (USDA and USDI 1994: 26–27). Thus, one socioeconomic goal of the Plan was to "produce a predictable and sustainable level of timber sales and nontimber resources that will not degrade or destroy the environment" (USDA and USDI 1994: 3). Volume II of this report evaluates progress in achieving this Plan goal during the first 10 years.

One assumption of the Plan was that by producing a predictable level of timber sales and nontimber resources, a second socioeconomic goal would be met: to maintain the stability of local and regional economies on a predictable, long-term basis (Haynes and Perez 2001, Mulder et al. 1999: 4, Tuchmann et al. 1996, USDA and USDI 1994: 26).

> The need for forest products from forest ecosystems is the need for a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economies, and

[2] We follow Danks (2003) in defining forest communities as those having economic, social, and cultural ties to nearby forests.

[3] On average, 30 percent of the timber produced in western Oregon and Washington each year between 1970 and 1990 came from Forest Service and BLM lands (Warren 2003).

[4] See Haynes and Grinspoon (in press) for a more thorough discussion of changes in the Pacific Northwest forestry sector since the 1940s and how it affected rural communities.

Figure 1—The range of the northern spotted owl and the Northwest Forest Plan area.

> contribute valuable resources to the national economy, on a predictable and long-term basis [USDA and USDI 1994: 26].

Volume III of this report evaluates progress in meeting this Plan goal.

In identifying principles that would guide development of a management plan to protect old-growth ecosystems and produce a sustainable level of timber, President Clinton said, "Where sound management policies can preserve the health of forest lands, sales should go forward. Where this requirement cannot be met, we need to do our best to offer new economic opportunities for year-round, high-wage, high-skill jobs" (USDA and USDI 1994: 3). A third socioeconomic goal of the Plan was: where timber sales cannot proceed, assist with long-term economic development and diversification to minimize adverse impacts associated with job loss (Mulder et al. 1999: 4, Tuchmann et al. 1996, USDA and USDI 1994: 3). Volume III of the socioeconomic monitoring report also evaluates progress in meeting this goal during the first 10 years of the Plan.

The Plan aimed to usher in a new collaborative approach to federal forest management. In particular, federal agencies would coordinate and collaborate with one another in managing federal forests in the Pacific Northwest (Tuchmann et al. 1996: 6, 44–48). Interagency collaboration was expected to increase efficiency, improve communication and information sharing, eliminate duplication, build trust, and reduce conflict between agencies (Tuchmann et al. 1996: 6–7). There would also be greater collaboration in forest management between agencies and citizens (Danks and Haynes 2001: 54, Tuchmann et al. 1996: 41, 60–61). Two formal institutions established under the Plan promoted agency-citizen collaboration in forest management: provincial advisory committees and adaptive management areas. A more collaborative approach to forest management was expected to improve relationships between agencies and the public, better link the Plan's economic and environmental objectives by integrating forestry and economic assistance, and reduce conflict over forest management. Thus, a fourth socioeconomic goal of the Plan was to promote interagency collaboration and agency-citizen collaboration in forest management. The socioeconomic monitoring team did not monitor interagency coordination and collaboration because

of a lack of resources. Instead, we focused on agency-citizen collaboration. Our evaluation of progress toward meeting this goal is contained in Volume IV of this monitoring report.

The Plan codified a shift in forest management away from the intensive timber management practices of the 1970s and 1980s toward ecosystem management. One of the goals in doing so was to protect the forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems. These forest values include amenity values (such as scenic quality, lifestyle), environmental quality values (such as clean air and water), ecological values (such as sustainability, biodiversity), public use values (recreation), and spiritual and religious values (Donoghue 2003: 334, Stankey and Clark 1992). Other Plan monitoring is designed to collect and analyze biophysical data that will be used to assess how well the Plan has achieved the goals and expectations associated with protecting older forest habitat, associated species (northern spotted owls and marbled murrelets), and aquatic and riparian ecosystems. The socioeconomic monitoring team addressed the topic of forest protection from the social perspective.

Protecting forest values and environmental qualities associated with older forest and aquatic ecosystems is a social value. Changing societal values are among the things that can trigger the adaptive management process (USDA and USDI 1994: E2). It is important to monitor how public attitudes, beliefs, and values relating to forest management change over time so that managers can be responsive. Volume V of the socioeconomic monitoring report contains a literature review that evaluates trends in public values regarding forest management in the Pacific Northwest between the early 1990s and the early 2000s.

People's perceptions of whether or not agencies are managing federal forests in ways that are consistent with their values, and of the effectiveness of agency management policies, can influence their behavior and their attitudes toward the agencies. Although public perceptions may not always be "accurate" from the scientific standpoint, they matter. The monitoring team interviewed community members from 12 case-study communities and agency employees from 4 case-study forests and documented their perceptions of how well the Plan had protected forest values and environmental qualities associated with older forests and aquatic ecosystems on federal forest lands. The team also documented community residents' issues and concerns relating to forest management under the Plan. The results of these interviews are contained in Volume V of this report.

The socioeconomic monitoring 10-year report is based on monitoring work that was conducted during 2003 and 2004 in the third phase of the module's development (which began in 1999). Phase III is considered a pilot phase of the socioeconomic monitoring program. The Regional Interagency Executive Committee has not officially incorporated socioeconomic monitoring into the Pacific Northwest Interagency Regional Monitoring Program. Nor is there a formal, published protocol for socioeconomic monitoring. As stated in the ROD, "The monitoring plan will be periodically evaluated to ascertain whether the monitoring questions and standards are still relevant, and will be adjusted as appropriate. Some monitoring items may be discontinued and others added as knowledge and issues change with implementation." (USDA and USDI 1994: E-1). Volume VI of this report evaluates the socioeconomic monitoring plan in the ROD; evaluates whether the questions, goals, and monitoring items are still relevant 10 years later; and assesses future options for the module to ensure that agencies have the socioeconomic information they need to support adaptive management in the Plan area. It is designed to help the RIEC decide the future of Plan-related socioeconomic monitoring.

The following tabulation summarizes the evaluation questions and Plan goals that are the topic of the socioeconomic monitoring 10-year report and the report volumes that present and discuss the monitoring questions, expectations, data, and conclusions associated with each of them. Volume I does not contain any monitoring data; rather, it summarizes the monitoring team's findings and conclusions.

ROD evaluation question/Plan goal	Report volume
Q1: Are predictable levels of timber and nontimber resources available and being produced?	Volume II
Q2: Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management?	Volume III
Goal 1: Produce a predictable and sustainable level of timber sales and nontimber resources that will not degrade or destroy the environment.	Volume II
Goal 2: Maintain the stability of local and regional economies on a predictable, long-term basis.	Volume III
Goal 3: Where timber sales cannot proceed, assist with long-term economic development and diversification to minimize adverse impacts associated with job loss.	Volume III
Goal 4: Promote interagency collaboration and agency-citizen collaboration in forest management.	Volume IV
Goal 5: Protect the forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems.	Volume V
New question: Are the socioeconomic evaluation questions, goals, and monitoring items still relevant?	Volume VI

Chapter 2: Methods

The information in this interpretive report is largely the result of retrospective monitoring. No socioeconomic monitoring program was established early in the Northwest Forest Plan (the Plan) period. Thus, there was no opportunity to formulate monitoring questions, identify appropriate indicators for answering those questions, and gather monitoring data associated with the indicators over the course of a decade, to compile and evaluate in this interpretive report. To a large extent, the monitoring team had to rely on existing data from secondary sources to answer the evaluation questions in the record of decision (ROD) and to evaluate success in meeting Plan socioeconomic goals. These data and their associated indicators were not always adequate for the task; data limitations are discussed in each report volume.

The monitoring team used a combination of quantitative and qualitative methods. The baseline year for the socioeconomic monitoring program was 1990. We chose 1990 as the baseline for several reasons. First, we use social and economic indicators from the U.S. census to assess community-scale socioeconomic change over time. The census happens once every 10 years (1990 and 2000). Second, although the Plan was implemented in 1994, the spotted owl (*Strix occidentalis caurina*) listing occurred in 1990, and was quickly followed by court injunctions against harvesting federal timber. Thus, the impacts of reduced federal timber harvesting began around 1991; the Plan was an attempt to restore the flow of federal timber. Finally, to evaluate the effects of the Plan on Pacific Northwest communities, it is helpful to compare what conditions were like before and after the Plan was implemented. It was not possible to obtain data as far back as 1990 for some indicators, however, so not all of the analyses begin with that year.

To answer the first evaluation question (Are predictable levels of timber and nontimber resources available and being produced?), we obtained data on timber sales, special forest products, grazing, mining, and recreation from Forest Service (FS) and Bureau of Land Management (BLM) databases and resource specialists. All of the monitoring teams associated with the Pacific Northwest Interagency Regional Monitoring Program were directed to obtain agency data from corporate databases, publications, or other sources available from agency national, regional, or state offices, rather than request data from individual FS and BLM field units (unless warranted by special circumstances). This approach imposed a set of limitations associated with data availability and data quality. Our team obtained most of the regional-scale resource and recreation data from FS regional and BLM state office specialists.

Our team asked for indicator data for 22 forest units in the Plan area (table 1). We aggregated the unit-scale data to obtain regionwide trends. Combining FS and BLM data was often impossible at the regional scale either because the agencies track different variables (indicators) for each resource, because data were not available for the same years, or both. Thus, most of the regional-scale indicator data are presented and analyzed by agency.

Table 1—Forest Service and Bureau of Land Management units included in calculations of resource and recreation outputs

State	Unit
Forest Service	
Washington	Okanogan[a]
	Wenatchee[a]
	Mount Baker-Snoqualmie
	Gifford Pinchot
	Olympic
Oregon	Mount Hood
	Willamette
	Siuslaw
	Deschutes[a]
	Umpqua
	Winema[a]
	Rogue River
	Siskiyou
California	Klamath
	Six Rivers
	Shasta-Trinity
	Mendocino
Bureau of Land Management	
Oregon	Medford
	Roseburg
	Salem
	Eugene
	Coos Bay

[a] Although these forests are only partially within the range of the northern spotted owl, data from the entire forest are analyzed in this report, unless otherwise indicated.

The analytical framework adopted by this module calls for showing that changes reflected by the trend data were caused by management actions under the Plan, or for providing alternative theories that could explain the changes observed. The team investigated links between trends in resource and recreation outputs, management actions under the Plan, and other explanatory variables by using a case-study approach. We selected four forests from four planning provinces in the Plan area for detailed study: the Olympic National Forest, the Mount Hood National Forest, the Klamath National Forest, and the Coos Bay BLM District (fig. 2). Case-study forests were chosen to represent one national forest in each of the three states that lie within the Northwest Forest Plan area, and one BLM unit in Oregon. They were also chosen to represent different provinces (the Plan area is broken up into 12 planning provinces). Because the monitoring effort was considered a pilot program, we wanted to conduct it on forests that were interested in participating and making use of the resultant information, so we used a nonrandom selection process. Two of the four case-study national forests volunteered to participate, and we approached the third because it was previously a high timber-producing forest. The Coos Bay District was chosen because the BLM Oregon State office recommended it. Team members interviewed a total of 78 agency employees from the four case forests and discussed trends in the indicator data for each resource area with program specialists, asking their perspectives on the reasons behind the trends observed, and the role of the Plan in influencing them.

The second evaluation question has two components: Are local communities and economies experiencing positive or negative changes, and are these changes associated with federal forest management? To assess whether local communities and economies were experiencing positive or negative changes, the team delineated 1,314 communities in the Plan area and used social and economic indicators from the U.S. census to analyze change in the communities between 1990 and 2000. The team also developed a community socioeconomic well-being index and analyzed differences in well-being between 1990 and 2000 and between communities located within 5 miles of a federal forest and farther than 5 miles away.

Finding direct connections between changes in forest management policy and socioeconomic change is difficult. To assess whether social and economic change in local communities and economies was associated with the Plan, the team examined trends in socioeconomic benefits from federal forests that potentially affect the well-being of forest communities. These benefits included jobs and income associated with forest resources and recreation, agency jobs, and procurement contracting opportunities. We examined regional-scale trends in these forest benefits for the period 1990–2003 by using quantitative data from agency databases and other secondary sources. We also examined local-scale trends in these benefits in four sample case-study areas. 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.

In addition, we evaluated the success of Plan mitigation measures designed to support rural communities and economies dependent on jobs in the wood products industry during a period of economic transition. These mitigation measures included (1) integrating forestry and economic development goals by creating new jobs in ecosystem restoration; (2) providing economic assistance to workers and their families, businesses, and communities through the Northwest Economic Adjustment Initiative; and (3) providing safety net payments to counties to help compensate for the loss of revenue sharing based on timber receipts.

To supplement the quantitative monitoring data, the team employed a community case-study approach to gather and analyze qualitative data that provide a more detailed understanding of (1) the social and economic conditions and trends described by the quantitative data, (2) how changes in the flow of forest benefits had contributed to change in local communities, and (3) how the Plan had affected the flow of socioeconomic benefits from federal forests. Interviews with 223 members of 12 communities

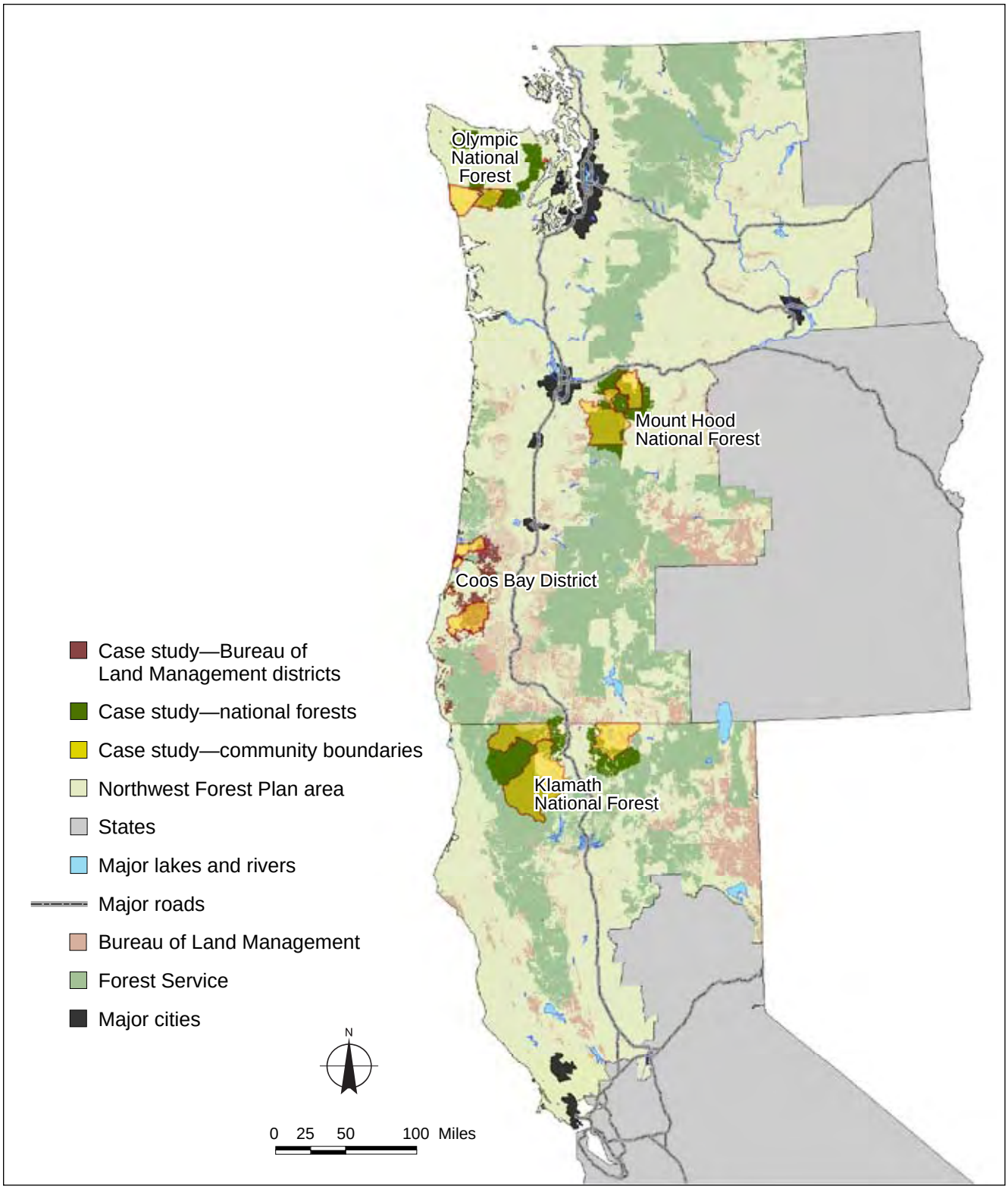

Figure 2—Case-study forests and associated communities. The case-study communities were the following: Olympic National Forest–Quinault Indian Nation, Lake Quinault Area, Quilcene. Mount Hood National Forest—Upper Hood River Valley, Villages of Mount Hood between Brighton and Rhododendron, Greater Estacada. Klamath National Forest—Butte Valley, Scott Valley, Mid-Klamath.Coos Bay District—Greater Reedsport, Greater Myrtle Point, Greater Coos Bay.

associated with the sample forests, and 82 agency employees working on the four forests were the source of these qualitative data. Three communities within 10 miles of each forest were randomly selected for monitoring. These data describe the social and economic effects of the Plan on local communities, and how agency efforts to mitigate Plan effects did or did not help communities adapt to change. We identify key patterns, themes, and insights that emerge from the cases and use them to advance our understanding of how federal forest management policy is linked to socioeconomic well-being in forest communities. These interviews are also the main source of data for evaluating progress in agency-citizen collaboration under the Plan, and evaluating how effective the Plan has been in protecting forest values and environmental qualities associated with older forest and aquatic ecosystems.

Chapter 3: Key Findings

Predictable Levels of Timber and Nontimber Resources

Were predictable levels of timber and nontimber resources produced during the first decade of the Northwest Forest Plan (the Plan)? The answer to the evaluation question differs by resource area. The amount of timber produced did not meet the probable sale quantity (PSQ) volumes anticipated during the first decade of the Plan, nor were timber sales offered at predictable levels. The average annual PSQ estimate for the first 9 years of the Plan (1995–2003) was 776 million board feet, taking into account the downward adjustments made to PSQ during that period, and the expectation that production would be under PSQ in the first 2 years. On average, about 526 million board feet of timber was offered for sale each year between 1995 and 2003. The average annual PSQ volume produced was about 421 million board feet. Timber sale levels were reasonably predictable between 1995 and 1998; between 1999 and 2003 they were not. The PSQ estimates were based on the expectation that most of the harvest volume would come from regeneration harvest of old forest stands in matrix and some adaptive management areas. This harvest expectation was not met. The Forest Ecosystem Management Assessment Team (FEMAT 1993) report acknowledged that it would be difficult to produce a predictable supply of timber under the Plan.

The best indicator for which agency data were available for assessing whether predictable levels of special forest products were produced was the quantity of products sold. This indicator is inadequate for answering the evaluation question because, for most products, the extent to which the quantity of products sold was determined by supply or by harvester demand is unknown. Moreover, the indicator reflects permitted harvest only. The quantity of convertible (can be converted to board feet) special forest products sold declined for both agencies, except for poles and posts on Bureau of Land Management (BLM) lands. Trends for nonconvertible products were mixed, and differed by agency. The declines that occurred in the quantity of fuelwood and some nonconvertible products sold were expected because of harvest restrictions in the reserves, and decreased timber harvesting.

Grazing declined on Forest Service (FS) lands during the first decade of the Plan. Data indicate that grazing also declined on BLM lands during the period, but to what extent this decline was real, or an artifact of changes in agency reporting practices, is uncertain. Some decline in grazing was expected under the Plan because of management constraints in the reserves. The Plan is only one of several factors likely to be responsible for reduced grazing on federal forests, however. Although the Plan caused some restrictions in riparian areas, other causes unrelated to the Plan (such as drought and the Endangered Species Act) reportedly had a bigger effect on grazing activity.

Minerals production was analyzed separately for leasables, locatables, and saleables, and for the FS only. No leasable minerals were produced during the first 10 years of the Plan, and the number of mineral leases was stable. The agencies do not track locatable minerals production, so we do not know whether predictable levels of locatable minerals were produced. Other indicators associated with locatable minerals show a decline in activity on the national forests during the decade, which was expected. The volume of salable minerals produced on National Forest System lands dropped, which was not expected. We do not know to what extent production trends were the result of the Plan or factors related to demand. The Plan was not believed to have been much of a constraint on minerals production during the first decade.

Our ability to determine whether predictable levels of recreation opportunities were reached during the monitoring period was limited by the shortage of regional-scale agency recreation data for the years before 1999. The data that are available indicate that some kinds of recreation opportunities decreased, some remained stable, and some increased. Opportunities to experience designated wilderness areas, to maintain a recreation residence, and to go downhill skiing appear to have remained stable or increased since the early 1990s. Opportunities to participate in roaded recreation and to access FS and BLM lands by passenger car decreased. Opportunities to experience unroaded and nonmotorized recreation settings increased. Regional-scale FS data for number of developed recreation sites indicate current status only. The number of developed recreation

sites on BLM lands has been stable since 1999. Data for ski area visitation, visitation on BLM lands, and number of outfitter and guide permits indicate that demand for recreation on Plan-area forests grew during the decade.

The monitoring results show that progress toward meeting the Plan goal of producing predictable levels of timber sales and nontimber resources has been mixed. For some resources, the existing data are inadequate for evaluating the goal. For some resources, production remained stable or increased. Production levels declined for other resources, and some declines were expected. Plan-related causes were the main reason that predictable levels of timber sales were not produced. The Plan was only one of several factors influencing trends for other resources.

Effects of Forest Management Policy on Local Communities

Did local communities and economies experience positive or negative changes that may be associated with federal forest management? What progress was made in maintaining the stability of local and regional economies on a predictable, long-term basis and in assisting with long-term economic development and diversification in communities affected by cutbacks in federal timber harvests?

The monitoring team examined trends in socioeconomic benefits from federal forest lands between the early 1990s and the early 2000s, and the ways in which the Plan may have contributed to these trends. The team also examined socioeconomic mitigation measures designed to offset some of the adverse effects of cutbacks in federal timber harvest, how effective they were, and why they were not effective in some cases. In addition, we examined social and economic change in Plan-area communities at the regional scale and in a sample of 12 forest communities to identify links between Plan implementation, the mitigation measures, and community change. Our main conclusions follow.

We began by taking a regional look at social and economic change in 1,314 communities in the Plan area. We analyzed 12 social and economic indicators from the U.S. census for the years 1990 and 2000, and also used U.S. census data to develop a community socioeconomic well-being measure that would help us evaluate change in community socioeconomic well-being over time. Our analysis of the census data found that communities in the Plan area are changing. The population is growing, educational attainment and household income are increasing, and poverty is decreasing. At the same time, the manufacturing sector of the economy is declining in many communities. Socioeconomic well-being increased for more than a third of the communities in the region, and decreased for about the same number between 1990 and 2000.

Almost 5 million people lived in communities in the Plan area in 2000, and just over 2 million of these lived within 5 miles of federal forest lands. Using a socioeconomic well-being index we developed, we found that 40 percent of the communities within 5 miles of FS- or BLM-managed lands had decreases in socioeconomic well-being between 1990 and 2000, compared with a 33-percent decrease for communities farther than 5 miles from federal forest lands. Generally, Plan-area communities with lower socioeconomic well-being tended to be those within 5 miles of FS and BLM lands, composing 71 percent of all communities that scored low or very low in socioeconomic well-being in 2000. Forty-three percent of the communities that received high or very high scores, however, were also within 5 miles of federal forest lands. Although some communities within 5 miles had relatively high socioeconomic well-being, income inequality also has increased there. Drivers of socioeconomic change, such as increasing income inequality, migration, shifts in dominant industry sectors, and aging populations all affect community socioeconomic well-being.

Maintaining the Stability of Local and Regional Economies

Jobs and Income From Resources and Recreation on Federal Forests

In the early 1990s, residents of forest-based communities expressed concern over the uncertainty around the timing and quantity of federal timber sales (FEMAT 1993: VII-70). Communities wanted stability, predictability, and certainty in timber supplies (FEMAT 1993: VII-77). Many people believed that if federal agencies produced a stable, even flow of timber, social and economic stability in rural forest communities would be assured (see sources cited in Richardson

1996). The Plan socioeconomic goal of maintaining the stability of local and regional economies on a predictable, long-term basis by producing predictable levels of timber sales, nontimber resources, and recreation opportunities reflects this thinking.

Volume II, chapter 2 of this report states that predictable levels of timber sales were not produced during the first decade of the Plan. Trends in special forest products sold, mining, and recreation opportunities were mixed, and grazing declined. In chapter 3 Volume III, we report that it was not possible to measure jobs and income associated with grazing, mining, and harvesting special forest products on federal forest lands in the Plan area because of lack of data. It was possible to measure jobs and income associated with timber harvest and recreation; however, for recreation the only available data pertained to current status on FS lands. In the early 2000s, recreation opportunities provided by FS lands in the Plan area supported about 17,500 direct jobs, and 25,500 total jobs.

The main adverse social and economic effects of the Plan were expected to be associated with the loss of jobs and income from reduced federal timber harvests. Federal timber supplies dropped over the course of the 1990s, and federal agencies did not produce anticipated PSQ volumes. Thirty thousand direct timber industry jobs were lost between 1990 and 2000 in the Plan area (compared to Plan expectations of 25,000 jobs lost). Most of this job loss was in nonmetropolitan counties, with Oregon being the hardest hit of the three states. 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 can be attributed to cutbacks in federal harvests triggered by the listing of the northern spotted owl and subsequent injunctions on timber sales. Timber supplies across all ownerships in the Pacific Northwest were relatively stable during the last half of the 1990s. Nevertheless, about 11,000 of the 30,000 timber industry jobs lost during the 1990s were lost in the last half of the decade. About 400 of the 11,000 jobs lost since 1994 can be attributed to a net reduction in federal timber harvesting. The remaining 10,600 job losses occurred during a period of increased log availability to local mills, and are the result of less efficient mills closing, and mills continuing to invest in labor-saving technologies. This timber industry restructuring was in response to reductions in timber log supplies from the levels at the start of the decade and the shift to harvesting smaller diameter trees. The contribution of federal timber to the total timber supply dropped in the Plan area from about 25 percent in 1990 to 10 percent in 1995 to less than 5 percent by 2000.

Although stable timber supplies may contribute to economic stability, they do not ensure it. This finding is consistent with research undertaken in the 1990s that shows how assuming community stability depends on nondeclining, even flows of timber from federal forests can be misleading (see sources cited in Kusel 1996, Richardson 1996). Many factors can influence the stability of forest-based communities (USDA FS 2000: 3-326–3-329). Demand for wood and commodity prices fluctuates; alternative sources of supply are available; some firms prefer locating close to large labor markets rather than in geographically isolated areas; mills compete for timber supply; communities compete for jobs; wood products manufacturing technology changes; and other federal and state policies affecting the business climate change. All of these forces can affect jobs in the timber industry, and neither agencies nor communities have much influence over them. Consequently, the concept of community stability has come to be replaced by the concept of community resiliency—the ability of communities to respond and adapt to change in positive, constructive ways to mitigate the effects of change on the community (Harris et al. 2000: 6).

The expectation that the Plan would provide predictable levels of resource outputs and recreation opportunities, which would in turn provide predictable levels of employment, was not achieved with respect to timber supply. The timber projections for FS and BLM lands in the Plan area were not realized and there was a lot of variation across the years since the Plan was implemented. However, increased harvests from other ownerships and the redirection of logs from the export market to local processing industries have mitigated some of these impacts.

Agency Jobs and Offices

Agency jobs can also affect community stability. The five western Oregon BLM districts lost 166 full-time equivalents (FTEs) between 1993 and 2002, or 13 percent of their workforce. No BLM district or resource area offices closed during this period, however, meaning that there was a continued presence of agency decisionmakers in local communities. National forests in the Plan area lost 3,066 FTEs between 1993 and 2002, representing a 36-percent decline in the workforce. This loss was more than expected, and it led to a consolidation of field offices. The number of FS offices containing forest supervisors declined by two, and the number of offices containing district rangers dropped by 20 during the period, representing a 23-percent reduction in the number of communities housing FS offices that contained a line officer. Some of these offices closed completely; others persisted, but with greatly reduced staffing. The FS job loss was most severe among units in Oregon and Washington.

The FS and BLM are often two of the few sources of quality jobs in forest-based communities, and their employees often make an important contribution to community well-being. Agency jobs help to maintain the presence of community members who contribute leadership skills, invest in improving their communities, and substantially enhance community capacity. The FEMAT report recognized that the presence of FS and BLM offices in small, isolated communities enhances community capacity, and that office closures could devastate some of these communities. Not only displaced timber workers, but FS employees moved out of their communities in the 1990s as they retired or went to work elsewhere, contributing to the loss of productive community members. The negative effects of these changes are described for some of the case-study communities (Volume III, chapter 8). The loss of agency jobs was largely tied to declines in agency budgets associated with reduced timber harvesting under the Plan.

Agency Budgets

Between 1993 and 2003, western Oregon BLM unit total budgets rose by 22 percent. In contrast, Plan-area FS unit budgets declined by 35 percent. These trends can be compared to national-scale trends in agency budget appropriations. Between 1993 and 2003, total FS agency appropriations grew by 41 percent, and total BLM agency appropriations grew by 79 percent.

The 35-percent decline in FS unit budgets occurred at the same time that FS field-unit budget allocations for fire and fuels management rose from 7 to 29 percent of the total. Excluding fire and fuel management funding, FS budgets for all other activities dropped 50 percent during the decade. This meant that the FS had much less funding for conducting non-fuel-related forest management activities in 2003 than in 1993. We were unable to obtain data for earlier years; however, agency budget specialists interviewed stated that budget declines began around 1990. The BLM field units received a smaller proportion of fire and fuel management dollars. Nevertheless, excluding fire rehabilitation and fuel management money, BLM unit budgets still rose by 12 percent, providing additional money for accomplishing non-fire-related forest management work.

The decline in FS budgets between 1993 and 2003 can largely be attributed to the decline in timber receipts during the period. Although BLM timber sales also decreased during the decade, BLM funding was not as heavily dependent on trust and permanent operating accounts derived from timber receipts. The BLM units lost staff despite budget increases, but rising funding levels allowed them greater flexibility in selecting among potential means of accomplishing needed work (such as partnerships, Jobs-in-the-Woods, contracting). The BLM managers also had relatively wide latitude in directing investments among programs within the Oregon and California railroad lands (O&C) allocation, which composed the majority of the BLM Plan-area unit budgets. In the early 1990s, BLM realigned about 20 percent of the O&C funding away from timber management activities and toward other forest management activities more consistent with Plan goals (Priebe 2004). Although O&C funding declined slightly during the period, BLM funding was not as sensitive to trust and permanent operating accounts derived from timber receipts as FS allocations were. Although O&C funding declined during the period, allocations to all other BLM program accounts grew. These increases were mostly attributable to additional funding

for the timber and recreation pipelines, for the forest health initiative, for fire rehabilitation and fuel management, and for the management of land and resources.

Procurement Contracting for Ecosystem Management Work

Procurement contracting is another way in which agencies create jobs that local communities potentially benefit from. Although contract work associated with intensive timber management (forestry services) was expected to decrease under the Plan, contract work in ecosystem restoration was expected to increase, helping to offset job loss in both the forestry services and timber sectors.

This expectation was not met. Although there was a proportional shift in work types away from labor-intensive contracting associated with intensive timber management and toward technical and equipment-intensive work associated with ecosystem restoration, this shift occurred in the context of an overall decline in contract spending. This decline can be attributed to a reduction in FS procurement contracting. The BLM contract spending remained fairly constant between the early 1990s and the early 2000s, averaging just under $20 million per year. Forest Service spending declined throughout the period, dropping from $103 million in 1991 to $33 million in 2002.

We attribute these differences in agency contract spending primarily to the differences in agency budget trends during this period. The FS did not have the money to invest in procurement contracting, and local managers sometimes chose to accomplish work in-house to keep people employed, rather than to invest in contracting. Thus, FS procurement contracting did not help offset economic decline in the Plan area during the first decade of the Plan. Added to this problem, the Plan did not contain adequate provisions for targeting local community residents with procurement contracting opportunities. Only about one-quarter of the agencies' contract value in the early 1990s and the early 2000s was awarded to contractors from rural communities (communities having populations under 5,000), though the value awarded by the BLM increased to one-third of the total by the 2000s.

From the local perspective, community case-study results indicate that anticipated jobs in forest restoration never really materialized. Procurement contract spending for ecosystem management on the four case forests varied annually and was driven in part by natural disasters. There was an overall decline in contract spending between 1990 and 2002 on all four case forests, ranging from 15 to 78 percent. Only a handful of case-study community residents reported that they or people they knew had obtained agency contracts to do forest restoration work. Those that had, viewed them as a supplemental, rather than a stable, form of income owing to their sporadic nature and the short season of work entailed. Our findings indicate that to date, there have not been sufficient resources to provide full-time, year-round employment in forest restoration work on the case-study forests for more than a few people. Moreover, contract work is often linked to natural disasters such as fires and floods, which are unpredictable.

Community Effects of Plan Implementation

What were the effects of this declining flow of socioeconomic benefits from federal forests on rural communities and economies? Our analysis of U.S. census indicators revealed that 40 percent of the communities within 5 miles of federal forest lands decreased in socioeconomic well-being between 1990 and 2000, 37 percent increased, and 23 percent showed little change. The census data do not reveal why, however. We monitored a sample of case-study communities, and interviewed community members in order to identify these effects. Socioeconomic well-being scores rose in two, dropped in four, and showed little change in six of the communities between 1990 and 2000. As was expected, not all communities were affected the same way, or to the same extent, by the Plan.

All of the case-study communities we monitored showed changes over the last two decades. Although timber was one of the major economic sectors in all of these communities in the 1970s and 1980s, the timber sector had become minor or negligible in many of these communities by 2003. Federal forest management policy was just one

of many variables shaping the nature of change in these communities, and the extent of its effects varied considerably. These effects depended 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 FS employment. For example, the timber sector was an important component of the economy in the Quinault Indian Nation in 1990, but tribal and private forest lands largely supported that sector. Hence interviewees from that community did not report any major effects from changes in federal forest management policy. In contrast, communities such as Quilcene, Upper Hood River Valley, and the Mid-Klamath participated heavily in the wood products industry until the late 1980s. Loggers worked mainly on national forest lands, and local mills obtained most of their wood from federal forests. These communities were hard hit by the reduced federal timber supplies. Although the timber industry was of secondary importance in the Villages of Mount Hood in 1990, many FS employees lived there. The decline in agency jobs associated with reductions in FS timber programs strongly affected the Villages of Mount Hood and several other case communities, just as the loss of timber sector jobs did.

The Plan was not the only variable causing the Pacific Northwest timber economy to change. The timber sector in some communities—such as Greater Coos Bay—had been declining since the early 1980s because of an economic recession, domestic and international competition, changes in market demand for wood products, industry restructuring, mechanization and technological advances, and environmental regulations—and the Plan added to these pressures. Other case-study communities, such as the Mid-Klamath, seemed to be relatively buffered from the changes that affected the industry during the 1980s. Interviewees there perceived the halt of federal timber production around 1990 as the beginning of the end.

Some communities were sustained through the transitional period of the 1990s by having a substantial agricultural sector, being near a major transportation corridor, or being close to a popular recreation and tourism destination. Other communities experienced an influx of retirees, commuters, mobile or self-employed workers, second-home owners, 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. Tribal forest lands also helped sustain local timber economies in some areas.

Assistance With Long-Term Economic Development and Diversification

Did Plan mitigation measures assist with the transition, and promote long-term economic development and diversification in communities affected by cutbacks in federal timber harvests? Procurement contracting for forest restoration was not an effective mitigation measure at the regional scale, as discussed above. The Northwest Economic Adjustment Initiative and safety-net payments to county governments were the primary mitigation measures intended to help with the economic transition.

Northwest Economic Adjustment Initiative

The Northwest Economic Adjustment Initiative (NEAI) had five objectives: provide immediate relief for distressed timber communities; create an environment for long-term economic development; develop new mechanisms for delivering assistance; emphasize partnerships with states and the critical role of local governments; and emphasize the use of performance-based standards for funding. The BLM and the FS had three primary community economic assistance programs designed to provide short-term relief and long-term economic diversification through the Initiative: Jobs-in-the-Woods (JITW), Rural Community Assistance (RCA), and the Old-Growth Diversification Fund (OGDF). These programs were relatively small in terms of total initiative dollars.

Regarding short-term mitigations, many view the initiative programs as too little, too late. Timber industry restructuring and timber supply changes were occurring, to a large degree, before the initiative dollars became available

in 1994. The OGDF provided loans to retain existing businesses, and was viewed as successful. Local jobs for ecosystem management activities were targeted through JITW, and some short-term jobs were created. The RCA program provided grants to the private sector for projects related to forest management, which helped. The initiative did not deliver on agency and public expectations to provide immediate help to displaced timber workers and their families, however, and many believe that the dollars that were available were out of proportion to the magnitude of the effects.

Regarding long-term mitigations, it can be argued that it is too soon to assess the success of the initiative's long-term economic diversification projects. The OGDF, a revolving loan fund providing grants and loans to small businesses to promote expansion and diversification, still provides a long-term sustainable source of capital for resource-related businesses and is considered highly successful. Community-based planning was a focus of the RCA program. Projects to improve community capacity—such as leadership development, community-based planning, and technical assistance to help communities write grants—were aimed at helping communities help themselves. In reviews of the initiative these "soft infrastructure" projects were considered vital to the success of initiative projects. The RCA program also supported economic diversification, funding projects such as market and feasibility studies and business plans; whether these were generally successful is debatable. The initiative also helped communities and businesses by funding hard infrastructure development projects (such as business parks and water and sewer systems). Although many communities have improved their infrastructure and are better poised for economic development opportunities, these opportunities had yet to materialize in most of the communities we studied.

Jobs-in-the-Woods has been characterized as the most complex component of the initiative because it requires "simultaneous and innovative consideration of forest ecosystem management, workforce development and employment, community economic needs, interagency coordination (within the federal government), and federal-nonfederal collaboration with relevant partners" (Tuchmann et al. 1996: 201). The BLM JITW program met with such success that it persisted as an annual budget appropriation. Although BLM funding for community economic assistance through JITW dropped somewhat when the NEAI ended, it has been stable since 1999. Despite the BLM's successes, to many, JITW has been the greatest disappointment of all of the components of the initiative because public expectations regarding the quality and number of jobs that would be created to offset job losses in the timber industry were never realized.

Another objective of the initiative was to design new ways for federal agencies to conduct business in collaboration with nonfederal and community partners. The Community Economic Revitalization Teams (CERTs) developed organizational ground rules and incorporated "one-stop-shop" and "lead agency" techniques to streamline program delivery. Collaborative groups identified, prioritized, and greatly leveraged available funds. The RCA program provided technical assistance to small, remote, unincorporated communities to enable them to organize and compete for funding. The program also had the flexibility for managers to provide "gap" funding for identified critical projects to fill in where other agencies couldn't. Criteria for program funding emphasized new and sustainable resource-based businesses and jobs in resource-dependent communities. The JITW and RCA program managers developed expertise within the agencies to coordinate and integrate complex community and agency needs and community-based programs. Assessments of the innovative aspects of these programs in promoting collaboration between agencies and partners to deliver assistance rate them as highly successful.

The 12 case-study communities we monitored received vastly different amounts of initiative money. Many of the case communities reported benefiting from initiative-supported projects, particularly those involving physical infrastructure development. These did not always succeed in attracting new businesses or industries, however. It is too soon to tell what the long-term benefits of some of these projects will be. Other successes were reported in the areas of community planning and small business loans. Initiative-supported efforts to develop alternate wood products sectors that use federal timber have largely failed to materialize yet. And, the majority of community members we interviewed

believed the initiative had done little to help displaced timber workers. One exception was the Coos Bay JITW program, which was viewed as a success, though it created only a few jobs.

What the initiative largely failed to do was to create sustainable local jobs during the first 10 years of the Plan comparable to the number and quality of those lost because of reductions in federal timber harvest. Economic shifts evolve over long periods, and expecting new jobs to be created instantly is unreasonable. Moreover, many rural resource-based communities have relatively slow growth and are subject to fluctuations owing to national and international economic forces beyond their control. Although the transition is not over, the initiative is. A focus on local job creation as a long-term goal is still needed in the context of new programs and sources of money. Forest Service funding for community economic assistance has returned to about what it was before the Plan. The JITW and RCA programs are no longer funded by Congress, the administration, or the agency. A number of new programs are emerging, however, with many of the same long-term objectives and community-based, collaborative designs contained in initiative-supported programs. Experience implementing the NEAI resulted in lessons that can be applied to future efforts by federal government agencies to provide community economic assistance.

Payments to Counties

The Omnibus Budget Reconciliation Act of 1993 and the Secure Rural Schools and Community Self-Determination Act of 2000—designed to stabilize payments to county governments in the face of declining revenues from the timber receipts generated by federal forest lands—have generally mitigated the effects of declining timber receipts. The initial payments-to-counties legislation (the Omnibus Budget Reconciliation Act) generally mitigated Plan effects for the 48 counties covered by the legislation. The counties in other parts of the Plan area (in eastern Washington, Oregon, and other parts of California) did not fare as well until the Secure Rural Schools Act extended these payments to all of the eligible counties in the region and across the United States.

Some of the intent behind the Omnibus Budget Reconciliation Act of 1993 was to provide a transition to a lower rate of assistance. The transitional path downward was replaced by a much higher rate of revenue support under the Secure Rural Schools Act.

The goal of the payments to counties legislation was clearly met. The legislation has replaced past dependence on timber-harvest revenues and has generally mitigated the lost revenues associated with the declines in federal timber harvest in the region. It is not known how the owl safety-net payments have affected overall county financing. In the short term, a guaranteed amount is likely to have a stabilizing effect. The Secure Rural Schools legislation, however, sunsets on September 30, 2006. The long-term stability of the payments is uncertain.

Without new congressional action, counties in the Plan area will need to address a projected $270 million in revenue shortfall. Congressional hearings are expected in 2005 to address the possibility of reauthorization of the Secure Rural Schools legislation. Rural communities continue to rely on stabilized payments to counties. The lack of secure funding for schools, transportation, and other social services produces a great deal of uncertainty in communities that depend on this income, especially given a climate of declining revenues from other sources. Land management agencies do not have decisionmaking authority over legislation on payments to counties. Long-term legislation to address the issue would be a major contribution, however; the Forest Counties Payment Committee has developed recommendations for what such legislation might contain (http://www.countypayments.gov/).

Plan Effects on Community Well-Being

Rural communities and economies underwent both positive and negative changes during the first decade of the Plan. The Plan contributed to negative changes in some communities, primarily because of reduced federal timber harvests and the loss of associated jobs and income, substantial decreases in the number of agency jobs, and declines in procurement contract spending. The Plan may have contributed to positive changes in some communities by enhancing natural amenity values on federal forest lands

such as natural-looking landscapes, recreation opportunities, older forest habitat, fish, and clean water. Natural amenities attract tourists, new residents, and businesses that stimulate local economic development. We do not have enough evidence to assess the Plan's contributions to positive change, however. Nor could we evaluate to what extent recreation was sustaining communities that were formerly timber based. Interview results indicated that recreation and amenity values played a role in drawing new residents to communities around federal forests that lost timber workers and FS employees in the 1990s. Recreation and tourism also played an important and evolving role in contributing to the economies of some communities. Several interviewees from the case communities viewed recreation and nature-based tourism as the natural-resource-based sectors holding the greatest potential for local economic development, and several communities are working with the agencies to promote recreation and tourism locally.

One Plan-related change made apparent from the local-scale monitoring results was that communities are finding it increasingly difficult to sustain themselves in a manner that links their local economy and culture to the natural resources that surround them, and to federal forest lands in particular. Although some communities still had a wood products industry, federal timber played a minor, if any, role in supporting that industry. Many interviewees reported that the lack of forest-based, family-wage jobs in their communities was one of the biggest issues of concern relating to federal forest management. And the fact that a declining number of community members make a living from federal forest lands means that relations between local residents and FS and BLM personnel are becoming more distant. Some local people have been less interested in forest management issues.

Collaboration

The monitoring team investigated whether relations between federal land management agencies and local communities, and agency-citizen collaboration in forest management improved under the Plan. We reviewed the literature on collaboration in adaptive management areas (AMAs) and provincial advisory committees (PACs). We also interviewed forest employees and community members in the case-study areas about collaborative relations between the FS, the BLM, and the public.

Adaptive management areas represent a significant agency investment in collaborative innovation, making up 6 percent of the Plan area in subregions known to be socially and economically affected by declining timber harvest. A primary social objective of the AMAs was to provide opportunities for the agencies, citizens, communities, landowners, and other local groups to work together and develop innovative approaches to forest management that would help sustain forest communities (USDA and USDI 1994: D-4). Timber harvest under the Plan is expected only in the matrix land allocation and some AMAs. The literature reports that most of the AMAs have failed to meet Plan expectations for collaboration.

Initial collaboration with local communities showed promise. The potential for success was diminished early in the period, however, when adjudication and the Federal Advisory Committee Act (FACA) chartering forced federal participants to withdraw temporarily, severely affecting local trust in this new form of collaboration. In some cases, conflict among polarized interests also caused collaboration to collapse, forcing federal officials to work with disparate groups rather than in a unified partnership.

Internal agency issues further impaired the ability of AMA managers to collaborate effectively, including a lack of demonstrated, long-term agency commitment to AMA staffing and funding; a lack of incentives to guide and support local AMA managers in shouldering risk; and an unwillingness or inability among the regulatory agencies to consider localized adaptive management—and its potential for small-scale experimental failures—as a legitimate approach for improving larger-scale conservation knowledge and techniques.

Despite the cumbersome membership requirements also imposed upon them by FACA, PACs have been more successful in engaging local communities. Because of this success, these committees were rechartered in 2003 and continue to operate. They have provided a forum for ongoing, multiparty discussion of forest management issues among decisionmakers and local stakeholders. In this

capacity, they represent an important step forward over project-scale "scoping" as defined under the 1969 National Environmental Policy Act (NEPA). They have also been successful in completing regionwide, multiparty compliance monitoring. Provincial advisory committee monitoring efforts have fulfilled requirements for implementation monitoring under the Plan.

Progress toward achieving the collaboration goal in less formal institutional settings across all case-study forests and communities was mixed. The Plan has had direct and indirect, positive and negative effects on collaborative forest stewardship on the case-study forests and communities. The Plan's ecosystem focus and emphasis on interagency collaboration encouraged interactions among public and private landowners and broadened the range of stakeholders and opportunities for collaborative processes. A variety of groups, together with forest agencies, are pooling resources—such as time, labor, finances, and ideas—to achieve mutually held forest stewardship objectives. Faced with challenges of decreased budgets and staffs, the forests have been able to maintain viable, productive, and multibeneficial collaborative projects and programs. The volunteer programs are good examples of programs that are evolving and seeking new collaborative opportunities in the face of administrative and budgetary constraints.

Lower timber harvest rates and lower budgets and staff, which have both direct and indirect ties to the Plan, have influenced trends in collaboration in two key yet paradoxical ways. With decreasing human and financial resources for forest management activities, the forests have expanded and developed partnerships with groups that share similar resource management goals. The paradox is that, as budget declines serve as an incentive for innovation and expansion of collaborative processes to achieve forest stewardship objectives, they simultaneously constrain and potentially jeopardize collaborative efforts. Agency interviewees expressed concern that reducing staff and resources has made managing collaborative processes more difficult.

Increased diversity and innovation in collaboration, however, has coincided with a decrease in communication and collaboration with a once-prominent forest stakeholder, namely the timber community. The disconnect between timber-based communities and forest managers and how that would affect collaborative relations were unanticipated consequences of reducing timber harvests under the Plan. In general, collaborative activities with members of the case-study communities were minimal, with some exceptions, such as tribal collaboratives.

New connections have yet to replace old timber ties in some communities. Interviewees from former timber-based communities tended to feel disassociated from, or unaware of, current forest policies and practices or they had little direct concern with forest management. And yet, some former timber-industry employees who remained in their communities felt that their skills, knowledge, and experience in forest management could serve contemporary forest management practices but were not being used. Other factors that affected the participation of community residents in collaborative resource management beyond the necessity of a shared mutual interest or stake included shortages of residents with skills to do the work, residents with the time to participate, consistent players and participation, organized groups with resources, and residents who are struggling to make ends meet.

Forest units appear to rely increasingly on partnerships, volunteers, and collaborative forest stewardship efforts to get their work done because they lack the budgets and staff to accomplish the work themselves. The success of these efforts depends on the capacity of communities to engage in them. Community capacity, in turn, is partially a function of the presence of organized and active civic groups, people with leadership skills, and so on. By providing local communities with forest benefits, agencies are building community capacity. In return, one payoff will be communities that are more able and motivated to engage with forests to conduct forest stewardship activities and collaborative forest management. If local residents see federal forests as a source of community benefit, ties will more likely develop that can help communities and forests sustain one another.

Some new collaborative mechanisms are achieving important successes and providing good models. A well-defined avenue for giving input related to decisionmaking is a strong incentive for community members to begin to actively engage in collaborative forest management and forest

stewardship activities. Some models of collaboration that provide members of the public with resources (like money) and a decisionmaking role (such as how to spend that money) to promote both forest and community benefits seem to have strong public support and serve as good models for collaboration. Although they are relatively new, resource advisory committees provide one such model. Resource advisory committees receive money through Title II of the Secure Rural Schools and Community Self-Determination Act. As time and experience provide insight into their success, perhaps some lessons can be learned from them as to how to better engage in agency-citizen collaboration. Multiparty monitoring, as conducted by PACs, is another potential model.

Forest Management Values and Issues of Concern

The forest management paradigm that prevailed in the Pacific Northwest following World War II emphasized high-yield timber production by using techniques such as clearcutting, removal of logs and snags, slash burning, thinning, and planting single-species stands on harvested areas (FEMAT 1993: II-2-3). The agencies assumed that forests managed in this way could be harvested on a sustained-yield basis at 40- to 80-year intervals without negatively affecting other resources such as water quality, fish, soils, and wildlife. Studies conducted in the 1970s and 1980s made it apparent that this approach to forest management was not going to adequately protect the biodiversity of late-successional forests and associated aquatic ecosystems (FEMAT 1993: II-2-3). The forest management paradigm embraced in the 1990s under the Plan focuses on ecosystem management objectives that aim to sustain the underlying ecological processes of the forest (Johnson et al. 1993). Agencies are placing more emphasis on managing for forest restoration, recreation, and other noncommodity values. Was this paradigm shift supported by public attitudes, beliefs, and values regarding forest management in the Pacific Northwest, and do members of the public still support this management approach today?

A literature review we conducted of studies that document public views of forest management in the Pacific Northwest between 1990 and 2002 showed that the answer to both questions is "yes." Between 1990 and 2002 there has been surprisingly little change in Pacific Northwest residents' views of how Pacific Northwest forests should be managed. Throughout this period, research findings indicate that people support forest management to provide a broad set of multiple uses and both economic and environmental benefits. Nevertheless, there has consistently been a pro-environment leaning, with the majority favoring environmental over economic management objectives when asked to make a choice between them. Continued support for timber production from federal forests has likely been tied to a belief that the wood products industry is important to the regional economy and to concern for the health of rural communities. Whereas place of residence was not found to be a significant factor influencing people's attitudes, beliefs, and values about forest management prior to the Northwest Forest Plan, recent studies find that urban residents tend to be pro-environment, with rural residents having more evenly split views on forest management issues.

Throughout the study period, the belief that active forest management improves forest health has predominated. However, clearcutting has consistently been unpopular, and the majority have favored old-growth protection. Forestry techniques that are not intensive (such as thinning and selective harvesting) are favored by most people surveyed.

Have federal land managers been doing a good job of protecting the forest values and environmental qualities people care about under the Plan? Our literature review did not provide extensive evidence for answering this question. The evidence that does exist suggests that opinion is fairly evenly divided. Some people have favorable views of the job forest managers are doing, and others believe that forest managers need to improve their performance.

We interviewed community residents in the 12 case-study communities and asked them whether they believed the Plan had protected forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems. These interviews showed that many local residents had sophisticated perceptions of complex ecological processes and relations. Interviews also showed

that most community members care deeply about nearby forests and their ecological integrity. Members of the public interviewed perceived that the Plan had had mixed results to date for forest protection.

The most positive Plan effects were believed to be associated with the protection of aquatic ecosystems. Many interviewees commented that decreases in logging, road decommissioning, the provisions of the aquatic conservation strategy, the riparian reserve system, and the emphasis placed on watershed management and restoration under the Plan had protected and improved water quality. Some also perceived that fish populations had increased.

Most interviewees did not distinguish Plan effects on older forests from those on forest ecosystems more generally. Although the Plan brought an end to earlier forest management practices that many considered ecologically destructive, most people interviewed did not believe federal forests were currently healthy. Like many Pacific Northwest residents surveyed in other studies, they believed silvicultural activity was necessary for keeping forests healthy, and that not enough had occurred during the first decade of the Plan. This led to concerns about fire, insects, and disease and to frustration that needed forest work was not creating local jobs.

Timber harvest, forest health, and forest-based jobs were among the biggest issues of concern to community interviewees. The other main issues of concern were recreation and forest access, also tied to the issue of jobs. Interviewees overwhelmingly believed that the Plan had emphasized forest protection over community well-being. Yet most also believed that healthy forest ecosystems and healthy community economies can and should be linked and that those links are currently weak.

One of the foremost issues of concern relating to forest management expressed by community members interviewed for this study was the lack of family-wage jobs in their communities, especially jobs that are tied to forest resources.

Our monitoring results show that local communities are in some ways becoming less "forest-based" as their economic ties to nearby forests change. Rather than being a place of work for community members, federal forests are evolving into places that attract tourists, recreationists, and amenity migrants, and passers-through who local residents hope will spend money in their communities. The communities we monitored were becoming places of residence for people seeking the amenity values they offer, but who commute or live elsewhere to make a living, who no longer need to work, or who don't work. Young people were finding it difficult to live in the rural communities they were raised in because employment options were lacking. Thus, federal forest lands are becoming more backdrops to life in rural communities and places to recreate around them, rather than sources of sustainable rural livelihoods—and the character of these communities is changing. These changes are consistent with a broader trend in the American West, where rural logging, ranching, and farming communities are struggling to make a living off the land and to persist as a part of sustainable, working landscapes.

Federal forest management policy was only one of several variables that contributed to job loss in the natural-resource-based sectors of the study communities. Nevertheless, our monitoring results indicate that increasing federal-forest-based employment opportunities would make an important contribution to community well-being. The desire for forest-based, family-wage jobs remains a top priority in the case-study communities, especially those not located near regional centers or urban areas that provide commuting options.

The Plan aimed to provide "… a sustainable level of human use of the forest resource while still meeting the need to maintain and restore the late-successional and old-growth forest ecosystem" (USDA and USDI 1994: 26). Our findings suggest that this goal has not been met from the human-use perspective, and that it remains one of the most important challenges of federal forest management today in the Plan area.

Institutional Capacity

The FEMAT (1993) report recommended that the units implementing the Plan be supported with stable staffing and budgets to support the new approach to ecosystem management:

> Pending additional fiscal analysis, we emphasize that the options selected should not be hastily coupled with reductions in funding and personnel based on the inappropriate assumption that ecosystem management is somehow cheaper than traditional commodity production-focused Plans (FEMAT 1993: VIII-41).

This recommendation was not met for the FS. That BLM funding rose and staffing dropped slightly during the first decade, while FS funding and staffing dropped by more than one-third, provides an opportunity to examine differences in the institutional capacity of the agencies to be effective in achieving the Plan's socioeconomic goals.

Regarding resource and recreation outputs, no important differences emerged from the data regarding the production of predictable levels of timber, nontimber forest products, and recreation by the agencies, although the case-study results found that the BLM was more successful than the FS in developing new recreation opportunities. Timber sales and associated jobs and income declined for both agencies.

Otherwise, the BLM was generally more effective than the FS in providing socioeconomic benefits during the first decade of the Plan. As described in this volume, agency job loss was much more severe for the FS than for the BLM (36 percent for the FS, 13 percent for the BLM). Nearly one-quarter of the FS offices in the Plan area closed or shrank in size with the loss of Forest Supervisors and District Rangers, while no BLM offices closed or lost line officers. The BLM procurement contracting held steady while FS contracting declined 68 percent. The BLM still maintains a JITW program, while FS community economic assistance funds have returned to pre-Plan levels.

Although many factors have likely contributed to these differences, a driving force behind these changes was differences in agency budget trends. The BLM Plan-area unit budgets increased by 22 percent between 1993 and 2003 (while total agency appropriations for BLM rose 79 percent at the national scale). Meanwhile, FS Plan-area unit budgets decreased 35 percent (while total FS appropriations rose 41 percent at the national scale). The Pacific Northwest Region (Region 6) had sharper declines in both budget and staffing than did the Pacific Southwest Region (Region 5), with several Region 6 units losing 50 to 60 percent of their budgets and FTEs during this 10-year period. These differences played an important role in influencing agency capacity to provide community benefits under the Plan. This reduction in agency capacity occurred at the same time that the Plan added new and sometimes complicated procedural and analytical requirements that both agencies had to comply with in undertaking projects on the forests. These new requirements used resources that the agencies might have invested in other ways.

Local-scale monitoring found that the BLM district in our sample—Coos Bay—was able to invest in ecosystem management activities aligned with Plan goals (such as habitat restoration, recreation, fish and wildlife, and environmental education), while the timber and roads programs declined. If the other four units are similar, BLM units were prepared to undertake ecosystem management activities consistent with Plan goals and to invest in programs and collaborative efforts that would help provide local communities with socioeconomic benefits.

In contrast, the FS units we sampled had trouble accomplishing routine forest management activities and infrastructure maintenance under the Plan, much less providing socioeconomic benefits to communities. Interviewees commonly identified budget and staffing shortfalls as critical factors limiting their ability to meet Plan objectives. Although FS managers tried to implement the Plan's measures and to achieve Plan goals with their substantially reduced resources, they had limited success. Many community interviewees acknowledged the FS efforts to meet Plan goals and recognized that they were unable to do so because of institutional constraints.

Future Monitoring

We find that the Plan goals are still relevant and are consistent with the broader missions and strategic goals of the FS and the BLM, although some could be reworded. We also find that the ROD evaluation question that has received most of the socioeconomic monitoring program's attention

to date—Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management?—could be revised. We recommend focusing monitoring on the links between land management agencies, federal forests, and rural communities and economies that produce positive outcomes for community well-being and forest ecosystem health.

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Metric Equivalents

When you know:	Multiply by:	To find:
Miles	1.609	Kilometers
Acres	.405	Hectares
Board feet, log scale	.0045	Cubic meters
Board feet, lumber scale	.0024	Cubic meters

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