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

Northwest Forest Plan—The First 10 Years (1994–2003): Socioeconomic Monitoring of the Klamath National Forest and Three Local Communities

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Abstract

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This report examines socioeconomic changes that took place between 1990 and 2003 on and around lands managed by the Klamath National Forest in California to assess the effects of the Northwest Forest Plan (the Plan) on rural economies and communities there. Three case communities were studied: Scott Valley, Butte Valley, and Mid-Klamath. The report characterizes the region and its history, discusses management changes on the forest under the Plan and how they were perceived, describes socioeconomic change in the communities and how they were linked to the Plan, and evaluates how well Plan socioeconomic goals were met by the Klamath National Forest.

Keywords: Socioeconomic monitoring, Northwest Forest Plan, forest communities, rural development, Klamath National Forest.

Preface

In the early 1990s, controversy over harvest of old-growth forests led to sweeping changes in the 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,[1] 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.[2] This assessment provided the scientific basis for the Environmental Impact Statement and Record of Decision (ROD)[3] 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 acres of federal forest lands (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 program, an interagency organization, social and economic mitigation measures, 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 (see footnote 3):

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[1] Clinton, W.J.; Gore, A., Jr. 1993. The forest plan for a sustainable economy and a sustainable environment. Washington, DC: The White House. 7 p. plus appendices.

[2] Forest Ecosystem Management Assessment Team [FEMAT]. 1993. Forest ecosystem management: an ecological, economic, and social assessment. Portland, OR: U.S. Department of Agriculture; U.S. Department of the interior [and others]. [Irregular pagination]

[3] U.S. Department of Agriculture; U.S. Department of the Interior. 1994. Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl. [Place of publication unknown]: 74 p. (plus attachment A: standards and guidelines).

> 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:[4]

> 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[5] and initial protocols for implementation monitoring[6] were approved by the Regional Interagency Executive Committee. Approval of the effectiveness monitoring plan led to the formation of technical teams to develop the overall program strategy and design,[7] and monitoring protocols for late-successional

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[4] Dwyer, W.L. 1994. Seattle Audubon Society, et al. v. James Lyons, Assistant Secretary of Agriculture, et al. Order on motions for Summary Judgment RE 1994 Forest Plan. Seattle, WA: U.S. District Court, Western District of Washington.

[5] Mulder, B.; Alegria, J.; Czaplewski, R. [et al.]. 1995. Effectiveness monitoring: an interagency program for the Northwest Forest Plan. Portland, OR: U.S. Department of Agriculture, Forest Service and U.S. Department of the Interior, Bureau of Land Management [et al.]; report; Monitoring Design Group, Intergovernmental Advisory Committee.

[6] Alegria, J.; Hyzer, M.; Mulder, B.; Schnoes, B.; Tolle, T. 1995. Guidance for implementation monitoring for management of habitat for late-successional and old-growth-related species within the range of the northern spotted owl. [Unpublished document]. On file with: Regional Ecosystem Office, 333 SW First Avenue, Portland, OR 97204.

[7] Mulder, B.S.; Noon, B.R.; Spies, T.A.; Raphael, M.G.; Palmer, C.J.; Olsen, A.R.; Reeves, G.H.; Welsh, H.H. 1999. The strategy and design of the effectiveness monitoring program for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-437. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 138 p.

and old-growth forests,[8] northern spotted owls,[9] marbled murrelets[10] (*Brachyramphus marmoraturs*), tribal relations,[11] and watershed condition.[12] Socioeconomic monitoring protocols continue to be tested.[13]

Periodic analysis and interpretation of monitoring data is essential to completing the monitoring task. This important step was described in the overall monitoring strategy (see footnote 7), and the regional interagency executive committee approved a 5-year interpretive reporting cycle. In 2005 and 2006, 10-year reports were published that contain the first comprehensive analysis and interpretation of monitoring data since the ROD.

This report on socioeconomic monitoring of the Klamath National Forest and three local communities in northern California is linked to the socioeconomic monitoring 10-year interpretive report (see footnote 13). It contains detailed results from one of four case-study areas in which local-scale monitoring was conducted to complement regional-scale monitoring, the focus of the interpretive report.

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[8] Hemstrom, M.; Spies, T.; Palmer, C.; Kiester, R.; Teply, J.; McDonald, P.; Warbington, R. 1998. Late-successional and old-growth forest effectiveness monitoring plan for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-438. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 37 p.

[9] Lint, J.; Noon, B.; Anthony, R.; Forsman, E.; Raphael, M.; Collopy, M.; Starkey, E. 1999. Northern spotted owl effectiveness monitoring plan for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-440. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 43 p.

[10] Madsen, S.; Evans, D.; Hamer, T.; Henson, P.; Miller, S.; Nelson, S.K.; Roby, D.; Stapanian, M. 1999. Marbled murrelet effectiveness monitoring plan for the Northwest Forest Plan. Gen. Tech. Rep. PNW-GTR-439. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 51 p.

[11] U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Bureau of Land Management. 2002. Tribal monitoring under the Northwest Forest Plan. Interagency executive letter. www.reo.gov.

[12] Reeves, G.; Hohler, D.; Larsen, D.; Busch, D.; Kratz, K.; Reynolds, K.; Stein, K.; Atzet, T.; Hays, P.; Tehan, M. 2004. Effectiveness monitoring for the aquatic and riparian component of the Northwest Forest Plan: Conceptual framework and options. Gen. Tech. Rep. PNW-GTR-577. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 71 p.

[13] Charnley, S., tech. coord. 2006. Northwest Forest Plan—the first 10 years (1994-2003): socioeconomic monitoring results. Gen. Tech. Rep. PNW-GTR-649. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 6 vol.

Summary

This case study was developed to respond to two socioeconomic effectiveness monitoring questions posed in the Northwest Forest Plan (the Plan) Record of Decision (ROD). The first focuses on use levels of natural resources: Are predictable levels of timber and nontimber resources available and being produced? (USDA and USDI 1994: E-9). The second evaluation question relates to 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).

The evaluation questions posed in the ROD are based on a set of goals and expectations that were associated with the Plan when it was designed. One goal was to produce a predictable and sustainable supply of timber sales, nontimber forest resources, and recreation opportunities that would help meet a second goal: to maintain the stability of local and regional economies on a predictable, long-term basis (USDA and USDI 1994: 26). Where timber sales could not proceed, a third goal was to minimize adverse impacts on jobs by assisting with long-term economic development and diversification in rural communities most affected by the cutbacks in harvesting (USDA and USDI 1994: 3). The Northwest Economic Adjustment Initiative aimed to promote this goal and was expected to provide both immediate and long-term relief to rural people, businesses, and communities suffering from reductions in federal timber harvests (Tuchmann and others 1996: 155–156). The fourth socioeconomic goal of the Plan was to establish a system of terrestrial and aquatic reserves that would protect forest values and environmental qualities associated with late-successional and old-growth forest ecosystems (Clark et al. 1999: 15, Clinton and Gore 1993, USDA and USDI 1994: 8-10). Fifth, the Plan aimed to usher in a new approach to federal forest management. In particular, federal agencies were called on to collaborate with one another in managing federal forests in the Pacific Northwest. Greater collaboration in forest management was also expected between agencies and citizens (Clinton and Gore 1993; Danks and Haynes 2001: 54; Tuchmann and others 1996: 6, 44–48).

This report addresses the ROD socioeconomic monitoring questions, and examines whether Plan goals and expectations were met, at the local scale on the Klamath National Forest (KNF) in northern California and in three communities adjacent to the KNF: Scott Valley, Butte Valley, and Mid-Klamath. It draws on quantitative and qualitative monitoring data gathered from existing secondary sources and interviews with KNF employees and community members. We summarize the monitoring results here.

Question 1—Are predictable levels of timber and nontimber resources available and being produced?

Goal 1—Produce a predictable and sustainable level of timber sales and nontimber resources that will not degrade or destroy the environment.

Timber outputs were not predictable. Under the Northwest Forest Plan and the Klamath Forest Plan, the KNF allowable sale quantity (ASQ) was set at 51 million board

feet annually. This level represents about 25 percent of the average annual volume of timber harvested during the 1980s. The KNF has met ASQ twice since 1995, in 1996 and 1997. Since then, the annual volume of timber offered for sale has fluctuated, but has been less than the ASQ.

Trends in the volume of special forest products sold differed by product. The volume of convertible special forest products sold (fuelwood and Christmas trees) declined between 1990 and 2002. The volume of poles and posts sold remained fairly stable during the period. Trends for nonconvertible products differed.

The grazing program on the KNF declined slightly since 1994. The volume of salable minerals removed fluctuated considerably, and was substantially lower than the volume removed during the 1980s. Locatable minerals activity declined. Leasable minerals activity remained constant.

The recreation program has remained fairly stable overall. Interviewees reported increases in river rafting, recreational mining, and backcountry use. Trail and facilities maintenance was lagging. There was a slight decrease in roads and associated recreation opportunities.

Question 2—Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management?

Of the 37 census block group aggregates (or "communities") that are within 5 miles of the KNF, 4 (11 percent) increased in well-being, 19 (51 percent) decreased in well-being, and 14 (38 percent) showed little change between 1990 and 2000, according to the index developed for this monitoring program.

In the early 1970s, the wood products industry accounted for 31 percent of total employment in northern California counties within the range of the northern spotted owl (*Strix occidentalis caurina*) (FEMAT 1993:VII-53). By 1985–89, the industry accounted for 15 percent of total employment in the region, half of what it had been a decade earlier. Thus, the timber industry had been undergoing change for more than a decade prior to the Plan, with negative effects on timber workers. The Plan contributed to these effects.

This report describes the kinds of impacts that three forest-based communities surrounding the KNF experienced as a result of the decline of the wood products industry. Of the three communities, the most severe effects occurred in the Mid-Klamath community. This community is virtually surrounded by the KNF, had a timber economy that was mainly dependent on federal timber, is more remote, and was less economically diverse than the other two case communities. The reduction in timber harvesting on the KNF spurred the outmigration of many timber workers, Forest Service employees, and their families from these communities. This outmigration in turn triggered other social and economic community impacts, and caused a loss of community capacity that has been slow to rebuild.

Interviewees from all three communities reported that the KNF did not contribute to socioeconomic well-being in their communities by providing timber, as it once did. The

small mills that remained in Butte Valley did not use national forest timber. Scott Valley had few remaining timber workers. Those Mid-Klamath residents who were still trying to make part of their living in the wood products industry were frustrated by the lack of reliable supplies of federal timber, which made it difficult for them to make a living. The KNF did play an important role in providing local ranchers with grazing allotments that are critical to their viability. However, the Plan standards and guidelines reportedly increased their operating costs on national forest land. Mining was negligible, except for recreational mining. Special forest products were important to tribes. The Plan had hampered the ability of the KNF to manage for cultural products desired by tribes, however. Matsutake mushrooms (*Tricholoma magnivelare*) had commercial importance, but provided little in the way of economic benefit to local residents; most harvesters and buyers came from outside the area. These harvesters did support local businesses when they were in town. Interviewees had mixed views about the KNF's contributions to recreation and tourism development.

Communities are adapting in their own ways. The Scott Valley and Butte Valley communities have been sustained to some degree by having strong agricultural components. Butte Valley is located along a major transportation corridor, and is not far from the regional center of Klamath Falls, Oregon, which offers job opportunities. Scott Valley is likewise within commuting distance of the regional center of Yreka, California, and the Interstate-5 corridor. Retirees have moved into all three communities. And the Karuk Tribe has played a fundamental role in contributing to community development in the Mid-Klamath. For the most part, community members interviewed did not view the Forest Service as helping them adapt to changes brought about by forest management policy in any meaningful way.

Goal 2—Maintain the stability of local and regional economies on a predictable, long-term basis.

Goal 3—Where timber sales cannot proceed, assist with long-term economic development and diversification to minimize adverse impacts associated with job loss.

We assessed several socioeconomic benefits that the KNF provides that potentially contribute to community well-being and long-term economic development and diversification in local communities. In addition to timber and nontimber forest products and recreation opportunities, we examined trends in agency jobs, procurement contracts for land management, community economic assistance, and payments to county governments.

The KNF went from having 636 employees in 1993, to 441 in 2003, a loss of 31 percent. This job loss was related to a decline in the forest budget of 18 percent between 1993 and 2002 and had a strong impact on local employment opportunities. Declining budgets and staffing caused some of the forest's ranger district offices to close or consolidate in the 1990s.

Between 1990 and 2002, the KNF spent a total of $44.5 million procuring land management services. Most of this spending (64 percent) took place between 1990 and 1993. After 1993, contract spending on the KNF dropped off sharply. Between 1990–1992 and 2000–2002, contract spending declined 78 percent.

The Northwest Economic Adjustment Initiative (NEAI) brought nearly $2 million in grant money to the KNF over the course of 9 years. Most of the NEAI money became available during the first 4 years of the Plan. Rural community assistance grants made up most of this funding. In general, NEAI money from the KNF and other agencies supported some worthwhile projects in communities–particularly in the arena of community planning and infrastructure development. It did not, however, assist displaced timber workers, or result in sustainable local job creation.

Northwest Forest Plan mitigation measures resulted in substantially higher payments to counties than would have been received through forest revenue sharing alone given diminishing timber harvests. The Secure Rural Schools Act provided the highest level of payments to counties since 1990. In addition to being an important source of revenue to support roads and schools countywide, payments to counties under the Secure Rural Schools Act have contributed a significant amount of money to support local resource-related projects on and around the KNF. The Siskiyou County Resource Advisory Committee (RAC) made over $1.7 million available for resource-related projects on both private and national forest lands in the county between 2001 and 2003. Many interviewees expressed concern over the fact that the Secure Rural Schools Act provisions expired in 2006, with reauthorization uncertain.

The overall picture of changing socioeconomic benefits from the KNF since the Plan was adopted is one of decline. Mitigation measures associated with the Plan have helped in some small ways, but not nearly at a scale that compensates for this loss of benefits.

Goal 4—Promote agency-citizen collaboration in forest management.

The formal institutions established under the Plan to promote agency-citizen collaboration in KNF management (Provincial Advisory Committees and Adaptive Management Areas) apparently did not live up to their expectations, although we did not systematically investigate their effectiveness. At the community level, between 1994 and 2003, relations between the KNF and most community stakeholder groups grew more distant. Community interviewees viewed the KNF and forest management issues as becoming less relevant to their daily lives.

Initially, there were sincere attempts at collaboration to successfully implement the Plan and to achieve its objectives. However, community groups grew frustrated as Plan-related collaborative efforts failed to achieve their goals. Moreover, local communities had a limited capacity to engage in collaboration. Their ability to collaborate depended on the presence of organized groups, local leaders, and members that had the time, money, and motivation to get involved. On the agency side, the reduction in

on-the-ground KNF personnel, and the emphasis on interagency collaboration, made it harder for the agency to interact with local communities. The successes that have occurred have often been the result of individual KNF personnel who took the initiative to make a local program or collaborative effort work.

Goal 5—Protect the forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems.

The vast majority of interviewees said that timber harvest practices on the KNF prior to the Plan were unacceptable, and undermined the health of the forest. The Plan was seen as putting a stop to environmentally-destructive forest management practices. However, there was widespread agreement that some silvicultural activity, particularly thinning, was necessary to promote forest health. Most interviewees viewed the minimal amount of active forest management that occurred under the Plan as being detrimental to the forest, and as undermining many of the forest values and environmental qualities that the Plan was designed to enhance. They commonly cited the increased fire risk to spotted owl habitat as an example of this problem. Some forest protection measures associated with the Plan–particularly survey and manage requirements–were viewed by many interviewees as being overly protective. Other people felt the Plan had not gone far enough in protecting old-growth habitat. Interviewees reported the greatest successes in the arena of aquatic ecosystem conservation.

The report concludes with lessons learned from the socioeconomic monitoring work that can be applied for adaptive forest management.

Contents

Chapter 1: Introduction

This study was undertaken as part of the Northwest Forest Plan Socioeconomic Monitoring Program, which is part of the Pacific Northwest Interagency Regional Monitoring Program. It is one of four case studies conducted during 2003 for the purpose of assessing the effects of the Northwest Forest Plan (the Plan) on rural economies and communities within the range of the northern spotted owl (*Strix occidentalis caurina*).[1] The owl range defines the Plan area (fig. 1). This document is a supplement to Charnley (2006), which contains regional-scale socioeconomic monitoring results for the Plan area for 1990-2003. It contains a level of detail not found in that report and is intended to be useful to the Klamath National Forest (KNF) and surrounding communities. Three case "communities" associated with the KNF are the focus here: Scott Valley, Butte Valley, and Mid-Klamath corridor (fig. 2).

This case study was developed to respond to two socioeconomic effectiveness monitoring questions posed in the Northwest Forest Plan Record of Decision (ROD). The first focuses on use levels of natural resources: Are predictable levels of timber and nontimber resources available and being produced? (USDA and USDI 1994: E-9). The second evaluation question relates to 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).

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The remainder of chapter 1 provides a description of the monitoring methods, followed by a brief background description of the KNF and surrounding area. Chapter 2 focuses on trends in socioeconomic benefits from the KNF between 1990 and 2003, and how the Plan influenced those trends. Chapter 3 turns to the three case-study communities and examines changes that took place in the communities between 1990 and 2003 and the role of the Plan in influencing those changes, community adaptation to change and the role of the KNF in mitigating Plan effects, and changing relations between the KNF and the communities over time. Chapter 4 looks at communities and issues relating to the management of the KNF. It discusses collaboration and joint forest stewardship, how well the Plan has protected forest values and environmental qualities on the forest, and issues and concerns relating to forest management. Chapter 5 concludes by returning to the two monitoring questions and the five socioeconomic goals of the Plan. It assesses how well those goals were met during the first 10 years on the KNF, and responds to the monitoring questions in the context of the Klamath case study.

[1] The other case studies are from the Olympic National Forest in Washington (Buttolph et al. 2006), the Mount Hood National Forest in Oregon (Kay et al. 2007), and the Coos Bay Bureau of Land Management District in Oregon (McLain et al. 2006).

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

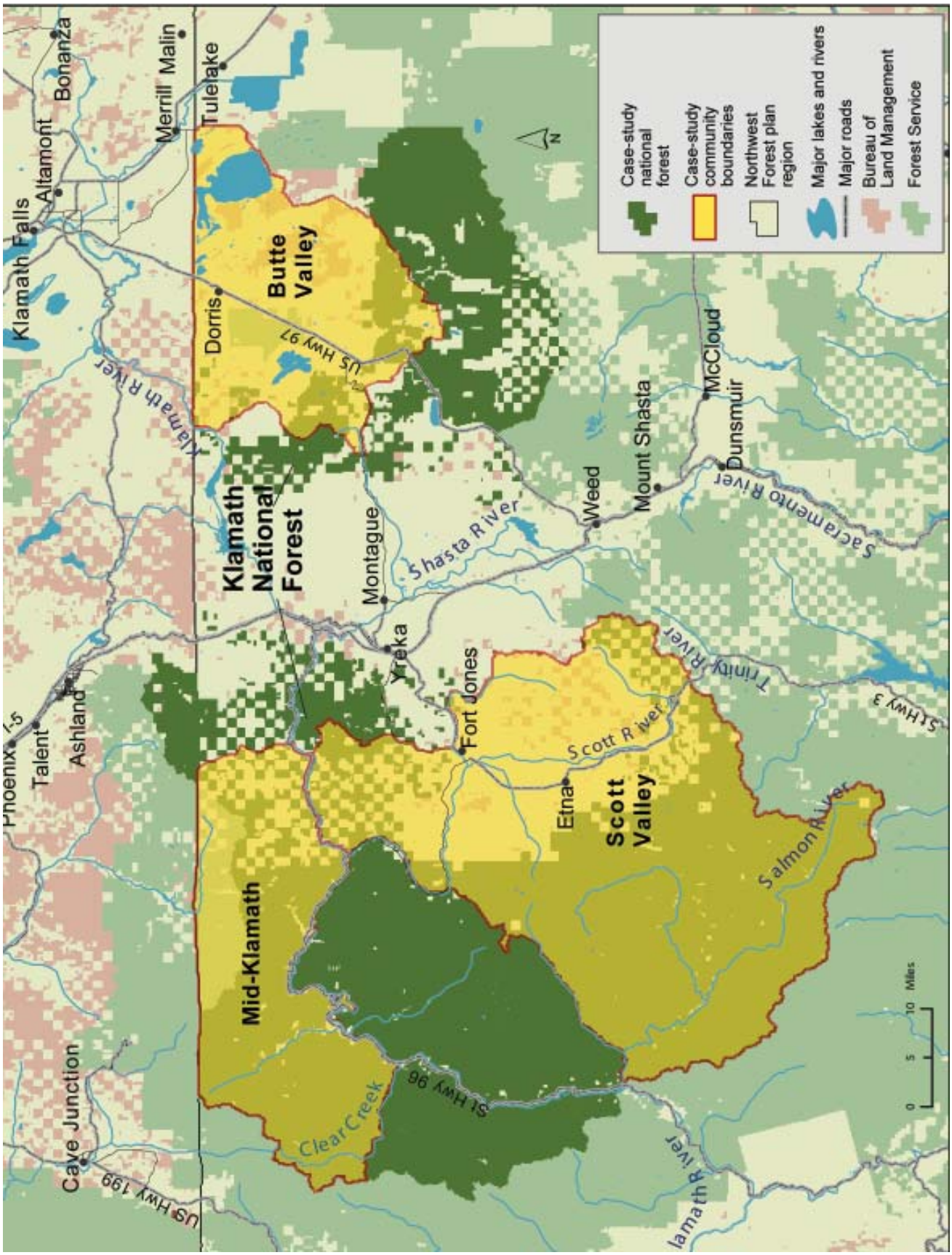


Figure 2—The Klamath National Forest and three case-study communities.

Methods

Case-study forests were chosen to represent one national forest in each of the three states that lie within the Plan area, and one Bureau of Land Management (BLM) unit in Oregon. They were also chosen to represent different provinces (the Plan area is broken up into 12 planning provinces). We used a nonrandom selection process and approached the KNF because it was previously a high timber-producing forest.

The socioeconomic monitoring team used a mixed-methods approach to conduct regional and local-scale monitoring. We chose 1990 as the baseline year for the monitoring program 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 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 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 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 or regional offices, rather than requesting data from individual field units (unless warranted by special circumstances). For the KNF, however, we had access to forest-level data because one of the team members was an employee there. Some of the forest-level data are for years not available from other sources. When we compared data for the KNF from regional or national sources with those obtained directly from the forest, we sometimes found differences in the numbers. In such cases, we used the data from the KNF for our analysis. Our ability to answer the monitoring question (Are predictable levels of timber and nontimber resources available and being produced?) and to evaluate the Plan goal (produce a predictable and sustainable level of timber sales and nontimber resources) was limited by the availability and quality of agency data.

The analytical framework adopted by this module called 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 from the KNF, management actions under the Plan, and other explanatory variables by interviewing 15 Forest Service employees from the KNF (app. A). We 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. Fully researching the causes of trends in resource and recreation outputs from federal forest lands since the Plan was adopted was beyond the scope of this exploratory study. However, the interview results provide a starting point for developing and testing hypotheses about how the Plan has affected the ability of the KNF to produce predictable quantities of timber sales and nontimber resources.

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, we used social and economic indicators from the U.S. census to analyze change in the communities between 1990 and 2000. The monitoring team also developed a community socioeconomic well-being index based

on six census indicators (Donoghue and Sutton 2006), and analyzed differences in well-being between 1990 and 2000.[2]

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, we examined trends in socioeconomic benefits from federal forests that potentially affect the well-being of forest communities. In addition to forest resources and recreation, these benefits included agency jobs and procurement contracting opportunities. We examined local-scale trends in agency jobs and procurement contracting on the KNF using quantitative data from agency databases and other secondary sources. 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 the Northwest Economic Adjustment Initiative, which provided economic assistance to workers and their families, businesses, and communities; and safety-net payments to counties to help compensate for the loss of revenue sharing based on timber receipts.

To supplement the quantitative monitoring data, we used 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 socioeconomic benefits from the KNF contributed to change in local communities, and (3) how the Plan affected the flow of socioeconomic benefits from the KNF. Interviews with 62 community members of the 3 case communities and 15 agency employees working on the KNF were the source of these qualitative data (app. A). These interviews were also the main source of data for evaluating progress in agency-citizen collaboration under the Plan, and how effective the Plan has been in protecting forest values and environmental qualities associated with older-forest and aquatic ecosystems.

Case-study communities associated with the KNF were chosen on the basis of a number of criteria. The monitoring team delineated 1,314 nonmetropolitan communities in the Plan area by aggregating census block groups (BGAs) according to several characteristics, such as school district boundaries, county lines, and transportation corridors (Donoghue 2003). The team identified a sampling frame of communities that included all of the BGAs whose polygons lay, at least partially, within a 5-mile radius of KNF boundaries. The team chose this distance because they wanted to focus the monitoring work in forest-based communities, and assumed that communities close to federal forests would have social, economic, or cultural ties to those forests. We then met with agency employees from the KNF and showed them our sample frame. We discussed which of the communities within our sample frame currently or historically maintained some kind of relations with the forest and the Forest Service, and which did not. This process narrowed our sample frame.

We selected three communities associated with the KNF from the sample frame for monitoring because time and budget constraints did not allow for a larger community sample. We recognized, however, that by choosing only three communities, we may not have captured all of the variation in community "types," or in community-forest relations, in the area. Case-study communities were chosen randomly from a stratified sample. We stratified communities within the sample frame on the basis of their socioeconomic well-being score in 1990, using three categories—high, medium, and low—and randomly chose one community from each stratum. This enabled us to examine how communities characterized as having high, medium, and low well-being responded to changes in forest management policy.

Once we selected the case-study communities randomly, we visited them and talked with community members to determine whether the community did indeed

[2] The socioeconomic well-being index consists of six measures: employment by industry diversity, percentage of the population with bachelor's degree or higher, percentage of the population unemployed, percentage of the population in poverty, household income inequality, and average travel time to work (see Donoghue and Sutton 2006 for a description of methods used to develop the index).

have historical and present ties to the KNF. We also determined how the communities should be defined for case-study purposes. The community BGA delineations were used for initially selecting case communities on a random basis; however, the model we developed did not necessarily correspond geographically to the place that community members considered "their community." The BGA community delineations were starting points for defining study communities, but we adjusted those definitions according to how local residents conceptualized their community. In many cases, this meant further aggregating the original, randomly-chosen BGA with surrounding BGAs in response to feedback from local residents to ultimately define the case-study community boundaries.

Initially, Dorris was randomly chosen as the BGA having low well-being, the Klamath River-Horse Creek-Seiad Valley BGA was randomly chosen as the medium well-being community, and Etna-Greenview was the BGA randomly chosen as having high well-being. Once we got to the field, we determined through discussions with local residents that we should expand our definition of "community" to be more consistent with their concept of community. Hence the Dorris community expanded to encompass Butte Valley, Etna-Greenview expanded to include Scott Valley and the Sawyer's Bar area of the Salmon River, and the Klamath River-Horse Creek-Seiad Valley community extended to encompass Happy Camp. Merging additional census block groups with the ones initially chosen on a random basis caused the 1990 socioeconomic well-being rating of the Scott Valley community to drop from high to medium. The three communities are geographically dispersed around the forest, and capture a range of variation found in forest-based communities associated with the KNF. We cannot say that this case-study report contains every point of view, or represents the full spectrum of impact and change that communities around the KNF experienced since the Northwest Forest Plan was implemented. However, we believe that our sample of communities does a good job of characterizing this range of experience.

We selected interviewees purposefully, rather than randomly, because we wanted to interview local experts who could provide information relevant to the monitoring questions posed in the ROD. We chose interviewees to capture as much of the potential range of variation in the populations under study as was feasible given funding and time constraints. We interviewed 14 community members in Butte Valley, 25 in Scott Valley, and 23 in the mid-Klamath area. Not all interviewees were residents of the communities. Some interviewees were individuals who worked in the community or had a strong connection to either the community or the portion of the KNF that surrounded the community.

After identifying categories of informants to be interviewed in each community and on the KNF, we used a snowball sampling approach to locate interviewees. Snowball sampling is an effective method of building a sampling frame when there is a relatively small population of people who know of and come into contact with one another (Bernard 2002), as was the case in this study. Snowball sampling entailed locating key individuals in each community, and asking them to identify people who would be appropriate to interview about the topics under study. The criteria we used to develop our sample frame included people who represented one of the informant categories we were interested in (app. B), people who had lived in the community or worked on the KNF at least since 1994 when the Plan was adopted, people who were knowledgeable about the topics under study, people who were knowledgeable about the community or the KNF, and people who were willing to talk with us. The team gathered names of potential interviewees and contacted those people whose names were repeatedly mentioned to set up an interview time and location. We conducted semistructured interviews using an interview guide that contained a list of questions and topics to be covered during the interview.

Three key limitations of the study include (1) We did not design this study with the objective of testing specific causal hypotheses relating to the monitoring trends, or to the effects of forest management policy on local communities. Rather, we conducted this study to develop an indepth, contextualized understanding of the effects of agency management actions, policies, and programs on forest-based

communities in different locations. As such, the case-study findings cannot be used (nor were they intended to be used) as the basis for making generalized statements about socioeconomic changes and the ways in which those may have been affected by the Plan to the entire universe of communities located around the KNF. (2) Because most of the people we interviewed have lived in and around the three case-study communities at least since the early 1990s, our findings tend to privilege the perceptions of long-term members of these particular communities of place, over the perceptions of other citizens (e.g., members of more distant communities of place who may, nonetheless, have been affected by the Plan, and people who recently moved to the communities). (3) With limited time to conduct the study, we had to substantially narrow the range of stakeholders included in the study. We sought to address this shortcoming by selecting some interviewees occupying work or leadership positions that brought them into close contact with a broad range of community members. For example, chamber of commerce and economic development employees could reasonably be expected to be familiar with how a range of business and services sectors in the community were affected by the Plan. Similarly, county and municipal politicians, tribal council members, and social service providers would likely have knowledge about diverse population subgroups, and the impacts that the Plan had on these groups.

The Klamath National Forest

The Klamath National Forest, approximately 1.7 million acres, is located in northern California just below the Oregon border, between the Six Rivers National Forest to the west, the Modoc National Forest to the east, and the Shasta-Trinity National Forest to the south. The east and west sides of the forest are separated by the Interstate-5 freeway. The central area of the KNF has a large component of dry mixed-conifer forest. To the west are more moist Douglas-fir forests. To the east are pine/mixed-conifer forests that are typical of the Cascade Mountain range. Fire plays an important role in these ecosystems. Large fires occurred on the forest in 1977, 1987, and 1994. The forest falls almost entirely within Siskiyou County (98 percent), with the remaining 2 percent in Jackson County, Oregon. In some places, there are large areas of checkerboard ownerships composed of mixed public and private land. The KNF has four ranger districts: Happy Camp, Goosenest, Salmon, and Scott.

The Northwest Forest Plan caused national forests in the Plan area to incorporate seven land allocation categories (which could overlap) into their forest plans, each with its own set of management standards and guidelines (USDA and USDI 1994). Congressionally reserved areas (such as wilderness areas and wild and scenic rivers) are reserved by acts of Congress for specific purposes, and the Plan did not alter any of these allocations. The KNF has 381,100 acres allocated to wilderness (USDA FS 1994b). Late-successional reserves were established by the Plan to maintain late-successional and old-growth forest ecosystems and to provide habitat for older forest-dependent species. The KNF contains 396,600 acres allocated to late-successional reserves. Riparian reserves are areas along streams, wetlands, ponds, lakes, and other areas where the conservation of aquatic and riparian-dependent terrestrial resources receives the primary emphasis; they are designed to protect the health of aquatic ecosystems and riparian habitat. In 1994, 458,000 acres of the KNF were allocated to riparian reserves. Adaptive management areas were designed to develop and test new approaches to forest management, and to integrate ecological, economic, and social management objectives. The KNF contains the 161,500-acre Goosenest Adaptive Management Area on the east side. Managed late-successional areas are areas delineated for known northern spotted owl activity centers, or to provide protection buffers for certain rare and locally-endemic species. Administratively withdrawn areas are areas not scheduled for timber harvest because they have been withdrawn in forest plans for purposes such as recreational, visual, or backcountry areas. Matrix lands, also referred to as general forest, lie outside of forest areas having one of the six allocations listed above, and areas having other special management designations as allocated by the KNF Land and Resource Management Plan (USDA FS 1994b). Most timber harvest

and other silvicultural activities were to be conducted in matrix lands, although not all of the matrix lands are technically suitable for timber production (USDA and USDI 1994). Plan standards and guidelines associated with the land-use allocations have the potential to affect resource and recreation activities there.

In area, Siskiyou County is the fifth largest county in California. Yreka is the largest service center in Siskiyou County and is its county seat. Services there include banks, social services, shopping, medical services, and other amenities. Siskiyou County has one of the state's lowest population densities. This is partly because over 60 percent of Siskiyou County is in public ownership. The county is one of the most remote in the Plan area with regard to distance from major metropolitan areas. There are only nine incorporated towns in the entire county. The rest of the communities are unincorporated, and typically have community service districts and volunteer fire departments to supply basic services. Some communities are very isolated and completely surrounded by KNF lands.

Timber was formerly a dominant presence in the regional job economy: 31 percent of all employment in Plan area counties in northern California in the early 1970s was in timber. Timber remained a significant employer through the 1980s, although by the late 1980s, the relative importance of timber employment had declined by 50 percent (FEMAT 1993: VII-53). Detailed descriptions of the case-study communities appear in chapter 3 of this report.

Chapter 2: Trends in Socioeconomic Benefits From the Klamath National Forest, 1990–2003

This chapter focuses on trends in socioeconomic benefits from the Klamath National Forest (KNF) during the first decade of the Northwest Forest Plan (the Plan). We define these benefits broadly to include timber, nontimber, and recreation resources produced on the KNF, Forest Service jobs, procurement contracts for ecosystem management work, community economic assistance funds, and payments to county governments. Not only do we document trends in the benefits produced, we discuss the underlying causes of the trends, including the role of the Plan in influencing them, by providing data from interviews with KNF employees. This information addresses the Plan goal, to produce a predictable and sustainable supply of timber sales, nontimber resources, and recreation opportunities. It also provides the data needed to evaluate how the Plan contributed to maintaining the stability of local and regional economies and in assisting with long-term economic development and diversification in communities affected by cutbacks in timber harvesting.

Timber, Nontimber Forest Products, and Recreation

One of the socioeconomic goals of the Northwest Forest Plan was to produce a predictable and sustainable level of timber sales and nontimber resources from federal forest lands that will not degrade or destroy the environment (USDA and USDI 1994). Consistent with this goal, one of the evaluation questions posed in the Northwest Forest Plan Record of Decision (ROD) was, Are predictable levels of timber and nontimber resources available and being produced? (USDA and USDI 1994: E-9). To answer this question, the ROD specifies that timber harvest levels, special forest products, livestock grazing, mineral extraction, recreation, scenic quality, and commercial fishing be monitored. We did not monitor scenic quality because data were lacking. Scenery inventories were conducted when the first Klamath National Forest Land and Resource Management Plan was developed (USDA FS 1994b); but these have not been updated, so it is not possible to assess change over time. We did not monitor commercial fishing because commercial fishing is not permitted on the KNF except by tribes; furthermore, commercial fishing is affected by a broad range of factors, making it impossible to meaningfully evaluate how the Plan affected it. The Northwest Forest Plan Aquatic and Riparian Effectiveness Monitoring Program monitors watershed condition, an indicator of fish habitat.

This chapter contains monitoring data for the five other resource areas. The following sections examine whether predictable levels of timber and nontimber resources and recreation opportunities have been produced on the KNF since 1990, the baseline year for the monitoring program. We present quantitative monitoring data obtained from Forest Service databases for each resource area, and use qualitative interview data from KNF employees to gain insight into how Plan implementation and other variables influenced trends in these data.

Timber

Much of the public discussion about whether the Plan met its socioeconomic goals during the first decade focused on the issue of timber production. The Plan identified matrix lands and adaptive management areas as containing lands suitable for producing a predictable and sustainable supply of timber. Predictability in supply would be achieved by offering timber sales at the estimated probable sale quantities (the same as the allowable sale quantity, or ASQ, in the case of the KNF). The ASQ is the maximum amount of timber that may be programmed for harvest from land capable, available, and suitable for timber management during a decade, expressed as an estimated annual average. A second objective for timber harvest under the Plan was to use it as a tool for managing vegetation to achieve ecosystem management objectives, such as promoting development of late-successional and old-growth (older forest) habitat in late-successional and riparian reserves.

The KNF was once one of the highest timber-producing forests in California (USDA FS 1994a: 3-114). The forest produced an average of roughly 200 million board feet of timber annually between 1979 and 1989. Timber production rose steadily during the 1980s, peaking at around 300

million board feet just prior to the northern spotted owl (*Strix occidentalis caurina*) listing in 1990 (fig. 3). A major complex of fires occurred on the forest in 1987, and salvage logging associated with those fires continued into the early 1990s. This meant that the initial dropoff in timber harvest caused by court injunctions that halted the flow of federal timber after the owl listing was less abrupt on the KNF than it was on other Plan-area forests.

Since Plan implementation, commercial timber production has been a central management objective on forest lands classified as matrix and in the Goosenest Adaptive Management Area, together constituting 423,500 acres or approximately 25 percent of the forest. The KNF ASQ was estimated at 51 million board feet per year (USDA FS 1995). Commercial timber harvest from other parts of the forest may occur as a byproduct of forest management activities that take place to promote ecosystem health objectives. An additional estimated 20 million board feet was anticipated to be harvested each year from other lands to help maintain ecosystem health (USDA FS 1995).

Monitoring question—During the first decade of the Plan, did the Klamath National Forest produce the ASQ volumes anticipated?

The Forest Service creates corporate timber-volume reports in three ways: volume of timber offered for sale, volume of timber sold, and volume of timber harvested. Volume offered is the amount of timber that the federal agencies make available for sale in a given fiscal year. Not all timber sales that agencies offer are purchased; volume of timber sold represents the timber that actually receives a bid from a qualified purchaser. Once sales are awarded, they generally take 2 to 3 years to harvest. As a result, the volumes sold and harvested in a given year are rarely the same. We used volume of timber offered for sale as an indicator of production by the KNF. Volume offered measures all volume made available for sale by the forest, including volume offered from late-successional and riparian reserves, and volume not meeting forest utilization standards. The ASQ volume refers to the timber offered for sale only from matrix lands and adaptive management areas. We did not make this calculation for this report

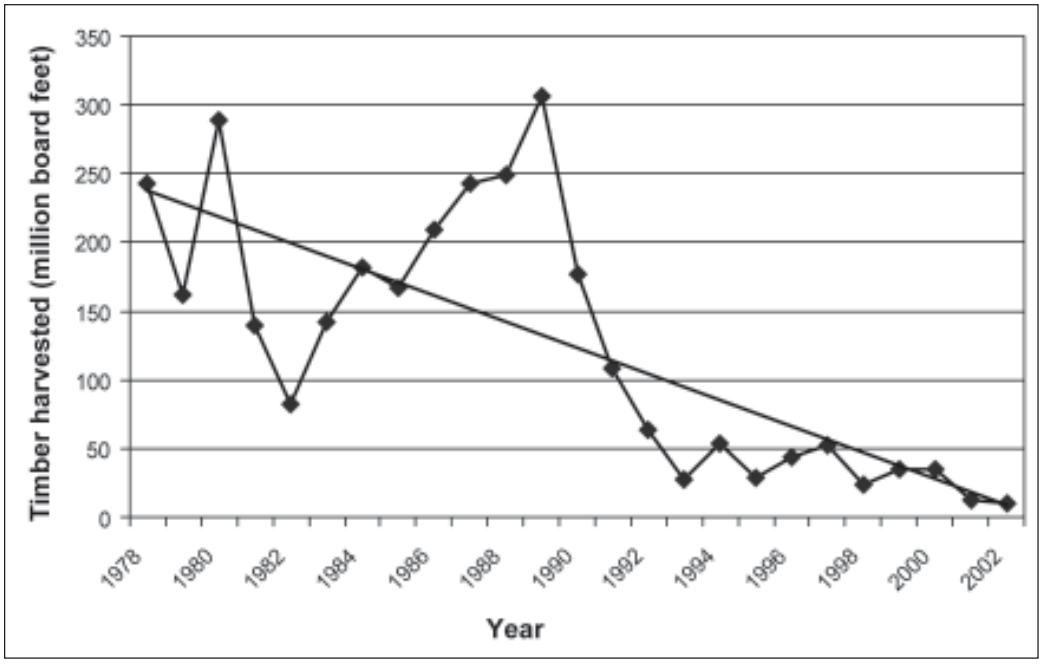


Figure 3—Volume of timber harvested on the Klamath National Forest, 1978–2002. Source: National Forest Service cut and sold reports.

because the Forest Service Pacific Southwest Region (Region 5) office only recorded timber harvest by land-use allocation for the years 1995 to 2000.

The average annual volume of timber offered for sale by the KNF between 1995 and 2002 was 34 million board feet. The total volume of timber offered for sale reached the ASQ of 51 million board feet twice after 1994 (in 1996 and 1997) (fig. 4), although actual ASQ volume is somewhat less than the total volume offered for sale. Since the Plan has been in effect, timber harvest on the KNF has steadily declined. Historically, the west side of the Klamath produced most of the timber; the majority of the cut now comes from the east side of the forest. Currently, most commercial timber sales consist of thinning projects.

The KNF did not produce the ASQ volumes anticipated under the Plan, and the Plan and processes associated with it had a major impact on the forest's timber program. Forest interviewees cited many reasons for this failure, which are detailed below.

Availability—
The land-use allocation system established under the Plan reduced the forest land base that could be managed for commercial timber production because of the late-successional reserve and riparian-reserve system. Of the matrix lands initially available for commercial timber harvest, many were subject to subsequent executive, legislative, and judicial constraints (such as roadless areas). These additional constraints affected the land base available for commercial timber production.

Harvest methods—
The Northwest Forest Plan and the Klamath Forest Plan call for most commercial timber production on the forest to use regeneration harvests with green-tree retention on small areas as a tool to achieve several multiple-use goals. These goals included promoting healthy ecosystems, provisions for resilience to fire and disease, as well as wildlife and scenery. Focusing intensive harvest practices in small areas minimizes ground disturbance, and therefore minimizes the area subject to survey-and-manage species needs and other procedural requirements. Some interest groups, however, viewed regeneration harvesting negatively because it is similar to clearcutting. They appealed or litigated timber sales that included this method. Consequently, most timber production on the KNF has been the result of thinning,

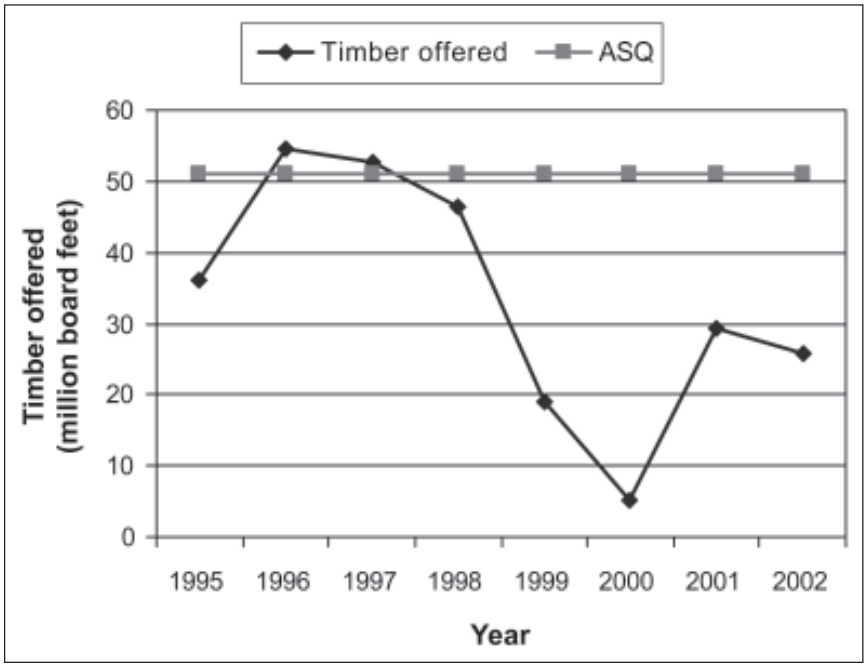


Figure 4—Volume of timber offered for sale vs. allowable sale quantity (ASQ), 1995–2002. Note: The volume of timber offered for sale includes ASQ volume (from matrix and adaptive management areas) and volume offered from other land use allocations.

which is extensive rather than intensive. Thinning only produces 10 to 30 percent of the yield per acre that regeneration harvest does (Barber 2004). Consequently, more acres had to be treated for the same volume, meaning that more area had to be examined for survey-and-manage species, leading to lower relative outputs.

Survey and manage—
The Plan had several requirements that called for new procedural processes associated with ground-disturbing activities, including timber harvest. These needs added to an already existing set of requirements that had to be followed when timber sales were undertaken. One of the most onerous of these on the KNF was for the survey-and-manage species. The KNF is the second most biodiverse national forest in the United States (USDA FS 1994b). Survey-and-manage procedures began to be implemented on the Klamath in 1996, and by 1998, up to 60 species had to be surveyed for and managed. The cost and timing requirements of the surveys, and the amount of time required to meet the procedural requirements, were a deterrent to producing timely timber sales. Furthermore, the presence of survey-and-manage species on the forest imposed harvest restrictions in some areas, further reducing the land base available for timber sales. Survey and manage needs also added difficulty to producing timber from areas of the forest affected by fire, blowdown, and drought-related mortality. Getting through the procedural requirements associated with timber sales took so long that once they were completed the products no longer had commercial value. One of the reasons that timber harvest from the forest shifted from the west to the east side was that fewer survey-and-manage species lived there.

Economics—
Most commercial timber sales on the KNF were originally expected to be in matrix lands. Instead, most commercial timber production on the forest occurred to promote ecosystem management objectives. The timber produced usually had relatively low economic value. Timber sales were expensive to prepare because of the analytical and procedural requirements the forest had to follow. It cost from $35 to $115 per acre to survey for survey-and-manage species, raising the unit cost of the timber program substantially. Sometimes the result was uneconomical sales that timber industry purchasers would not buy; imported wood was often cheaper. Added to this, the number of buyers dwindled because of the dramatic loss of timber-industry infrastructure in Siskiyou County since 1990. Those who remained developed suppliers of wood more reliable than the national forests. Because these buyers no longer depended on federal forests for their supply, they only bought timber sales offered for a good price.

Interviewees stated that before the Plan was adopted, 35 percent of the costs of a timber sale were associated with its planning, and 65 percent were related to timber-sale preparation. Since the Plan was adopted, 70 percent of the costs have been for planning, and 30 percent for timber-sale preparation. As described above, the heavy burden of procedural requirements resulted in decreased outputs, making the per-unit cost of timber output on the KNF higher than on non-Plan-area national forests in California. The KNF timber-sale program has been costing more than the revenue since 1999. This shortcoming in economic efficiency, combined with a regional climate of tightening budgets and a change in administration, has in recent years caused the Forest Service to redirect timber-program money that once went to the KNF to other, non-Plan-area forests where it can "get more bang for the buck." Declines in both the KNF budget and staff numbers added to this problem. Having a smaller timber program budget on the KNF made it harder to produce the expected volumes.

Appeals and litigation—
Because the Plan has so many extensive and complex procedural requirements associated with timber harvest, people can find ways of opposing sales because many grounds are available on which to file appeals or lawsuits. For example, some members of the public found commercial logging, regeneration harvesting, and harvesting old growth on federal lands unacceptable, leading to litigation and appeals. Local environmental groups are

particularly opposed to sales that included old-growth trees, that were in key watersheds, or that were on steep slopes. Appeals and lawsuits have stopped several timber sales on the KNF.

Risk aversion—
Under the Plan, commercial timber harvest on the KNF has been more highly scrutinized by some stakeholders, and become more politically sensitive. Because the procedural requirements associated with timber sales are so expensive and time-consuming, decisionmakers have been reluctant to propose sales with a high risk of appeal.

Unrealistic targets—
Representatives of the Klamath Forest Alliance interviewed for this study–perhaps the most active local environmental group–believed that the timber targets set for the KNF were unrealistically high, which is one reason the ASQ has not been met under the Plan. Old-growth trees have been included in timber sales to help meet ASQ, and environmental groups oppose cutting old growth. These representatives believe that ASQ cannot be met on the KNF without degrading old-growth and aquatic ecosystems, which their group opposes. They are willing to use appeals or lawsuits to stop such sales.

Factors unrelated to the Plan—
Interviewees also cited requirements imposed by other legislation, such as the Endangered Species Act and the Clean Water Act, as contributing to the fact that the KNF did not produce the ASQ volumes anticipated during the first decade of the Plan.

Special Forest Products

Fuelwood, Christmas trees, and mushrooms are the most widely harvested special forest products on the KNF. Fuelwood was an important resource throughout the study period because many local residents rely on wood heat, although this dependence has declined in recent years. Matsutake mushrooms (*Tricholoma magnivelare*) are the primary mushroom species harvested because of their high commercial value. These mushrooms are picked in the fall. There are also several special forest product species of importance to local tribes. On the west side of the forest, these include materials used by the Karuk in basket making (e.g., beargrass [*Xerophyllum tenax* (Pursh) Nutt.], hazel [*Corylus cornuta* Marsh.], willow [*Salix* spp.], *Woodwardia* ferns, acorns, matsutake, alder [*Alnus* spp.] bark, and buckbrush [*Ceanothus* spp.]). On the east side of the forest, mushrooms and wild celery (*Apium graveolens* L.) were identified as being important to the Shasta Tribe.

Monitoring question—Have predictable levels of special forest products been produced on the Klamath National Forest under the Northwest Forest Plan?

The Forest Service tracks data relating to special forest products in a database called the Automated Timber Sale Accounting System. These data come from permits and contracts that the agency issues to allow members of the public to harvest special forest products on Forest Service-managed lands. Three measures are tracked in the database: quantity of product sold, value of product sold, and number of permits issued for each product. We used the quantity of product sold as the best monitoring indicator.

Quantity of product sold has limitations as an indicator, however. The quantity sold is not necessarily the same as the amount actually harvested. It refers to the maximum amount of harvest permissible under a permit and is based on agency estimates of the amount people will harvest during the life of the permit. Not all harvesters obtain permits, in spite of regulatory requirements. Agency data do not reflect harvest activity by people without permits, which could be substantial.

Products such as fuelwood, Christmas trees, and poles and posts that can be measured in units that relate to dimension lumber (board feet, linear feet, cubic feet, cords)[1]

[1] Conversion factors for poles and posts: 1,000 board feet (mbf) log scale = 200 cubic feet (cf) or 5.625 tons; for fuelwood: 1 mbf = 2.5 cords, 1 cord (stack of wood 4 feet by 4 feet by 8 feet) = 80 cubic feet or 2.25 tons; for Christmas trees: one Christmas tree = 7 linear feet or 1.5 board feet or 0.3 cubic feet or 16.9 pounds.

are called convertible products. Those products that cannot be measured in such terms are called nonconvertible products. Before 1996, the Forest Service did not track data relating to nonconvertible products by product category; they were lumped into one category: nonconvertibles. Thus, we could not track the quantity of individual nonconvertible products sold for the years before 1996. Our analysis of KNF data for nonconvertibles begins in 1996 and continues through 2002, the most recent year for which we were able to obtain data. Convertible products were tracked by product category prior to 1996. Our analysis of trends in fuelwood, poles and posts, and Christmas trees sold begins with 1990. All of the data are reported here by calendar year.

Figures 5 and 6 indicate that the quantity of fuelwood and Christmas trees sold on the KNF declined since 1990. The number of Christmas trees sold varied widely prior to 1996. Whether this reflects inaccuracies in the data is unknown. Since 1998, the quantity of Christmas trees sold has stabilized, although at a level far below what it was prior to 1996. The quantity of poles and posts sold fluctuated annually, with an overall slight upward trend (fig. 7). A special order or project can have a big impact on the quantity of poles and posts sold in a given year.

For nonconvertibles, only the quantity of mushrooms sold increased substantially during the study period (fig. 8). Commercial mushroom harvest levels can vary widely from year to year depending on weather, environmental conditions, market prices, and market demand. Matsutake harvesting on the KNF rose dramatically in the early to mid-1990s in response to growth in market demand (Everett 2007). Butte Valley and the Mid-Klamath both became important mushroom harvesting and selling areas, with the income earned providing a supplement for some local residents. Harvesting fell in the late 1990s, however, because of declines in market prices and in production levels on the forest (Everett 2007). The dramatic rise in the quantity of mushrooms sold on the KNF in the early 2000s is probably due to a rebound in matsutake harvesting. Other products harvested on the forest for which there are reportable data are limbs and boughs (fig. 9) and cones (fig. 10). The amount of limbs, boughs, and cones sold fluctuated annually, with a downward trend overall for limbs and boughs. Cone production is more subject to variation in ecological conditions than that of limbs and boughs. All are subject to variation in market demand and pricing.

Overall, the number of special forest product permits sold to members of the pubic by the KNF declined steadily (fig. 11). The forest received roughly half the number of requests for special forest products permits in 2002 that it did in 1997. Although there was also a decline in the amount of money the KNF earned from selling special forest products permits (fig. 12), the value of permits sold did not decline as steeply as the number did. These trends do not necessarily signify a decrease in the supply of special forest products on KNF lands. However, opportunities to obtain some products have declined.

Many factors influence availability and harvest activity of special forest products. These factors include changes in harvest opportunities and changes in demand for products by harvesters. Both affect trends in sales of special forest products by the agencies.

Special forest products harvesting became more restrictive under the Plan because it limited areas of the forest where some products could be collected. For example, harvesting in late-successional reserves and riparian reserves must be consistent with the management objectives of the reserves, and may be restricted. Fuelwood cutting is restricted in late-successional reserves and riparian reserves. The fuelwood program on the KNF was linked to the timber program. Fuelwood was often taken from places recently harvested for timber sales. The reduction in timber sales on the KNF has undoubtedly caused fuelwood cutting to decline as well. In the past, commercial fuelwood extraction was an important economic activity on the forest. Unrelated to the Plan, in the last few years administrative requirements changed, so that commercial fuelwood production now takes place under a timber sale contract. This may impose administrative difficulties for people, leading to fewer sales. Finally, demand for fuelwood has likely decreased because many people have shifted from wood-burning stoves to other heating systems.

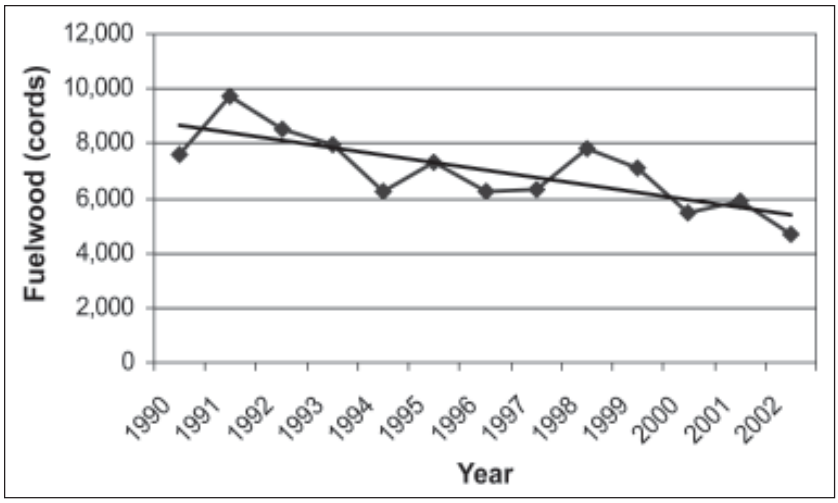


Figure 5—Volume of fuelwood sold, Klamath National Forest, 1990–2002.

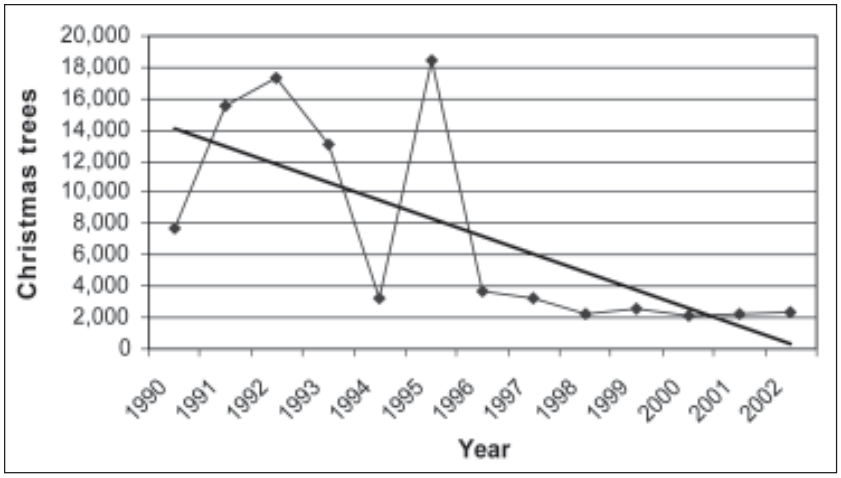


Figure 6—Number of Christmas trees sold, Klamath National Forest, 1990–2002.

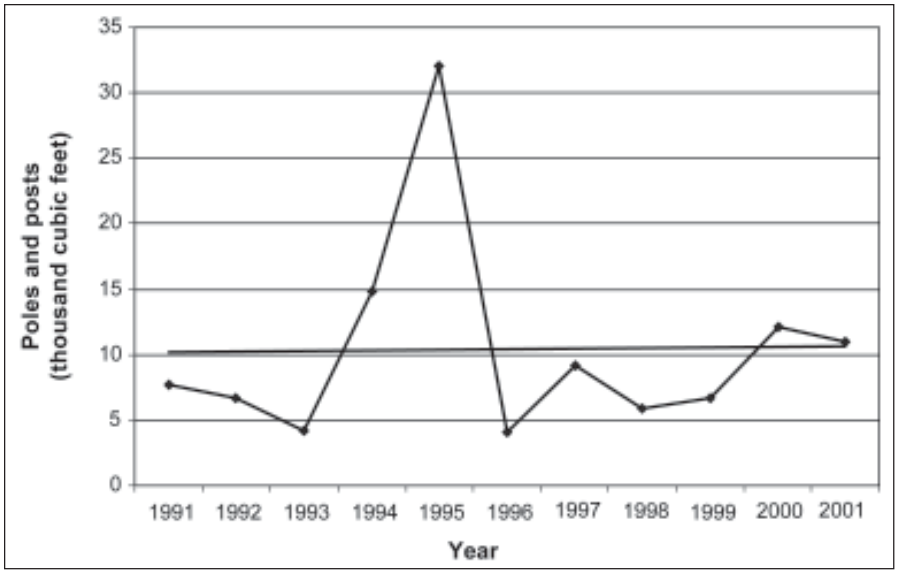


Figure 7—Volume of poles and posts sold, Klamath National Forest, 1990–2002. Anomalous data from 1990 and 2002 were excluded because of suspected data entry error.

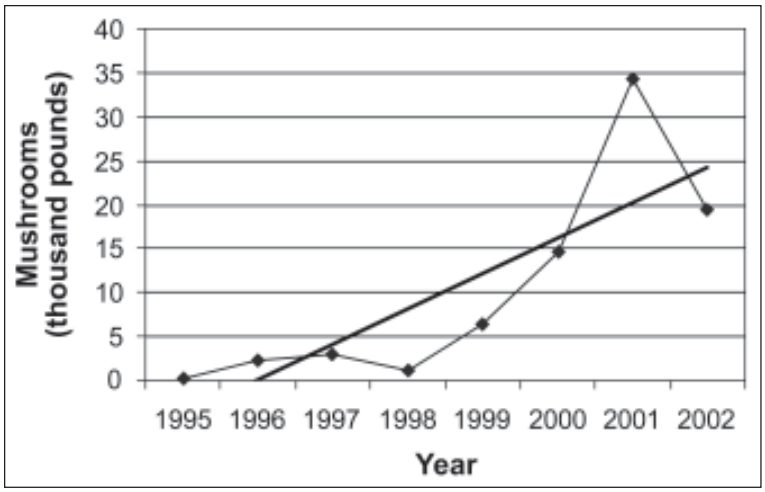


Figure 8—Quantity of mushrooms sold, Klamath National Forest, 1995–2002.

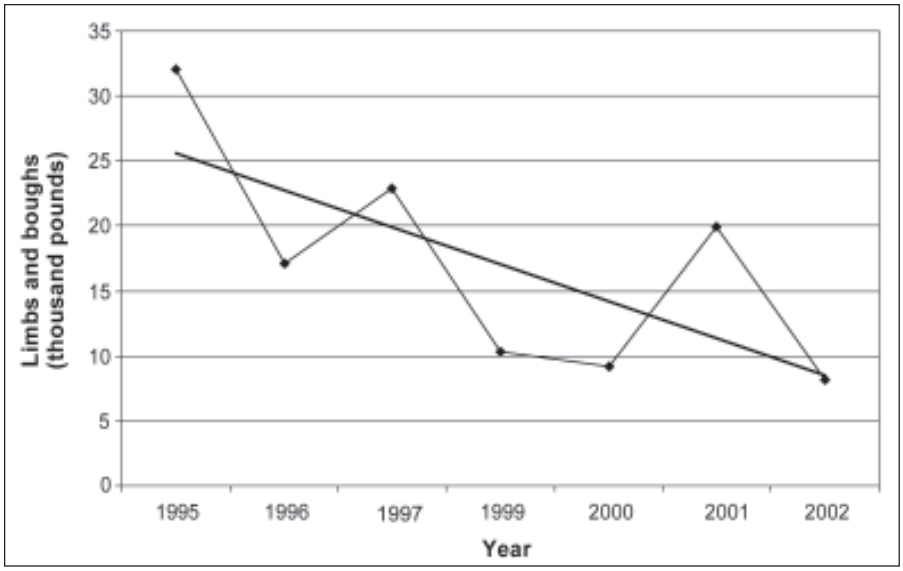


Figure 9—Quantity of limbs and boughs sold, Klamath National Forest, 1995–2002. Note: Excludes anomalous data from the year 1998 because of suspected data entry error.

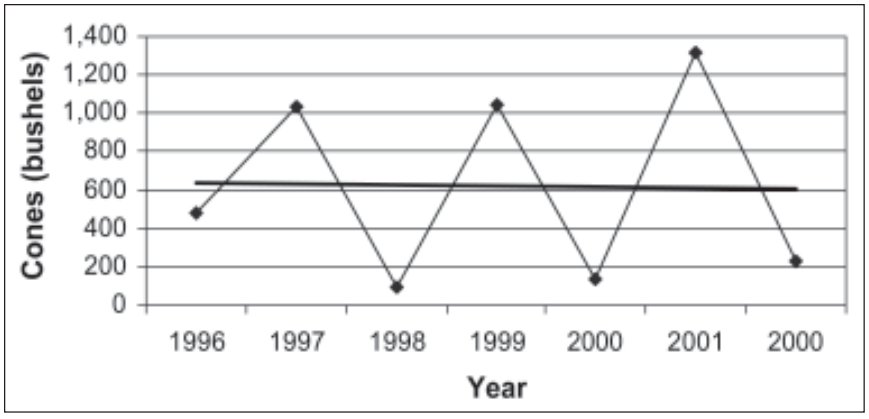


Figure 10—Quantity of dry and green cones sold, Klamath National Forest, 1996–2002.

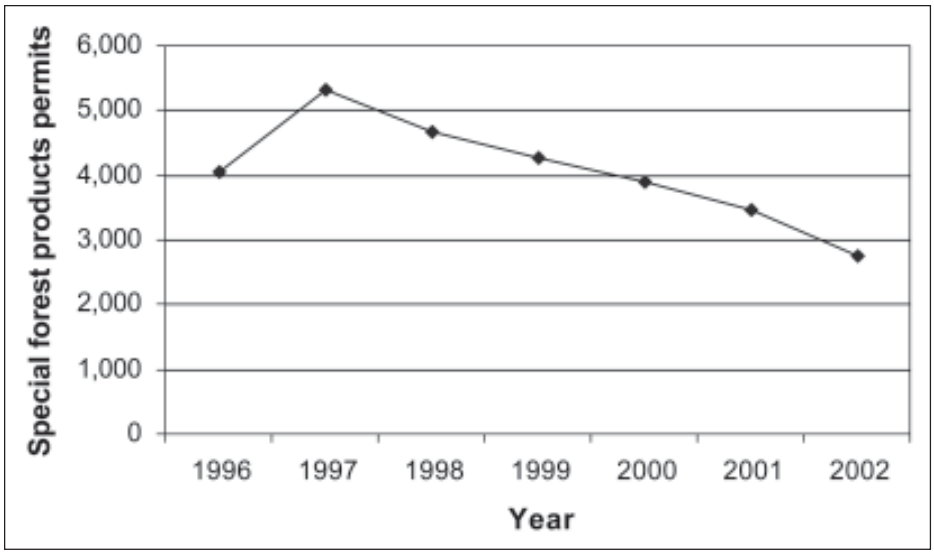


Figure 11—Total number of special forest products permits sold, Klamath National Forest, 1996–2002.

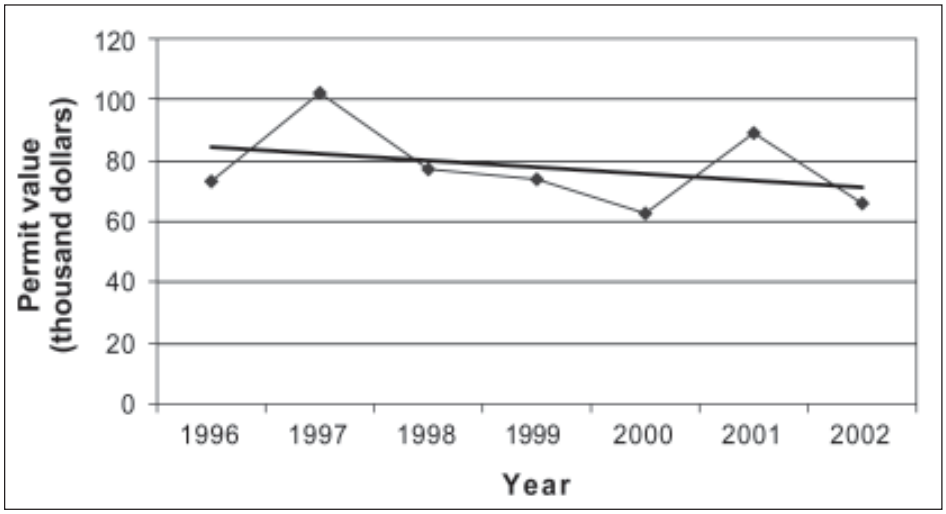


Figure 12—Total value of special forest product permits sold, Klamath National Forest, 1996–2002.

In addition to constraints imposed by the Plan, some interviewees commented that road closures on the KNF have limited access to some places, making it harder to gather special forest products there (see the "Recreation" section for a discussion of the links between road closures and the Plan).

Changing habitat conditions on forests also affect product availability. For example, fire suppression policies may negatively affect species (like beargrass) that thrive in burned areas or are associated with early-seral forests. In contrast, many commercially valuable floral greens prefer mid- to late-seral forests and semiclosed canopies, which are favored under the Plan (FEMAT 1993: VI-12).

The Plan also affected the gathering of special forest products by the Karuk Tribe. Karuk tribal members interviewed stated that their ability to gather special forest products has declined over the past decade. Some of these products—such as beargrass and hazel—thrive in areas that have burned or been disturbed. Burns also clear the forest floor, making it easier to find products such as acorns, slowing their rate of decomposition (acorns in areas with heavy understories are reportedly more insect-infested), and

making it easier to walk through the forest. The Karuk historically managed the forest with fire as an integral part of the ecosystem, and actively burned to encourage the growth of plants they found desirable (Blackburn and Anderson 1993, Stewart 2002). During the 20th century, fire suppression practiced by the Forest Service removed fire from the ecosystem, leading to ecological changes that have been unfavorable to some of the species having cultural importance to the Karuk. As a result, the Karuk have worked with the KNF to institute a cultural burning program. The KNF has been conducting underburns on small areas to encourage the growth of beargrass and other basketry materials. Under the Plan, Karuk interviewees reported, it was more difficult to conduct controlled burns because of constraints imposed by survey-and-manage requirements in particular. It has also been difficult to conduct controlled burns because of excessive fuel loads. There are relatively few areas that can be burned without prior fuel treatments.

Willows, another product important to the Karuk, grow along riverbanks. Supple young willow limbs are favored for basketry. Karuk interviewees reported that under the Aquatic Conservation Strategy, there may be restrictions on cutting willows along rivers and streams in riparian reserves. The Plan thus appears to have contributed to reduced access to and availability of some special forest products used for cultural purposes by the Karuk.

In sum, it is not possible to adequately assess whether predictable levels of special forest products were produced on the KNF under the Plan. Trends in the quantity of special forest products sold are affected by changes in harvest opportunities, and changes in harvester demand for special forest products from federal forests. Changes in harvester demand can be caused by shifts in market demand for the product, commodity prices, the availability of alternate supplies, and changing consumer preferences (for example, switching from wood stoves to electric or gas heaters to heat homes). Apparent changes in harvester demand may also be due to increased enforcement efforts. Increasing trends in the quantity of a product sold could reflect an increase in harvester numbers and activity, or an increase in the number of illegal harvesters opting to obtain permits (with little change in actual activity).

Because many variables influence trends in the quantity of special forest products sold on federal forest lands, quantity sold–although currently the best indicator for which data are available–does not by itself adequately reflect whether or not the KNF has been producing a predictable level of special forest products. All it can tell us is whether or not the KNF has been selling a predictable quantity of these products. Data indicate that the quantity of special forest products sold by the KNF has been mixed since the Plan was implemented, differing by product.

Grazing

The grazing program on the KNF is small, but it is one of the largest in Region 5, and it is the largest grazing program of the four northern California forests in the Plan area. The program goals are to provide forage on a sustainable basis to meet livestock forage allocations and the needs of big game species on the forest, to maintain a healthy ecosystem, and to implement grazing in a manner that is consistent with the Aquatic Conservation Strategy (USDA FS 2005). On the west side of the KNF, grazing occurs mainly in mountain meadows and is fairly extensive (USDA FS 1994a: 3-122–3-123). On the east side of the forest, grazing is practiced more intensively and occurs mainly in sagebrush-steppe and montane browse habitats. The forest's chaparral habitats also provide livestock forage. The KNF permits cattle and horse grazing only. In general, cattle start grazing on the forest in late spring or early summer, and are removed in late summer or early fall, depending on range conditions.

Monitoring question—Have predictable levels of livestock grazing been produced under the Northwest Forest Plan?

The number of grazing allotments, allotment acres, permittees, and animal unit months (AUMs) are potential indicators of livestock grazing on national forest lands. We used all of these indicators to monitor grazing on the KNF. The Forest Service tracks the number and acres of active and vacant grazing allotments. We used number of active allotments and number of active allotment acres as monitoring indicators. Allotments currently vacant were not

included, as most are being phased out. A grazing permittee is any entity that has a grazing permit for one or more allotments, such as an individual or a cooperative with several members (Forest Service Manual [FSM] 2230.5). The AUMs are an indicator of range use. One AUM equals the amount of forage a mature cow (of 1,000 pounds) and calf consume in a 30-day period (about 780 pounds of dry weight) (Mitchell 2000: 64–65). We used data for authorized use (as opposed to permitted use). Authorized use can fluctuate annually, depending on forage supply, special restrictions, and other variables. Authorized use is specified on the annual bill of collection, and verified by a permittee's payment of fees. It represents the amount of use authorized by the forest for that year.

Our grazing data came from the Northwest Forest Plan 10-year implementation monitoring report (Baker et al. 2006) and from the KNF. Data in the report came from agency databases (INFRA and RAS), annual agency accomplishment reports, and personal interviews with agency specialists. The data are for two periods: 1994 and 2002.

Table 1 displays grazing data for the KNF from two periods to compare the grazing program at the time the Plan was adopted with more recent grazing. Earlier data were considered unreliable. Grazing on the KNF remained relatively stable between 1994 and 2002. There was a small increase in the number of active allotments and allotment acres, and a small decrease in the number of permittees and authorized AUMs. The program manager reported little change in the grazing program and minor effects from the Plan. The drop in the number of permittees could be due to a consolidation of permits. When allotments and their associated permits become open, other existing permittees often take over the permits. As a result, the number of allotments remains the same, but the number of permittees decreases. Figure 13 shows that the value of collection receipts generated by grazing on the KNF has declined.

Managers on the KNF attributed the 15-percent decline in authorized AUMs primarily to the prolonged drought the area has experienced on the west side of the forest. The Plan has had some effects, however. Under the Plan, grazing practices must be consistent with the Aquatic Conservation Strategy. This has meant reviewing and sometimes imposing restrictions on grazing in riparian areas. For example, cattle may not be allowed to enter riparian areas until the ground has fully dried in late spring, and must be removed before they overgraze, which shortens the use period. The Plan also reportedly caused the NEPA (National Environmental Policy Act) analysis associated with permit renewal to become more rigorous. In short, since the Plan went into effect, the forest has increased its scrutiny over the impact of livestock on the forest, particularly in riparian areas, and made some adjustments. The drought has been a big factor, with shrinking water sources that require increasing protection and cattle management. The overall effects are small, incremental declines in forage availability and increased requirements for permittees.

Survey-and-manage requirements associated with the renewal of grazing permits under the Plan were not seen as having an effect on grazing, but the Endangered Species Act was viewed as having the potential to affect grazing. Grazing in late-successional reserves still occurs, but has been adjusted for location and timing so as to minimize ecological impacts, also shortening the season and reducing the number of animals.

After drought, the second largest factor that managers reported as contributing to reduced forage availability on the KNF was the dramatic reduction in timber program activity incorporated into policy with the Plan. This has resulted in much less early-seral-stage forest habitat that is productive for grazing.

All of these forces have contributed to a small decline in the grazing program on the KNF since 1994. Overall, the program is viewed as relatively stable with little turnover in permittees and good relations between managers and ranchers. Interviewees said grazing outside the reserves does not currently conflict with management objectives, so little has changed there.

Table 1—Grazing on the Klamath National Forest, 1994 and 2002

Year	Active allotments	Active allotment	Permittees	Authorized AUMs
		Acres		
1994	51	707,369	52	29,134
2002	55	759,330	42	24,630

AUM = animal unit month.

Sources: These data are from the Northwest Forest Plan Implementation Monitoring Module (Baker et al. 2006), except for the number of permittees in 1994. This number is an estimate based on information provided by the forest grazing program specialist, who considered the INFRA data and the data reported in USDA FS 1994a regarding permittees to be inaccurate.

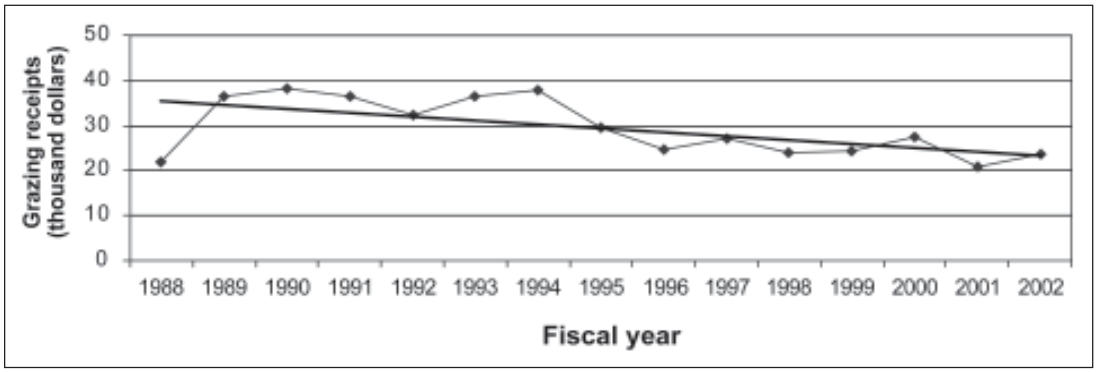


Figure 13—Klamath National Forest collection receipts, grazing, 1988–2002. Source: Annual USDA Forest Service all service receipts ASR-10-3 reports.

Minerals

The goal of the KNF minerals program is to manage mineral exploration and development of surface resources in a manner that maintains environmental quality (USDA FS 2005). The east side of the KNF contains leasable minerals and has the potential for oil, gas, and geothermal development (USDA FS 1994a: 3-100). The west side of the forest contains locatable minerals, most notably gold. Salable minerals are also mainly found on the west side, and include common varieties of rock, gravel, sand, and stone. There is a small amount of commercial minerals production on the forest by small-scale miners, and a growing number of recreational miners are dredging for gold along the Klamath, Scott, and Salmon Rivers. Both groups use suction dredges. Prospecting and mining on the KNF are for the most part unrestricted, although subject to mitigation and reclamation to minimize environmental impacts where there is surface disturbance (USDA FS 1994a: 3-100–3-101).

Monitoring question—Have predictable levels of minerals been produced on the Klamath National Forest under the Plan?

Finding good indicators for mining proved challenging. The indicators differ by mineral class, as do the years for which data are available. The monitoring team used number of leases of record (leases) as an indicator of leasable minerals activity. The BLM is responsible for recording and issuing leases for leasable minerals. Leases are normally issued for a 10-year period. The Minerals Management Service tracks the production of leasable minerals. Data for the KNF were available for fiscal years 1990, 1995, and 2000.

The Forest Service does not track the volume of locatable minerals removed. This information is proprietary, and the government does not charge users any royalties or payments (other than income taxes) on the basis of volume removed (Gusey 2003). In the absence of production data, the best available indicators pertain to public participation in mining activity. Number of mining sites is one such indicator. However, many mining sites are abandoned, and agency databases do not distinguish between abandoned and active sites, making this a poor indicator. Instead, the team monitored the number of new mining claims located and the number of plans of operation approved each year. A mining-claim location may indicate a person's intent to mine in a given area. A plan of operation describes how a user intends to develop the mining site. The plan of operation must be approved before the user can start mining on a claim. The number of plans of operation submitted to a forest may be higher than the number approved. We do not know what percentage of plans submitted actually get approved. Total annual numbers of mining claims and plans of operation would be better monitoring indicators, but these data were not available.

Data for the number of new mining claims located were available for the years 1990–2003. Data for the number of new plans of operation approved were available for most years between 1995 and 2001.

Volume of salable minerals removed is the indicator used for salable minerals production. The Forest Service tracks three categories of use: Forest Service use, free use, and contract use. The Forest Service removes salable minerals mainly for road construction and reconstruction. The agency issues free-use permits to members of the public and government agencies. Users wishing to remove salable minerals for commercial purposes obtain contracts of sale. Data were available for the years 1994 to 2003.

For leasable minerals, the number of leases of record was constant throughout the monitoring period (43). Most of these leases are likely to be inactive (USDA FS 1994a: 3-102). No leasable minerals were produced during the monitoring period (Gusey 2004).

Locatable minerals activity can be highly variable, depending on market demand, global supply, and prices. On the KNF, the number of new mining claims declined overall during the monitoring period (fig. 14), although there has been a steady increase since 2000. The number of new plans of operation approved has been highly variable, with an overall declining trend (fig. 15). Recreational gold mining with suction dredges occurs on the KNF. The forest has experienced major growth in recreational mining since the late 1980s, when a recreational mining club established itself locally. The club has more than 60 miles of claims along the middle Klamath River and its tributaries. The recent rise in the number of new mining claims probably reflects growing recreational mining activity. Instream mining activity has been curtailed over the last decade, however, by the Endangered Species Act (1973) and state regulations that increased protection for anadromous fish, shortening the period in which suction dredge mining can take place.

The amount of salable minerals extracted from the KNF varied widely from year to year (table 2). Between 1985 and 1991, the average annual quantity of salable minerals extracted from the forest was 96,900 tons (USDA FS 1994a: 3-102–3-103). This was a drop from the average annual volume removed between 1978 and 1984, which was 264,000 tons. Since the Plan was implemented, much lower levels of salable minerals have been removed compared with earlier periods. This drop can be explained in part by the decline in road construction on the forest.

Mineral revenues generated from collection receipts declined overall since the late 1980s, although there was a peak around 1997 (fig. 16).

Forest interviewees stated that the Plan has had limited impact on mining activity on the forest. Because there has been little in the way of large-scale minerals extraction, the Plan has not been much of a constraint on mining. An exception is the increased scrutiny over mining activity in riparian reserves. Miners who wish to operate inside of riparian reserves are subject to Plan analysis requirements and mitigations before a plan of operation can be approved. Special mitigation measures may also be required in the

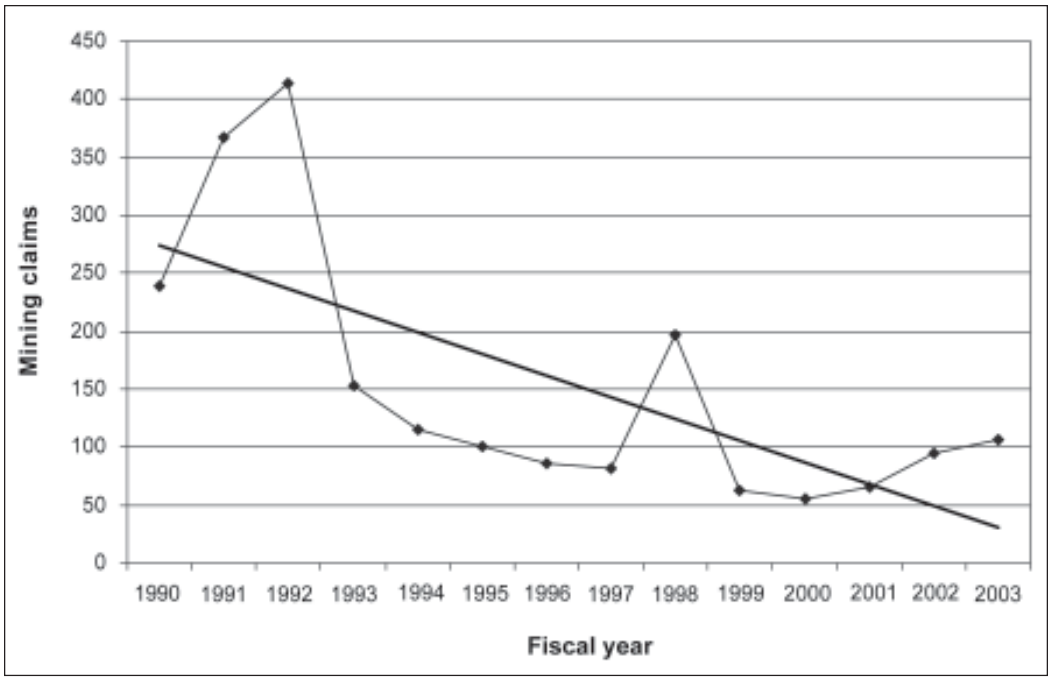


Figure 14—Number of new mining claims located, Klamath National Forest, 1990–2003. Source: BLM LR2000 report.

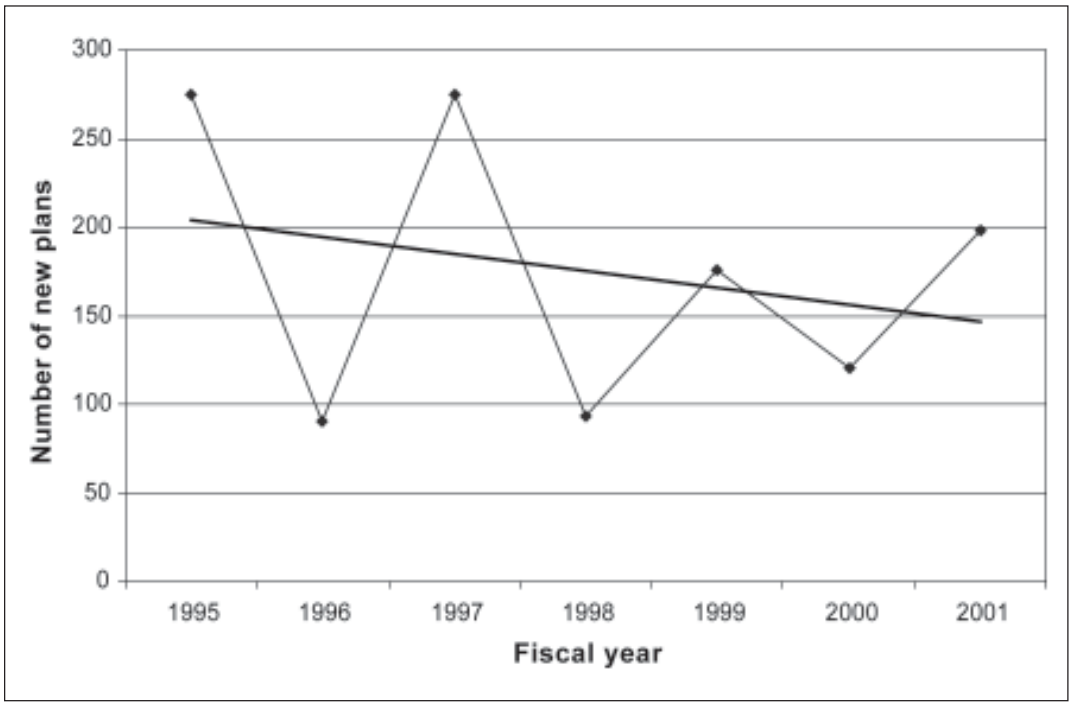


Figure 15—Number of new mining plans of operation approved, Klamath National Forest, 1995–2001. Source: MAR attainment report.

Table 2—Volume of salable minerals removed, Klamath National Forest, 1994–2003

Year	Contracts	Free use	Forest Service use	Totals
		Tons		
1994	18,534	8,665	483	27,682
1995	10,557	4,934	6,860	22,351
1996	15,370	450	7,036	22,856
1997	3,659	11,101	39,681	54,441
1999	381	92	4,909	5,382
2000	31,284	484	10,923	42,691
2001	375	278	5,075	5,728
2002	3,089	8,122	20,359	31,570
2003	242	3,031	15,591	18,864

Source: Klamath National Forest annual report of mineral materials.

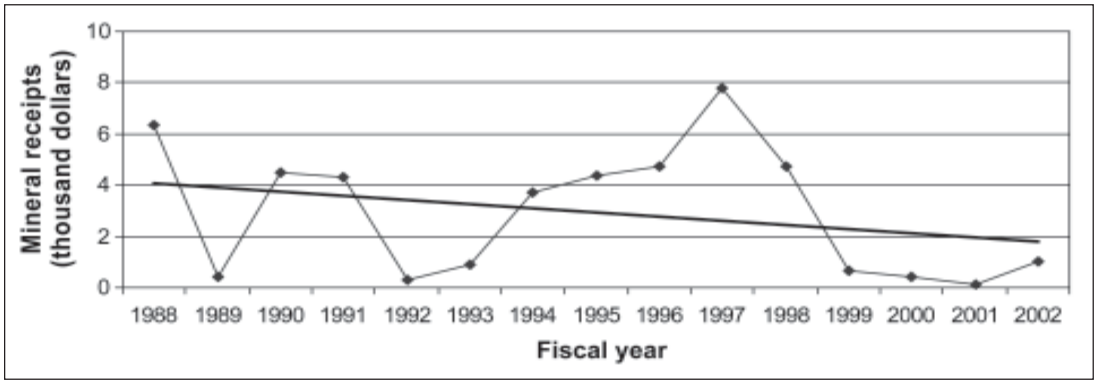


Figure 16—Klamath National Forest collection receipts, minerals, 1988–2002. Source: Annual USDA Forest Service all service receipts ASR-10-3 reports.

reserves. These requirements increase the time and cost needed to obtain a plan of operation. One forest minerals program specialist and one miner interviewed said this increase has had a disproportionate effect on small-scale operators, deterring them from mining in reserves.

No Plan effects on recreational mining were reported. The most significant impacts on suction dredge mining reported were related to changes in the state of California suction dredging regulations issued in May 1994. This change caused the season of operation to be greatly shortened so as not to interfere with the salmon spawning season.

To determine whether predictable levels of minerals have been produced under the Plan, minerals production must be tracked. No leasable minerals were produced during the monitoring period, and the number of mineral leases remained stable. Thus, a predictable level of leasable minerals was produced. The lack of production data for locatable minerals makes it impossible to determine with certainty whether predictable levels of locatable minerals were produced. The available indicator data do show a decline in locatable minerals activity during the monitoring period, although more recently activity has been on the rise. The reasons for the overall decline in activity are not fully known, but the Plan was probably a minor contributing

factor. The volume of salable minerals produced during the monitoring period was much lower than pre-Plan levels. Data suggest that this drop was due more to a lack of demand by users than to management constraints imposed by the Plan.

Recreation

The KNF recreation program aims to offer a wide range of attractions, to promote accessibility to sites and facilities, to maintain or enhance wilderness values, and to design developed sites that support recreation activities on the forest (USDA FS 2005). Another goal is to support recreation-based economic diversification activities in local communities. Recreation opportunities on the KNF include camping, hiking, boating, swimming, hunting, fishing, snowmobiling, and cross-country skiing. The Scott, Salmon, and Klamath Rivers all provide whitewater rafting opportunities. Much of the wilderness use on the forest is administered out of the Scott Valley District. The KNF was reportedly once one of the best places in the United States to fish for steelhead. The steelhead fishery declined sharply prior to 1990, and has only slowly started to come back in recent years. Hunting for deer and elk has been popular throughout the last decade.

Monitoring question—Have predictable levels of recreation opportunities been produced under the Northwest Forest Plan?

Forest Service recreation data pertain to either the supply of or the demand for recreation opportunities on federal forest lands. The monitoring team focused on supply to assess whether predictable levels of recreation opportunities have been produced under the Plan. We also report recreation visitation (an indicator of demand), although the data available only reflect current status (earlier agency recreation visitation data are considered unreliable). The recreation data reported here come from two periods. Earlier data (1994) were obtained from the KNF Land and Resource Management Plan (USDA FS 1994b). The Forest Service began keeping recreation data in the INFRA database in 1999. More recent data were obtained from INFRA.

Table 3 displays changes in select recreation opportunities between 1994 and 2003 and includes those indicators for which data were available. It was not possible to obtain recreation data for all of the indicators from the earlier period. According to table 3 and to interviewees, the overall forest recreation program has not changed substantially over the last decade. There has been a slight increase in the number of developed recreation sites, river access points, and trailheads. The biggest change was a decrease in forest system road miles and miles of trails, reducing access to the KNF for dispersed recreation activities. Roads to developed recreation destinations have not been affected. The number of outfitter/guide permits increased substantially, but it is unknown whether the increase reflects real change in the number of permits, or differences in reporting between 1994 and 2002. In 1994, it was estimated that 20 percent of the recreation activity on the forest occurred at developed sites, and the remaining 80 percent occurred in dispersed areas (USDA FS 1994a).

According to interviewees, demand for recreation on the KNF has changed little over the last decade, although they reported slow growth in back country and wilderness use, and moderate growth in river rafting. There has been some increase in demand for group facilities to accommodate an increase in use by organized groups. The Shasta Tribe would also like to see more group facilities to accommodate tribal gatherings. Some boat ramps have been installed to improve river access. On the east side of the KNF, interviewees reported an increase in birding-related tourism, with a focus on bald eagles (*Haliaeetus leucocephalus*) and other birds of prey.

The KNF is remote, being a 5-hour drive from the major metropolitan areas of Portland and San Francisco. And the population of Siskiyou County grew by less than 2 percent between 1990 and 2000. As a result, the KNF is one of the least-visited forests in the Plan area (English 2003). Recreation demand on the KNF comes mainly from people who reside in the local region. Nearly 75 percent of the visitors

Table 3—Recreation opportunities on the Klamath National Forest, 1994–2003

Recreation indicator	1994[a]	2001–2003
Annual forest visits		415,400[b] (2001 data)
Developed campgrounds	30	32[c] (2003 data)
Picnic sites	2	3[d] (2003 data)
Number of trailheads	9	14[d] (2003 data)
Miles of trails	1,330	1,129.5[d] (2002 data)
Miles of system roads[e]	4,685 (as of end of FY1997)	4,177 (as of end of FY 2002)
Recreation residences	21	22[d] (2002 data)
Miles of wild and scenic river	152	152[f] (2003 data)
Acres of wilderness[f]	381,000	381,000
Number of outfitter/guide permits	64 (whitewater guides only)	106[d] (2002 data)

Note: These data include the Ukonom District.

[a] Source: USDA FS 1994a.

[b] Source: English 2003.

[c] Source: Forest Service INFRA database. Note: Klamath National Forest Web site says there are 28 developed campgrounds.

[d] Source: Forest Service INFRA database.

[e] Source: Forest Service Annual Forest Road Accomplishment Reports.

[f] Source: http://www.fs.fed.us/r5/klamath/.

to day-use sites and general forest areas on the KNF live within 35 miles of forest boundaries (English 2003). The majority of visitors to developed overnight sites and wilderness areas come from farther away, however.

Little change in demand for recreation over the last decade means that the KNF invested little in recreation development, working instead to maintain existing recreation sites and facilities. The forest has had little money to invest in recreation because the program budget has been flat and the staff decreased. Community recreation stakeholders interviewed reported deteriorating trails, campgrounds needing improvements, and too few employees on the ground to address recreation management problems.

The KNF did develop snowmobile trails and facilities on the east side with funding from the California State Green Sticker program, which provides an opportunity to use a portion of the snowmobile license fees paid by members of the public to improve snowmobiling conditions. The KNF used these fees to maintain and expand its network of snowmobile trails, and to build warming huts along them.

Otherwise, the forest has focused on expanding accessibility opportunities for people with mobility impairments. With national and regional direction, emphasis, and funding, this effort focuses on ensuring that at least one fully accessible recreation opportunity is available for each of

the KNF's major recreation activities. Between 1994 and 2004, the forest made numerous improvements on existing sites to meet this goal. Accessibility enhancements provide greater access and recreational opportunity for people with disabilities and families with elders and children, significantly extending recreational services and experiences on the forest.

The beautiful scenery on the KNF is a feature that attracts recreationists. Visual quality on the forest decreased between 1980 and 1991 (USDA FS 1994a: 3-77–3-78). There are no quantitative data available for recent years that permit monitoring visual quality indicators (see USDA FS 1994a for data on scenic quality from 1994). Interviewees stated that scenic quality had improved over the last decade, however.

Collection receipts generated from recreation climbed during the 1990s, but have declined since 1997 (fig. 17). Fee demo (charging fees for the use of some recreation sites) was instituted for developed campgrounds in 2001. The drop in revenues since 1999 probably reflects fee demo, as this money is retained on the KNF and does not go into National Forest Fund revenues sent to the Treasury, which are reflected in collection receipts.

Interviewees stated that the Plan did not have a significant impact on the KNF recreation program. Improved scenic quality was attributed to the Land and Resource Management Plan, adopted in 1995, which established land management objectives for scenic quality for the first time. Doing so made scenery a stronger factor in decisionmaking, and caused timber project design to protect scenic quality. The creation of late-successional reserves and riparian reserves also helped maintain scenic quality on the KNF. Recreation specialists interviewed indicated that the Plan has not been a major constraint on the KNF recreation program because few major developments that would trigger plan requirements and procedures have been proposed. The recreation projects that have occurred have generally fallen under NEPA categorical exclusions. The Plan has affected KNF budgets and staffing, however (see the section "Forest Jobs, Budget, and Reorganization").

Forest Products and Recreation Summary

The answer to the first evaluation question (Are predictable levels of timber and nontimber resources available and being produced?) differs by resource area. The level of timber produced did not meet the ASQ volumes anticipated during the first decade of the Plan. The KNF's ASQ estimate was 51 million board feet. On average, about 34 million board feet of timber was offered for sale each year between 1995 and 2002 of which a smaller amount fell in the category predicted by ASQ. The Plan contributed to this shortfall in many ways described here.

The best indicator for which agency data were available for assessing whether predictable levels of special forest

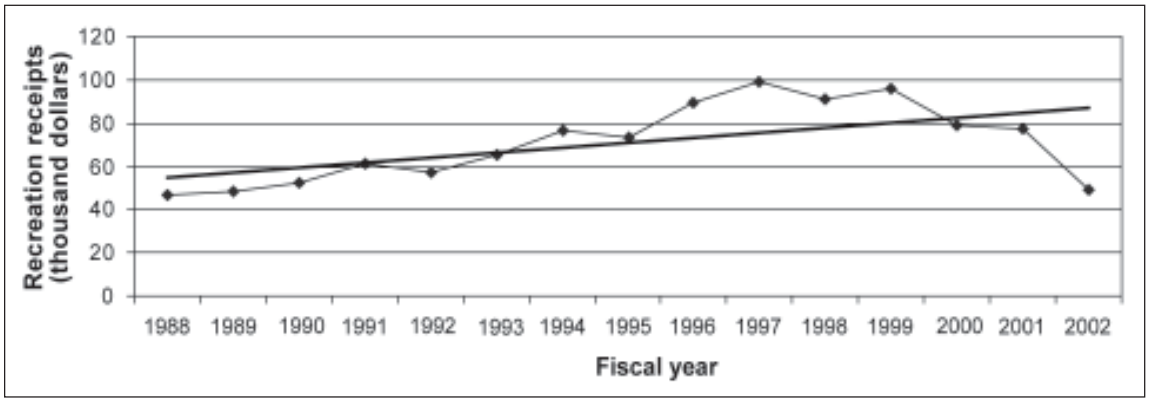


Figure 17—Klamath National Forest collection receipts, recreation, 1988–2002. Source: Annual USDA Forest Service all service receipts ASR-10-3 reports.

products were produced was the quantity of products sold. This indicator is inadequate for answering the monitoring question because, for most products, the extent to which the quantity of products sold was determined by supply versus harvester demand is unknown. Moreover, the indicator reflects permitted harvest only. The quantity of fuelwood and Christmas trees sold declined, whereas the volume of poles and posts sold increased slightly. The decline in the quantity of fuelwood sold was expected because of harvest restrictions in the reserves and decreased timber harvesting. Trends for nonconvertible products were mixed.

Grazing declined slightly on the KNF between 1994 and 2002, but overall the program is viewed as relatively stable and as experiencing minor effects from the Plan. Some declines in grazing were expected under the Plan because of management constraints in the reserves, particularly 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. No leasable minerals were produced on the KNF between 1990 and 2000, 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 showed a decline in activity on the KNF since the Plan was implemented. The volume of salable minerals produced on the KNF varied annually, but was much lower than 1980s levels. We do not know to what extent production trends were the result of the Plan or factors related to demand. The specialists interviewed did not think the Plan was much of a constraint on minerals production.

Available data indicate that some kinds of recreation opportunities decreased on the KNF, and some increased between 1994 and 2002, but that overall there has been little change in the forest recreation program. Interviewees stated that the Plan had not had a significant effect on the program.

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. The best available data indicate that for most resources, production remained stable or declined, 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.

Forest Jobs, Budget, and Reorganization

National forests are an important source of quality jobs for residents of forest-based communities. Agency employees earn good wages, receive benefits, enjoy relatively safe working conditions, undergo training to develop new skills, and have opportunities for advancement within the organization. Historically, the KNF offered many permanent full-time and seasonal or part-time jobs in local communities. Seasonal and part-time jobs are especially important to young people who want summer work, and people who engage in other pursuits. Agency jobs are an important socioeconomic benefit associated with federal forest lands.

Agency employees also contribute substantially to community capacity because they are often well educated and active in their communities as volunteers and leaders. In addition, they contribute to the local economy. The presence of agency employees in local communities also enhances relations between communities and national forests by facilitating interaction, communication, and trust building.

Forest Jobs

Monitoring question–How did the number and type of jobs on the Klamath National Forest Change after the Northwest Forest Plan was adopted?

Figure 18 shows the number of full-time employee equivalent positions (FTEs) on the KNF between 1993 and 2002. One FTE can represent one full-time job, or a combination of part-time positions, counted in aggregate.

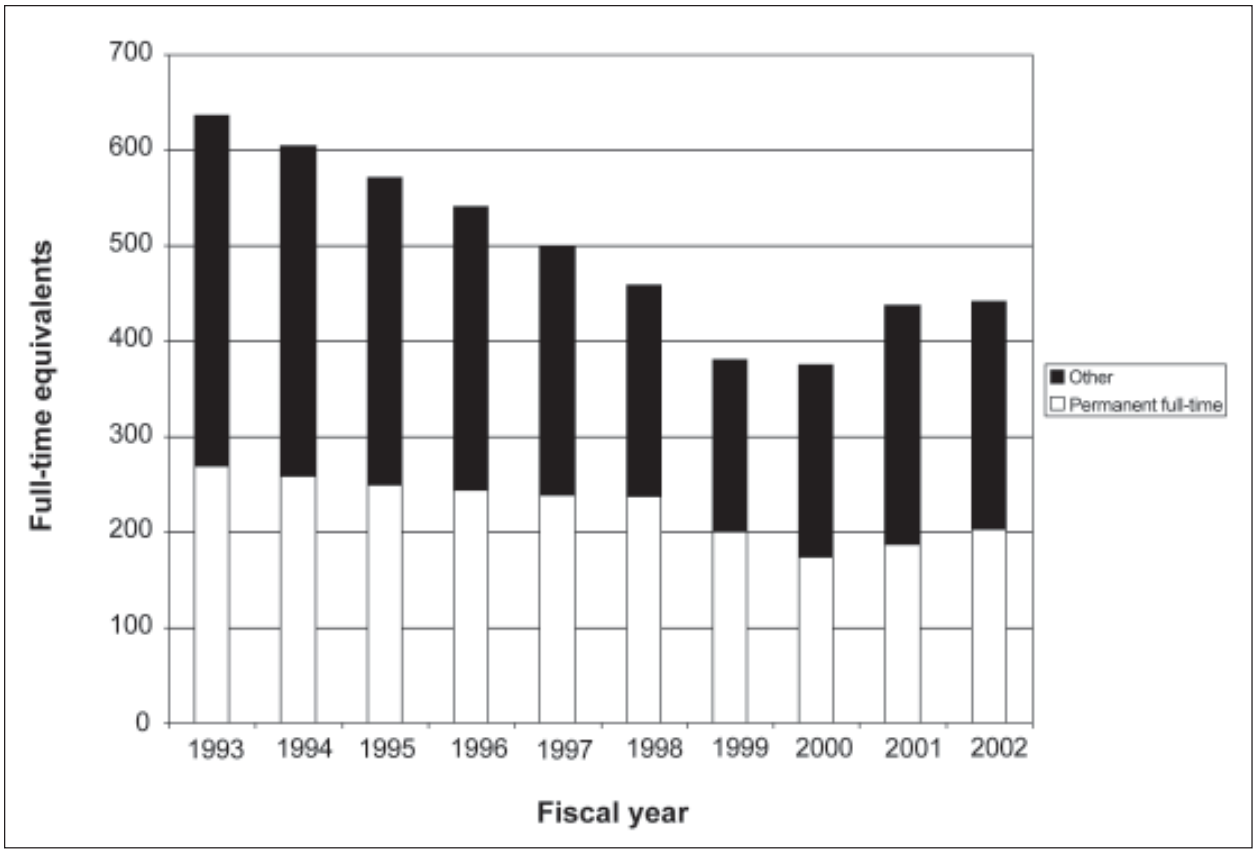


Figure 18—Klamath National Forest staffing levels, 1993–2002. Source: Forest Service Pacific Southwest Region Office of Human Resources.

It includes permanent, temporary, and term tenures. The number of FTEs went from a high of 636 positions in 1993, one year before the Northwest Forest Plan was signed, to 441 positions in 2002, representing a loss of 31 percent. The number of forest jobs increased between 2000 and 2002, probably because of fire hiring and flood repair work. Employment on the KNF was higher than the average for the four northern California Northwest Forest Plan-area national forests (the Klamath, Shasta-Trinity, Six Rivers, and Mendocino), but employment trends there were consistent with those elsewhere in the California portion of the region.

In all but 2 years, full-time permanent positions represented less than half of the total number of forest jobs. This figure emphasizes the importance of part-time and seasonal employment opportunities to local communities. Permanent full-time positions declined slowly between 1993 and 2000, whereas other positions dropped off more sharply.

Monitoring question–How did the Klamath National Forest budget change during the Plan period?

Forest employment is directly tied to the forest budget. Figure 19 shows the total budget allocation to the KNF each year between 1993 and 2003. Overall, the KNF budget dropped 18 percent between 1993 and 2003. The budget peak in 1998 resulted from the influx of emergency money that came from the Emergency Relief for Federally Owned Roads (ERFO) program following a 1997 flood. Interestingly, there is no employment peak that occurs at this same time. Although the rise in FTEs that began in 2000 may in part be related to the influx of ERFO funds, a portion of this money was also spent on contracting (see section on contracting). The addition of emergency fire money in 1999

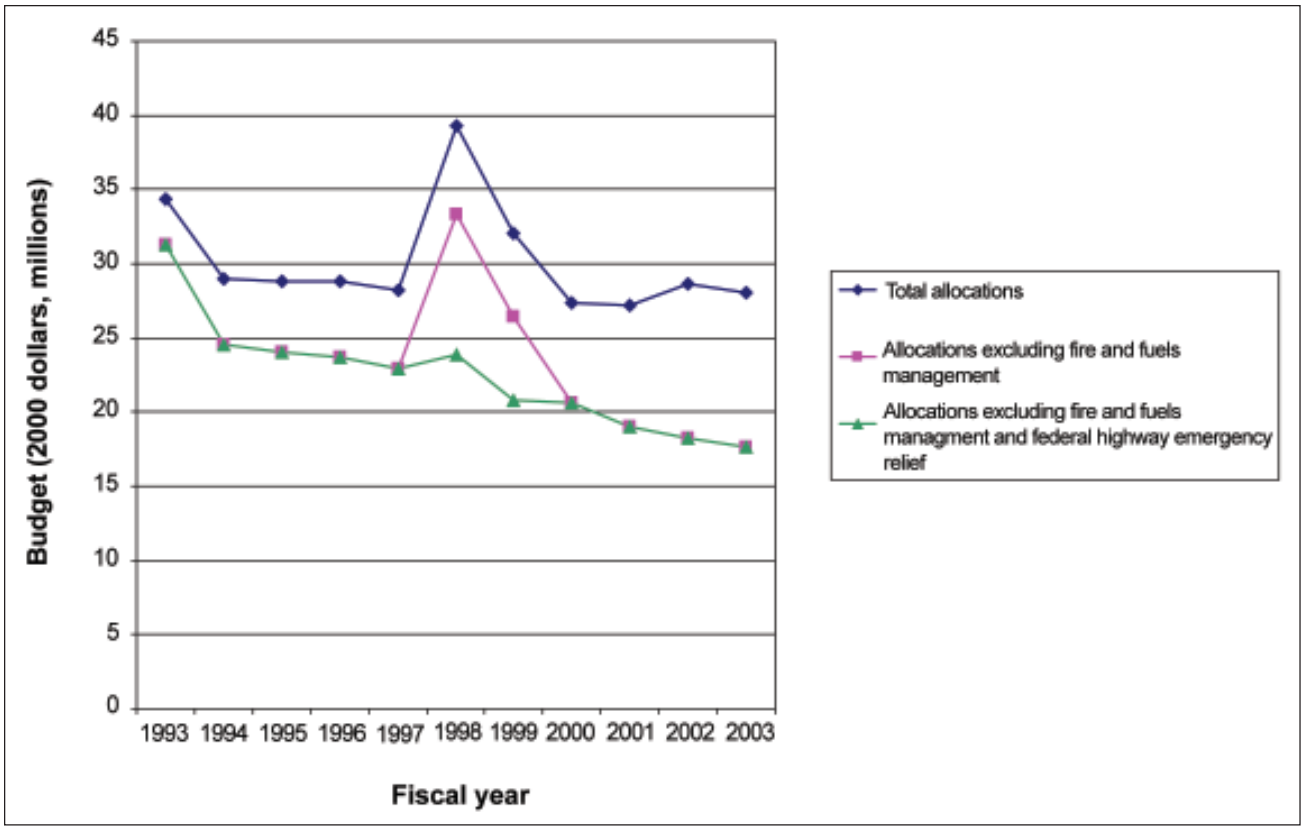


Figure 19—Klamath National forest budget allocations, 1993–2003. Source: Forest Service Pacific Southwest Region Office of Program Development and Budget.

and National Fire Plan money in later years partly compensated for budget declines in other program areas. The average annual total budget decline was 1.84 percent, but the average annual decline in ordinary, nonfire allocations was 4.36 percent. According to KNF interviewees, budget cuts have been proportional across program areas, although the recreation program did not drop as much as other programs did, and fire was a growth area (fig. 20).

Forest Reorganization

Monitoring question–How did the presence and geographic distribution of agency offices containing unit-scale decisionmakers change between 1990 and 2004?

Meaningful collaboration between federal agencies and local communities requires that community members have ongoing access to federal decisionmakers. Interactions between local people and agency employees also builds trust. Thus, the presence of local agency offices and decisionmakers can affect relations between the KNF and community members.

Cuts in forest staffing and budgets contributed to a consolidation of KNF offices during the 1990s. The Oak Knoll Ranger District Office closed and consolidated in 1997 with two other ranger district offices. Administration of the Ukonom Ranger District–still a part of the KNF–moved from Somes Bar to the Orleans District office of the Six Rivers National Forest around 1998. The Scott River and Salmon River Ranger District Offices were co-located in Fort Jones in 1996.

Forest Jobs and Budget Summary

Klamath National Forest staffing and budget dropped substantially under the Plan, resulting in a reduction and consolidation of ranger district offices. The Plan contributed

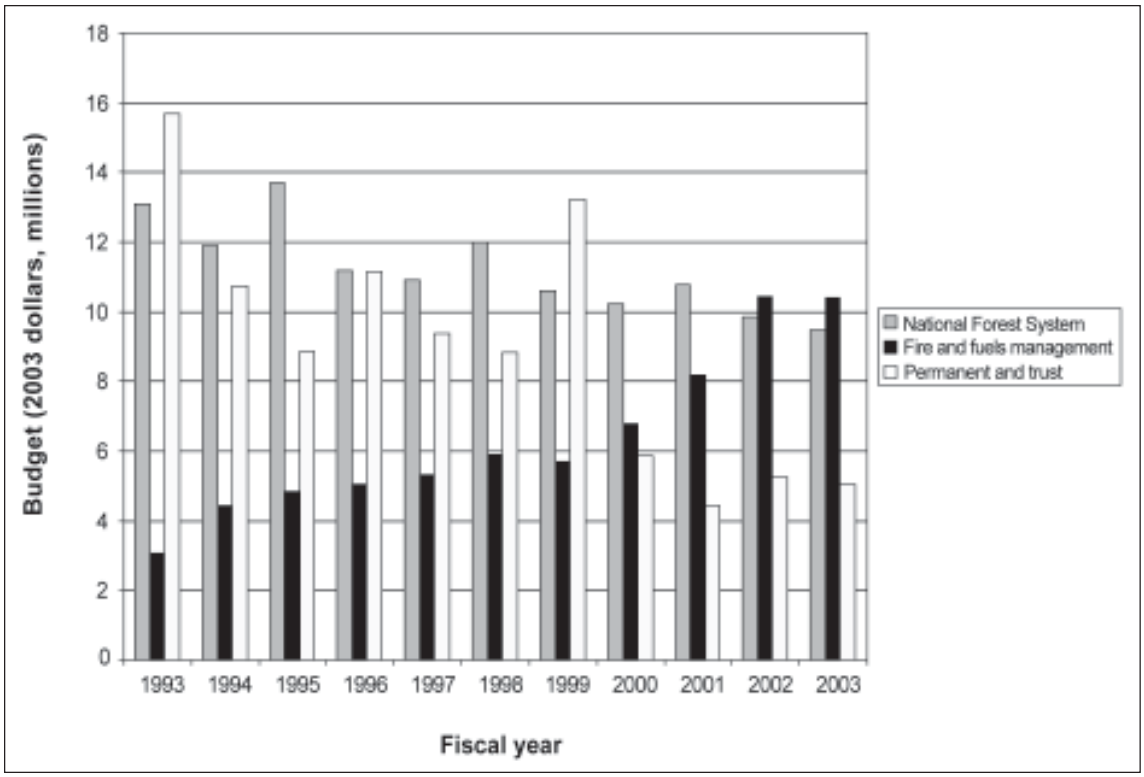


Figure 20—Klamath National Forest major budget program allocations, 1993–2003. Source: Forest Service Pacific Southwest Region Office of Program Development and Budget.

significantly to this change. Forest interviewees cited the main reason for the decline in forest staffing and budgets as the reduction in the forest timber program. Because the timber sale program was dramatically cut back under the Plan, the KNF was not allocated the same magnitude of timber sale preparation money it had received in earlier years, and timber harvest receipts, which also help support the KNF budget, fell. As a result, the forest had much less funding in 2003 for conducting ecosystem management activities other than fuel treatments than it had in 1993.

Procurement Contracting for Land Management

To mitigate the loss of timber jobs, the Northwest Forest Plan included a goal to contribute to the well-being of rural communities by assisting them with long-term economic development and diversification. The Forest Service was expected to create new jobs in the woods associated with ecosystem management. The Plan called for restoring late-successional and old-growth (older forest) habitat and watershed health. It also contained survey and monitoring requirements that called for agencies to undertake new kinds of activities that ranged from surveying for northern spotted owls to thinning plantations to restore old-growth characteristics. In addition, because the Plan called for sharply reducing intensive timber management, the road building, maintenance, and decommissioning that was a part of timber sales would now have to be done through other mechanisms. Procurement contracting—the purchase of goods and services—is one way the Forest Service could restore forests and undertake other work on the ground (such as work associated with recreation, restoration, or monitoring) while contributing to local economic development. In the early 1990s, agencies accomplished much of their forestry services work (such as reforestation and timber stand improvement) through procurement contracts. This

work, and new jobs related to ecosystem management consistent with Plan goals, would continue to be accomplished mainly through procurement contracts (although some occurred in-house or through grants and agreements).

The Plan changed management priorities for the federal land-management agencies. At the same time, President Clinton created the Jobs-in-the-Woods (JITW) program, which sought to create job opportunities for people who had been displaced by the new management priorities that focused on endangered species protection and ecosystem management. Procurement contracting was one of the ways the federal land management agencies intended to implement the JITW program. The Forest Service was exempted from free and open competition procurement requirements and allowed to set aside JITW contracts for contractors in the Plan's affected counties.

After funding for the JITW program dwindled, several other administrative and congressional programs sought to create economic benefits for rural, forest-based communities by using procurement contracting. For example, the National Fire Plan, the Secure Rural Schools and Community Self-Determination Act of 2000, and the stewardship contracting pilot program all attempted to create rural community benefit by using procurement contracting as a source of jobs and business opportunities (Moseley and Toth 2004). If these programs were effective, contractors in communities near federal forests would capture proportionately more of the contract dollars than in the early 1990s, because these programs created direction or authority to direct work to local communities.

Monitoring questions—(1) How much and what kind of ecosystem management work did the Klamath National Forest contract between 1990 and 2002, and how did this work change over time? (2) Who received economic benefits from Klamath National Forest procurement contracting, and how did these benefits change over time?[2]

Between 1990 and 2002, the KNF spent $44.5 million procuring land management services.[3] Most of this spending (64 percent) took place between 1990 and 1993 (fig. 21). After 1993, contract spending on the KNF dropped off sharply. The relatively high level of contract spending in the early 1990s was likely due in part to salvage and restoration work still going on at that time following a catastrophic fire event in 1987. In 1997, there was a major flood on the forest. The KNF received $30 million of ERFO money in 1998–99 to do restoration work. The rise in contract spending in 2000 and 2001 reflects the surge in restoration work that took place as a result of the flood money.

Of the $44.5 million spent on procurement, the KNF spent $30.3 million on labor-intensive activities (e.g., tree planting, thinning), $11.0 million on equipment-intensive activities (e.g., road work), and $3.1 million on technical work (e.g., surveys and analysis). As with other national forests in the Plan area, the KNF reduced its spending on labor-intensive contracting over the course of the study period. It also reduced its spending on equipment-intensive and technical contracting, although not as substantially as with labor-intensive procurement.

Labor-intensive spending declined from $23.5 million in 1990–92 to $4.5 million in 1995–97, and declined further to $2.3 million in 2000–2002. Land treatment practices, thinning, and tree planting were the major labor-intensive activities during 1990–92, but diminished greatly after that (fig. 22). Although such a decline would be expected in the case of tree planting with the dropoff in the timber program, the KNF is largely a fire-adapted ecosystem, and therefore one might expect to have seen an increase rather than a decrease in thinning procurement in 2000–2002.

Among equipment-intensive activities, the KNF spent the most on road construction and maintenance (fig. 23).

[2] For a description of the methods used in this analysis, see Moseley 2006.

[3] Fire contracting data are not included in this analysis because they are tracked differently by the Forest Service than other procurement contracts are, and we did not have the time and resources available to include the fire contracting information.

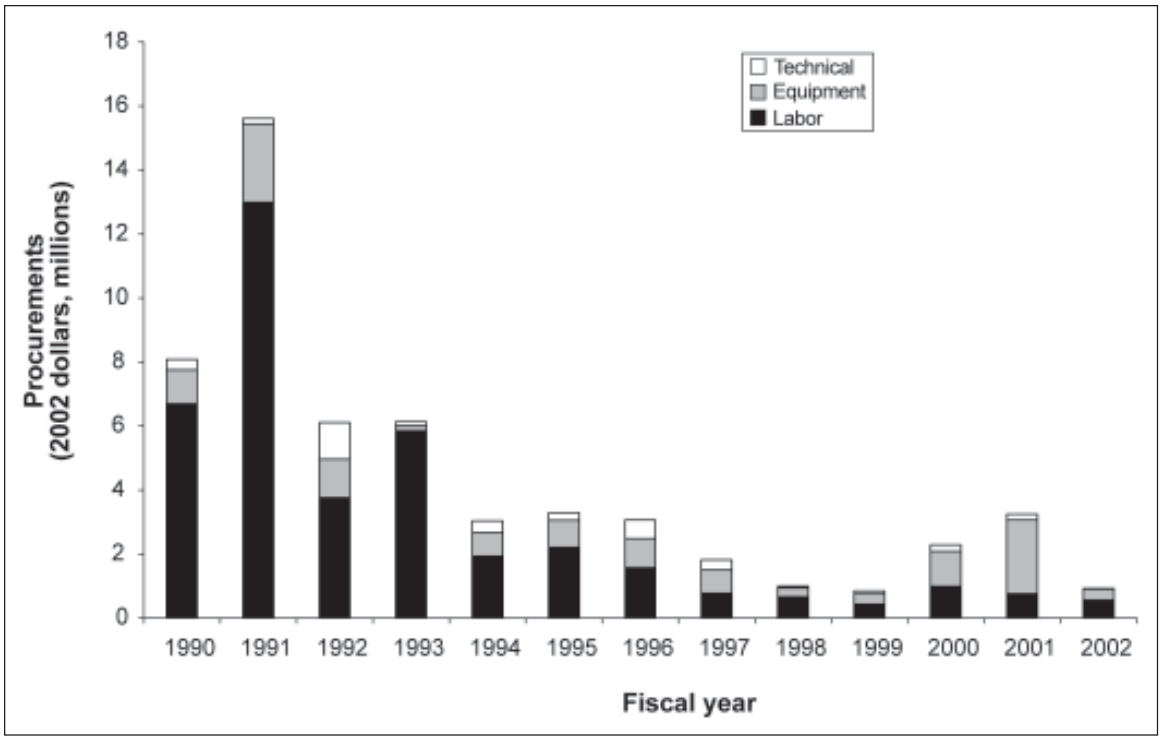


Figure 21—Annual procurement spending by work type, Klamath National Forest.

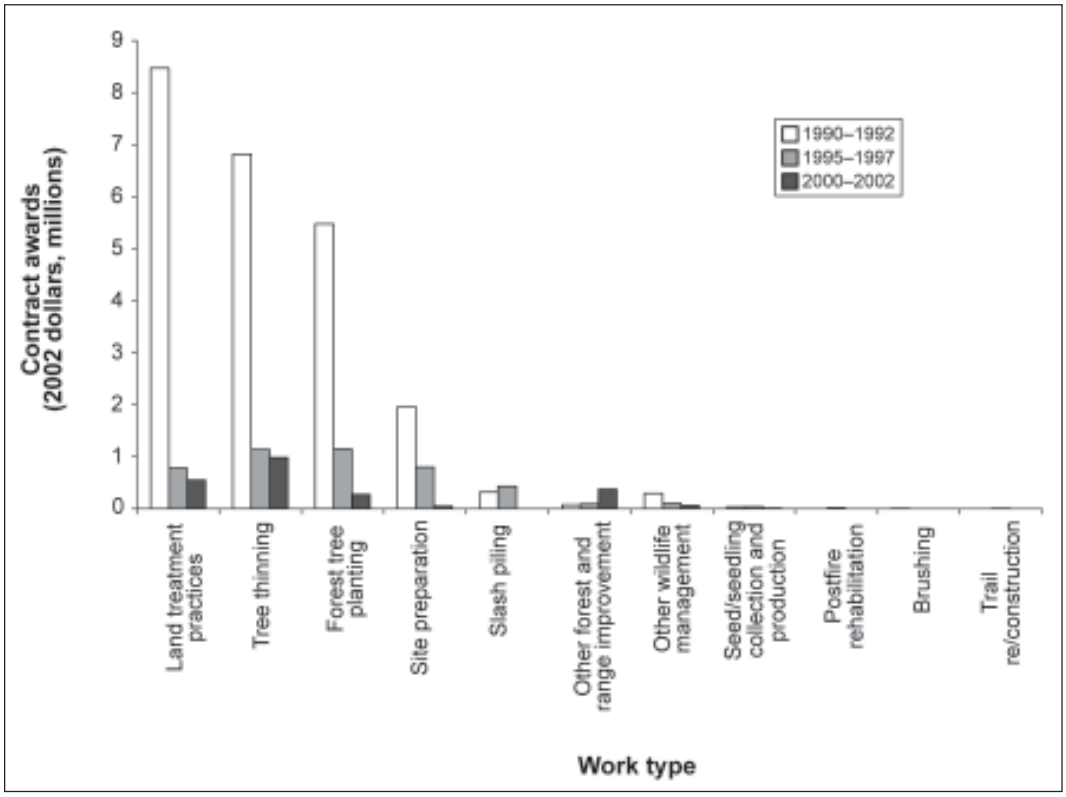


Figure 22—Labor-intensive contracting, Klamath National Forest, 1990–2002.

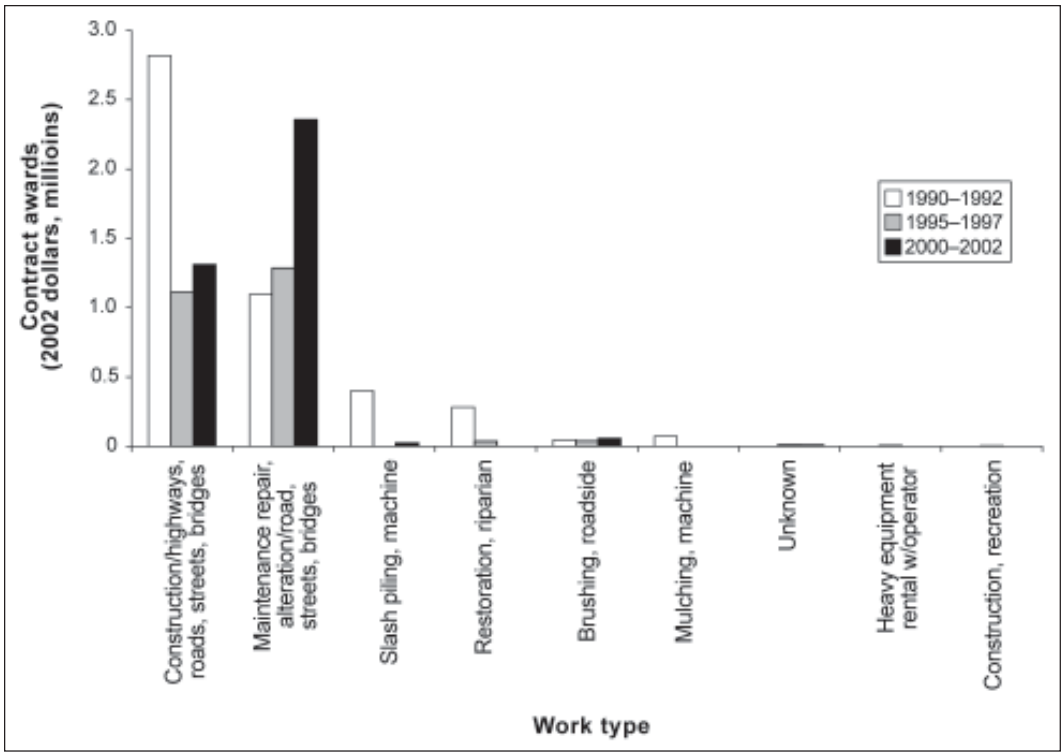


Figure 23—Equipment-intensive contracting, Klamath National Forest, 1990–2002.

Road construction spending was largest during 1990–92, whereas road maintenance was greatest during 2000–2002.

Discerning a clear pattern among the technical work is difficult (fig. 24). Timber-related surveys and cone collection declined, which suggests a shift away from technical activities associated with timber management. However, archaeological, historical, and ethnographic studies, biological studies, and wildlife studies declined as well. This may indicate that such studies were typically conducted in association with the timber program. At the same time, "other natural resource management and conservation" increased, likely signaling an increase in studies to meet the Plan's survey-and-manage requirements. Unfortunately, it is difficult to tell because the product service code for these activities includes a wide variety of tasks.

During 1990–92, 101 contractors worked for the KNF. That number fell to 58 by 2000–2002, representing a 43-percent decline. Over the same period, procurement spending by the forest declined by 78 percent. On average then, the remaining contractors captured less contract value in the early 2000s than they did a decade earlier.

The dramatic decline in KNF procurement spending did not lead to increased concentration of contracting work among the forest's contractors (table 4). In 1990–92, a single contractor captured 25 percent of KNF procurement contracts, and five contractors (4.95 percent of the total number) captured 50 percent of the forest's contract value. In 2000–2002, six contractors (10.35 percent) captured 50 percent of the procurement value that the forest offered, meaning that market concentration declined over the study period. Nevertheless, in both periods the vast majority of the contractors (80 and 75 percent, respectively) captured only one quarter of the procurement dollars spent by the KNF.

The KNF had a high rate of turnover among its contractors. Of the 101 contractors working for the forest in 1990–92, only 3 worked for the forest a decade later. The three returning contractors captured more contract dollars on average than the new contractors did, although they did not receive the largest contracts.

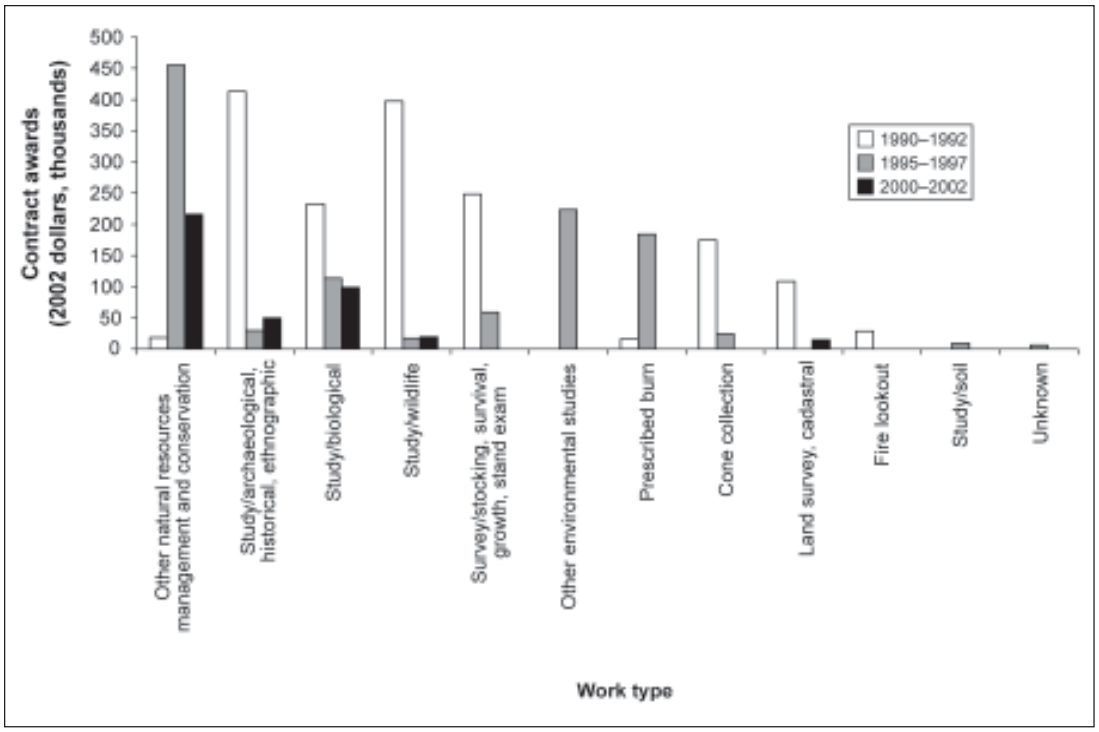


Figure 24—Technical contracting, Klamath National Forest, 1990–2002.

Table 4—Concentration of contracting awards by size of contractor, Klamath National Forest

Contract value	1990–1992		2000–2002	
	Number of contractors	*Percentage of contractors*	*Number of contractors*	*Percentage of contractors*
1st quartile	1	0.99	2	3.45
2nd quartile	4	3.96	4	6.90
3rd quartile	15	14.85	8	13.79
4th quartile	81	80.20	44	75.86
Total	101	100.00	58	100.00

The KNF awarded contracts to contractors located primarily along the Interstate-5 corridor, and in communities in or near the forest. During this period, labor-intensive contracts went mainly to contractors located along Interstate 5 in northern California and in the Willamette Valley in Oregon, and equipment-intensive contracts went almost exclusively to northern California contractors, especially those located in Siskiyou and adjacent counties (fig. 25).

Over the study period, proportionately more contracts were awarded to contractors located closer to the forest (fig. 26). In 1990–92, contractors working on the KNF came from up and down Interstate 5. Over time, contractors were increasingly concentrated in northern California and southern Oregon, and then finally in northern California. Corresponding to this trend, in the early 1990s, contractors traveled an average distance of 134.5 air miles to work on the KNF (table 5). By 1999–2001, the average distance traveled to work on the Klamath had fallen to 102.9 air miles. This difference of 31.6 air miles was statistically significant. The increasing localization of contract recipients is attributable, in large part, to the decline in the amount of labor contracting that the KNF undertook between 1990 and 2002. In addition, those labor-intensive contracts that the forest did award went to contractors located closer and closer to the forest over time (labor-intensive contractors came from an average of 140.8 miles away from the forest in 1990–92, compared with an average of 86 miles away in 1999–2001). In contrast, the change in the distance that equipment-intensive and technical contractors traveled over time was not significant.

The KNF awarded 40.1 percent of its contract value to rural contractors in 1990–92 (people living in communities having under 5,000 people) (table 6). By 2000–2002, this number had increased to 48.4 percent. In real dollars, however, awards to rural contractors declined from nearly $12 million in 1990–92, to just over $3 million in 2000–2002. This proportional shift may be partially explained by the decrease in the number of contractors coming from places having an unknown population size, but it could also be attributed to the decline in awards to contractors located in small towns (having populations of 5,000 to 9,999 people). The percentage of total contract value awarded to urban contractors (those living in communities of over 50,000 people) remained the same in the two periods.

Throughout the study period, the KNF awarded most of its contract value to contractors located in counties that were eligible for JITW program economic assistance because they had been negatively affected by the cutbacks in timber harvesting that occurred under the Plan (fig. 27). However, the proportion of contract value awarded to contractors from these affected counties fell from 90.1 percent in 1990–92, to 82.5 percent in 1995-97. This is the opposite of the intended impact of the JITW program, which sought to provide more jobs to workers in counties affected by the Plan.

The most striking feature of the KNF's procurement contracting practices over the last 12 years is the 78-percent decline in spending that occurred between 1990–92 and 2000–2002. The KNF's large reduction in procurement spending was considerably greater than that in the Plan area as a whole, which averaged a 59-percent decline. However, it was comparable to the decline in contract spending that occurred on other northern California forests (see Moseley et al. 2003). The decline in procurement spending undoubtedly had a great impact on both rural and local contractors, despite the fact that these contractors captured proportionately more contract value in the early 2000s than they did a decade earlier.

Clearly, catastrophic events such as fires and floods influence the amount of contracting work that is available on the KNF. When such events occur, they create too much work for the forest to accomplish internally; associated emergency dollars directed to the forest to address the catastrophe result in contracting opportunities. However, such episodic events do not provide a predictable supply of work.

According to interviewees, local communities around the KNF expected that under the Plan there would be new opportunities to engage in contracting work doing ecosystem-management-related activities, such as ecological restoration work. These opportunities were expected to

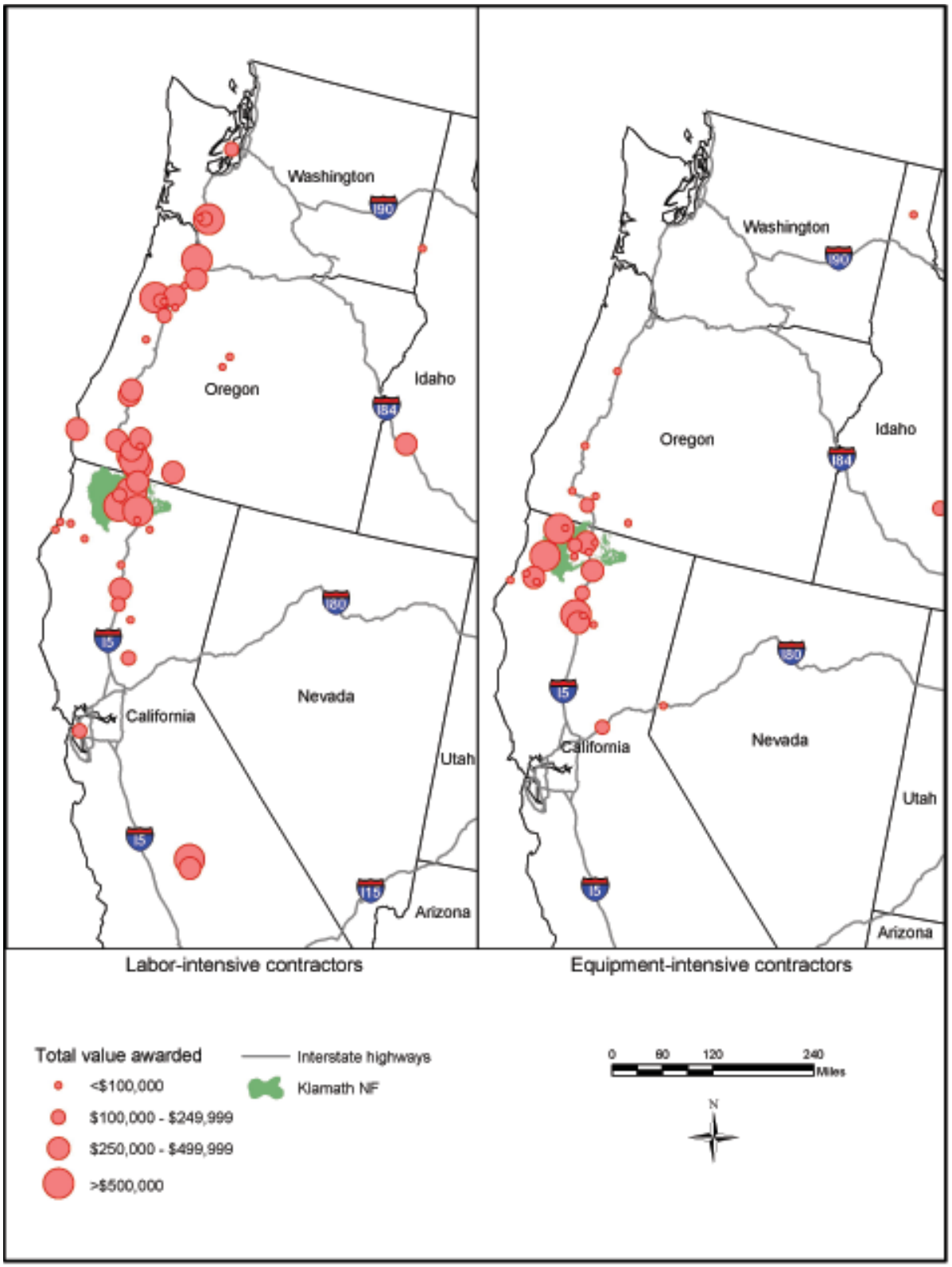


Figure 25—Location of labor-intensive and equipment-intensive Klamath National Forest contract recipients, 1990–2002.

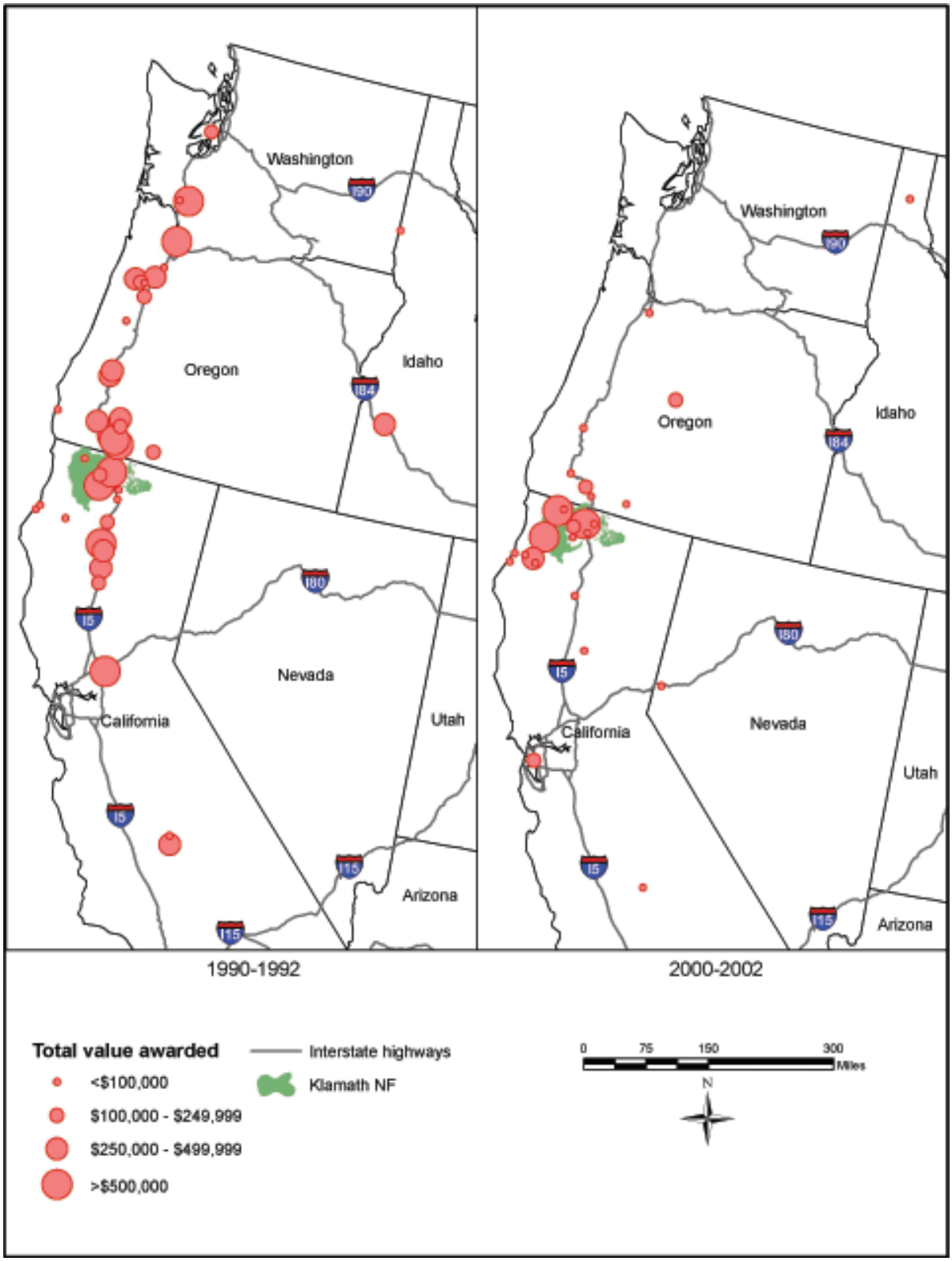


Figure 26—Location of contract recipients, Klamath National Forest, 1990–1992 and 2000–2002.

Table 5—Distance traveled by contractors to work on the Klamath National Forest

	Fiscal years 1990–1992	Fiscal years 1999–2001	Significance
		Air miles	
Mean distance			
All contracts	134.52	102.93	0.061
Labor	140.84	86.01	0.005
Equipment	110.34	117.72	0.833
Technical	125.37	93.35	0.269
Median distance			
All contracts	61.56	47.54	
Labor	60.28	39.87	
Equipment	70.59	47.54	
Technical	69.05	86.69	
Contracts		*Number*	
All contracts	201	105	
Labor	149	39	
Equipment	31	53	
Technical	21	13	

Table 6—Percentage of contract value by contractor's community size, Klamath National Forest

Community population (1998)	1990–1992		2000–2002	
	Real dollars	*Percent*	*Real dollars*	*Percent*
<5,000	11,987,000	40.1	3,149,000	48.4
5,000-9,999	5,437,000	18.2	932,000	14.3
10,000-50,000	4,614,000	15.4	1,219,000	18.7
>50,000	4,545,000	15.2	992,000	15.2
Unknown	3,291,000	11.0	216,000	3.3
Total	29,874,000	100.0	6,509,000	100.0

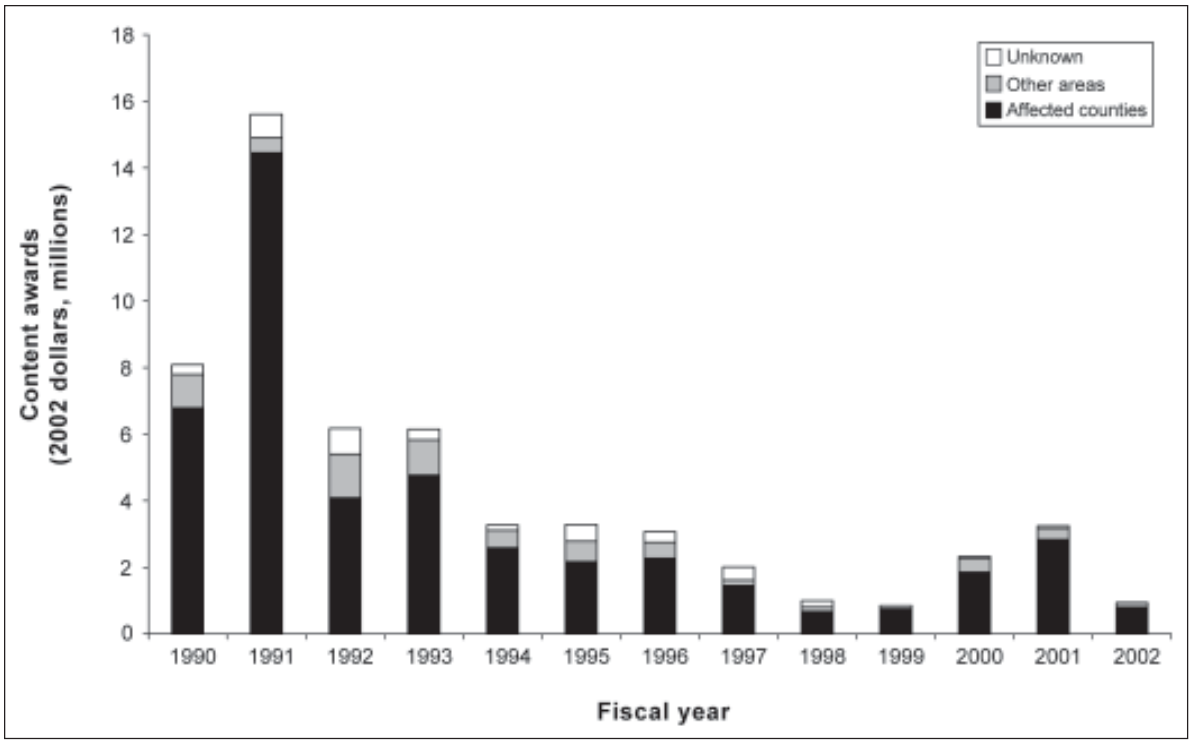


Figure 27—Contract awards to Northwest Forest Plan-affected counties, Klamath National Forest, 1990–2002.

help offset the loss in timber industry jobs associated with reductions in federal timber harvests. The data clearly indicate that these opportunities did not materialize as envisioned. Why?

Forest interviewees gave several reasons. First, there was not that much contract work available overall. When restoration work was available, it tended to be equipment-intensive work, rather than labor-intensive work, meaning that it provided few jobs. Second, apart from the emergency funds cited above, there wasn't much money available in the KNF budget to fund contracts. As the previous section demonstrates, the KNF budget declined substantially throughout the 1990s, meaning there was little base money available to fund contracts. When there was work that could be done in-house and money to do it with, the KNF preferred to keep its own staff employed, rather than lay off additional workers and fund outside contractors. The reductions in staffing that followed the decline in the forest budget were significant, and opportunities to minimize those reductions were seized. Third, the Plan greatly increased the planning and analysis requirements associated with accomplishing projects. This planning and analysis work is typically performed by Forest Service employees. Because such a large proportion of project money was now being spent on planning and analysis, there was less money available to actually do projects on the ground, which is where the contracting opportunities generally lie.

Fourth, although one expectation of the Northwest Forest Plan was that more contracting work would be made available locally, the Plan did not contain any special provisions or tools that would make it easier from an administrative standpoint to award contracts to local residents within the needed timeframe. Displaced workers needed new work opportunities right away in order to remain in their communities and find jobs, but the organizational change within the Forest Service required to make this happen didn't take place. Agency acquisition regulations were designed to favor efficiency through economies of

scale and the lowest bidder, not local hire. Although this has begun to change in recent years with the option to use best value contracting and stewardship contracts, these changes were not in time to help most local workers. Consequently, many of these workers moved away in the early 1990s, taking their skills and infrastructure (e.g., equipment) with them. The fact that the contracting work that has been available on the KNF is sporadic and does not provide a reliable source of income has also caused potential contractors to move elsewhere in search of work. The result is that when contract work is available, there could be a shortage of people with the needed skills and equipment to perform it.

Reductions in agency budgets and staffing, and in the amount of contract work available on the other three northern California national forests in the Plan area, caused these forests to move from forest-based contracting to province-level ("zone") contracting in the late 1990s, a shift that also occurred elsewhere in Region 5. This meant the KNF contracting organization had to reorganize, causing contracting processes to stall. It has taken the forest a long time to figure out how to get contracting work accomplished under the new organizational structure.

Finally, the KNF sees advantages to accomplishing work through partnership agreements instead of contracts when the opportunity arises. Partnership agreements are more flexible than contracts. The terms and conditions can be changed more easily, and they can be a tool for leveraging outside money to help accomplish work. Although agreements may provide work opportunities for local residents, a shift toward using them would contribute to the decline in contracting trends reflected by the data. Trend data for dollars spent on agreements were unavailable.

Community Economic Assistance

One goal of the Northwest Forest Plan was to minimize adverse effects on jobs and to assist with long-term economic development and diversification in rural communities affected by cutbacks in timber harvest on federal forest lands. Four major economic assistance strategies were developed to achieve this goal:

- The Northwest Economic Adjustment Initiative (the NEAI), which provided economic assistance to workers and their families, businesses, and communities.
- Payments to states legislation, designed to stabilize payments to counties and to compensate for reductions in payments traditionally tied to federal timber receipts.
- Removal of tax incentives for the export of raw logs.
- Assistance to encourage growth of, and investment in, small businesses and secondary manufacturers in the wood-products industry (Tuchmann et al. 1996: 141).

This section focuses on the NEAI and treats the last of the assistance strategies as one of its components. Payments to states and counties are addressed in the next section. This monitoring report does not examine the effects of the export tax incentive change put in place in 1993.

The Forest Service is not an economic development agency and cannot be expected to function as such. Nevertheless, it has long been committed to providing people in communities that surround federal forest lands with socioeconomic benefits from the national forests, thereby contributing to socioeconomic well-being. Community economic assistance programs are one way of doing this. The economic assistance package, designed to mitigate the effects of the Plan on people, communities, and businesses that were economically dependent on the wood products industry, was a central component of the Plan.

Monitoring Question—How did the Klamath National Forest assist with long-term economic development and diversification in rural communities affected by cutbacks in timber harvest on federal forest lands and what were the outcomes?

In the early 1990s, the KNF administered grants to support economic diversification projects in local communities that totaled roughly $55,000 per year. The NEAI brought $2,272,000 in grant money to the KNF over 9 years, representing 16 percent of the total NEAI funding received by Forest Service Region 5. During this period, the KNF

averaged $217,000 per year in grant money, with a high of $478,000 in 1994, and a low of $50,000 in 1999 and 2000 (fig. 28). The amount of money available each year depended on budget allocations from Congress. The bulk of the NEAI money became available during the first 4 years of the Plan. Rural Community Assistance grants made up the vast majority of this funding. These grants were often used by communities to leverage money from other sources through matching grants and other means, so that the total benefit they provided was far beyond their face value. Not only did the NEAI provide economic assistance to communities, the way in which it was administered caused new collaborative relationships to form between the agency and communities.

In Butte Valley, federal grant money to support economic and community development, and small business loans—some of which came through the initiative—were critical for helping local businesses survive. In Scott Valley, the effectiveness of initiative funding and Rural Community Assistance grants received mixed reviews. They were believed to be helpful in funding specific projects and infrastructure developments, but their long-term success was believed to be limited by inconsistent commitment and followup on the agency's part. Initiative money was not viewed as helping former timber workers adapt to changing job markets because most of the workers had lost their jobs and left by the time the funding arrived.

The Mid-Klamath community received a substantial amount of initiative funding in the mid-1990s. Tobe et al. (2002) studied how effective that funding was. The Karuk were able to secure $1.86 million in initiative funds, and the community secured additional funds through other mechanisms. Numerous planning activities took place, and several projects were initiated, roughly one-third of which were natural-resource-based (such as a small hardwood mill and a furniture business). Tobe et al. (2002) found that the initiative did increase the physical infrastructure and financial capital of the community. The initiative also provided job training and skills development, but it did not lead to creating significant local jobs. Instead, retrained

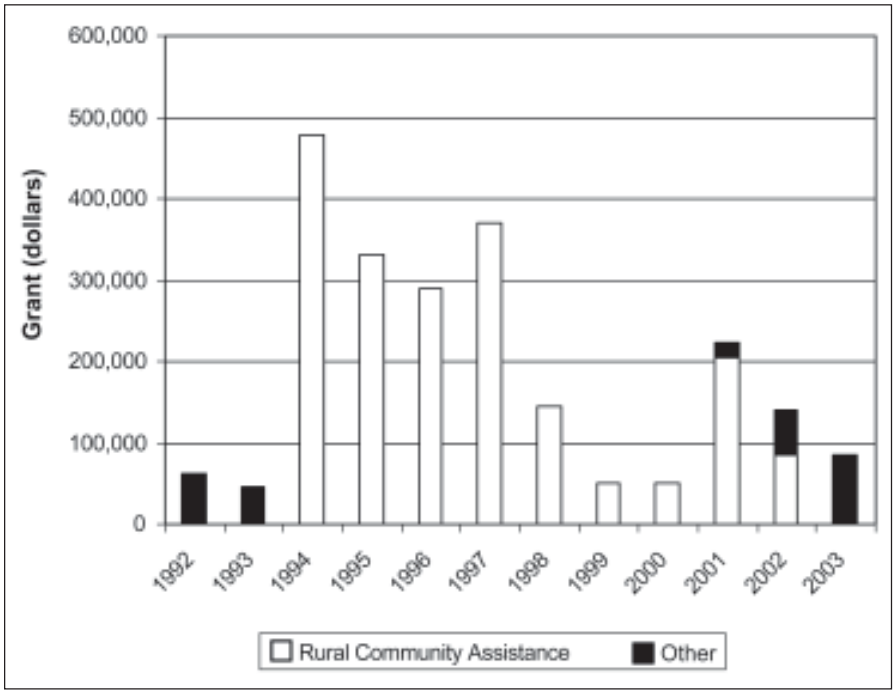


Figure 28—Economic program grants to communities, Klamath National Forest, 1992–2003.

workers had to move away to find new jobs. Nor did it build leadership capacity in the community to replace what was lost when timber workers moved away. What new businesses were created could not absorb displaced timber workers, who benefited little from the initiative programs. The Forest Service did not create the job opportunities hoped for, or provide the raw materials required to make new value-added wood-products businesses successful. The main criticism of the initiative reported by interviewees was that it provided one-time funding for projects, but these projects were not linked together to create long-term, sustainable jobs for local residents. And the funding ran out too quickly to be effective.

More recently, as Rural Community Assistance funds dwindled, two new grant programs became available to communities through the National Fire Plan—the Economic Action Program and the Community Protection Program. The Community Protection Program is aimed at removing fuels from private lands. The Economic Action Program focused on finding long-term solutions to fuels problems, including community fire plans and developing economic uses for forest fuels. Economic Recovery grants also became available on the KNF in 2003. However, the forest has to compete with other national forests in California for these funds. Overall, the amount of grant money available on the KNF dropped sharply with the end of the NEAI funds.

Payments to County Governments

Shared revenues generated by the sale of timber and other goods and services from federal lands are important sources of funds for local governments. Historically, 25 percent of gross timber receipts from the sale of Forest Service timber has been returned to counties as compensation for revenues foregone because the lands and resources are not in private ownership. Under the Payments to States Act of 1908 (Public Law 60-136 as amended), these payments are for public schools and local roads. State legislatures decide on the actual division of funds. In California, the split is 50:50.

Timber receipts, which include purchaser road credits, Knutsen-Vandenburg Act (KV) collections for sale area restoration, and salvage sale fund payments, are by far the largest source of revenue. They exceeded 99 percent of all revenues collected during the early 1990s and dropped to 95 percent by the end of the decade. Other revenues generated by the sale of natural resources from federal lands include collections for developed recreation, mineral leasing, special uses, and grazing permits.

Northern California was affected by the drop in federal timber harvest and associated timber revenues resulting from administrative and judicial decisions designed to protect the northern spotted owl and other ecosystem components. For 1991-93, Congress annually invoked stop-gap measures to mitigate the reduction in revenue to affected counties in northern California, including Siskiyou County. Congress passed the Omnibus Budget Reconciliation Act of 1993 to provide a longer lasting alternative payment. All of these alternative payments are known as the "spotted owl safety net" or "owl guarantee" payments. Under the act, counties received a declining percentage of the 1986 through 1990 average annual payment; payment began in 1994 at 85 percent of the 5-year average and was to decline by 3 percent each year through 2003, when it would reach 58 percent. Between 1999 and 2003, counties would receive either their percentage from the act, or their revenue-sharing percentage from gross receipts, whichever was higher. The owl guarantee payments under this act were to expire in 2004.

In 2000, Congress replaced this spotted owl safety net with the Secure Rural Schools and Community Self-Determination Act (Public Law 106-393), which would expire in 2006. Under this act, counties receive an annual payment equal to the average of the payments received during the three highest years between 1986 and 1999. This act provided alternative payments to counties nationwide that historically shared revenues from goods and services sold from Forest Service lands. The national forest component stipulated that at least 85 percent of this money (Title I) must be used to fund education and transportation projects. The remaining 15 percent was to be used to fund resource advisory committees (RACs) and their activities (Title II), and general county budget needs (Title III).

The RACs were established by the act to promote collaborative relations and to advise the Secretaries of Agriculture and Interior on the use of Title II funds. The advisory committees include 15 members representing a balance between the environmental community; industry, commodity, and recreation interest groups; and government officials, educators, and members of the public. The advisory committees review and recommend projects and associated funding proposed by willing federal agencies, state and local governments, private and nonprofit entities, and landowners. The projects must focus on enhancing or restoring forest ecosystem health (including water quality), promoting land stewardship, or maintaining or improving existing infrastructure. The projects can be on national forest land, Bureau of Land Management (BLM) land, Oregon and California Railroad land, and Coos Bay Wagon Road land, or on nonfederal land where they would benefit federal land.

In addition to revenue sharing, counties receive payments in lieu of taxes (PILT) based on the amount of eligible federal land in each county. The payment amount is determined based on a formula that includes population and the amount of prior-year revenue sharing. In 1994, Congress passed legislation to increase the payment amounts calculated in the formula and added an annual inflation increase (Schuster 1996). These payments are funded directly through congressional appropriations, but Congress typically does not fully fund PILT. Funding varies year to year and is generally about 50 percent of the calculated amount. These PILT payments are important to county governments. The payments in lieu of taxes were generally not affected by the Plan's implementation that reduced timber harvest, because the owl guarantee legislation and the Secure Rural Schools Act mitigated the loss in timber revenues.

Monitoring question—Did payments-to-counties legislation stabilize payments to county governments from the Klamath National Forest and compensate for payments traditionally tied to timber receipts?

Figure 29 summarizes the downward trends in forest collection receipts that occurred on the KNF between 1988 and 2002. Timber receipts (including purchaser road credits, KV collections, and salvage sale fund payments) were by far the largest source of revenue to the KNF during the 1970s and 1980s. Revenues generated by nontimber programs were meager compared with those that had come from the timber program. This underscores the importance of mitigation measures. Figure 30 shows the amount of money county governments received from the KNF between 1990 and 2002 (99 percent to Siskiyou County and 1 percent to Jackson County). The lower line on the graph represents the amount that county governments would have received based on 25 percent of the KNF collection receipts alone, without the mitigating legislation. The upper line indicates the amount of money that county governments actually received under the owl safety net payments and the Secure Rural Schools Act. The spotted owl safety net measures resulted in substantially higher payments to counties than they would have received through forest revenue sharing alone, in many cases at least doubling this amount. The Secure Rural Schools Act has provided the highest level of payments to counties since 1990.

In addition to being an important source of revenue to support roads and schools countywide, payments to counties under the Secure Rural Schools Act have contributed a significant amount of money to support local resource-related projects on and around the KNF. The Siskiyou County RAC has been a major source of funding for collaborative forest stewardship projects. It has made over $1.7 million available for resource-related projects on both private and national forest lands in the county during 2001–03 ($336,432 in 2001, $678,248 in 2002, and $686,387 in 2003). The RAC money not only promotes forest stewardship; it is an important source of new grant money to communities that have seen NEAI funds largely disappear.

Summary of Trends

What are the overall trends in socioeconomic benefits flowing from the KNF since 1990? In terms of resource outputs, the most significant trend has been the drop in timber

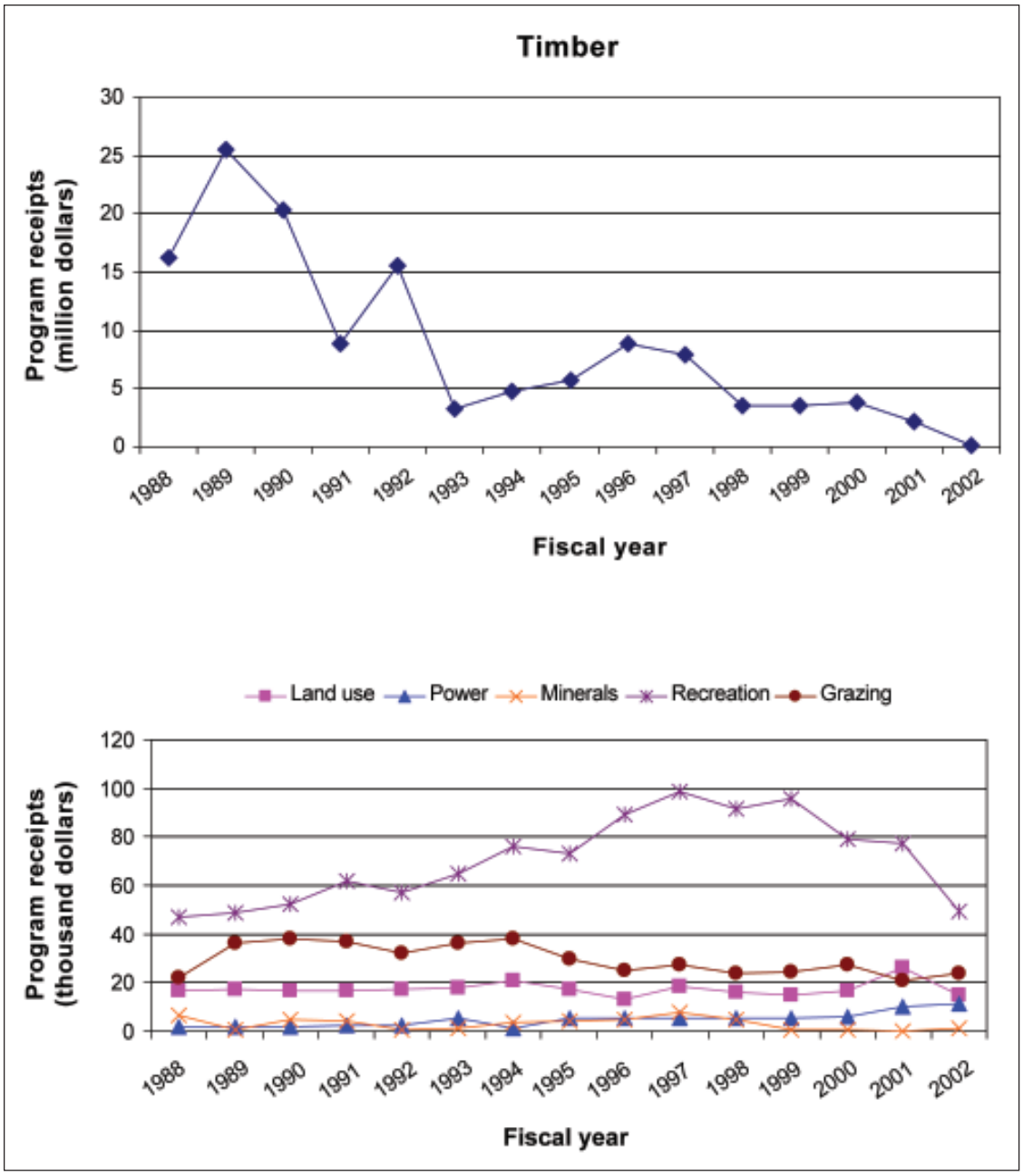


Figure 29—Klamath National Forest collection receipts by program area, fiscal years, 1998–2002.

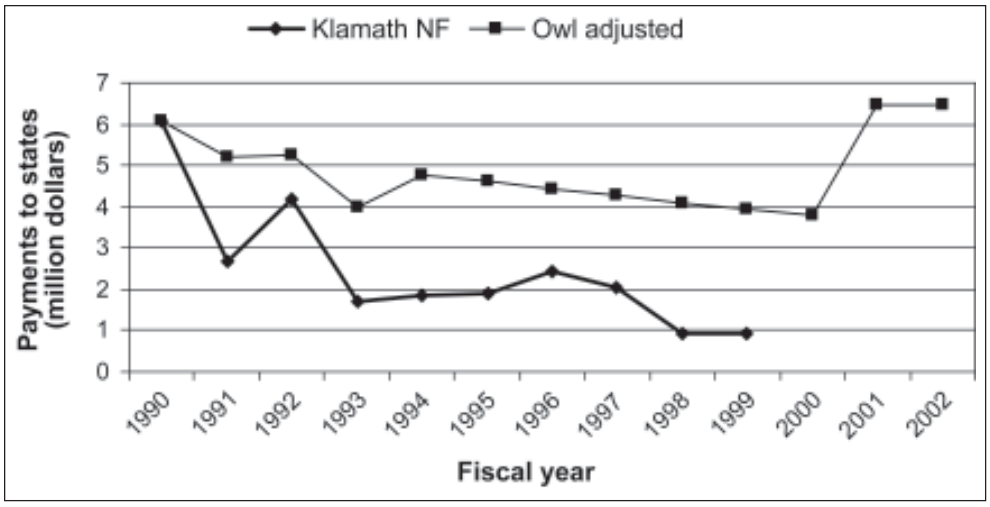


Figure 30—Klamath National Forest payments to states, fiscal years 1990–2002.

harvest activity from a high of 306.5 million board feet in 1990, to a low of 10 million board feet in 2002. Associated with that decline was a substantial drop in timber revenue generated by the forest, from $25.6 million in 1989 to $186,500 in 2002. The decline of the KNF timber program triggered declines in the KNF budget and jobs. The number of jobs dropped by roughly 31 percent between 1993 and 2003. The total forest budget dropped by about 18 percent between 1993 and 2002. These trends also triggered the consolidation of three of the forest's district offices.

There were also drops in the production of convertible special forest products (fuelwood and Christmas trees), although fuelwood is still important for heating. Other special forest products activity on the forest has either declined or been inconsistent. There has been a recent surge in mushroom harvest activity (mainly matsutake), but these reportedly do not provide much in the way of economic opportunity to local residents. Most harvesters and buyers come from outside the area. Commercial mushroom harvesting has created conflict with Karuk tribal members, who value mushrooms for personal and cultural uses. Other special forest products on the KNF also have cultural importance to tribal members.

Grazing activity declined slightly. Minerals activity (salable and locatable) also declined somewhat between 1990 and 2002, as did associated revenues to the forest. Recreational mining increased. The KNF recreation program has remained fairly stable, with reported increases in river rafting and backcountry use, and a slight decrease in roads and associated recreation opportunities. Recreation revenues rose slightly overall during the course of the study period, although they have dropped off since 1999.

Timber was reported to be the single biggest determinant of the KNF budget prior to the Northwest Forest Plan. In recent years, continued declines in the base program budget have been somewhat offset by increases in fire money. However, the declining budget has had an impact on contracting opportunities to do work on the KNF. The drop in annual procurement spending for ecosystem management work on the KNF during the study period was substantial. Emergency money made available through ERFO following the 1997 flood was the one factor countering this trend.

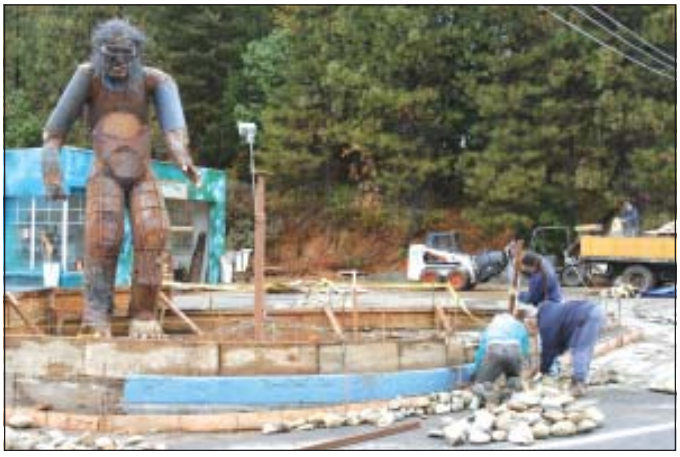
Two important mitigation measures designed to offset the negative economic effects of declining timber harvests on communities were associated with the Plan. Owl guarantee payments caused payments to county governments to decrease slowly rather than abruptly during the 1990s. The Secure Rural Schools and Community Self-Determination Act has stabilized these payments. Both measures have helped buffer the impacts of declining timber receipts on county governments.

Community Economic Assistance programs made available by the KNF increased substantially between 1994 and 1998 as a result of the NEAI. Now that Rural Community Assistance funds have dwindled, the economic assistance money available to communities through the KNF has essentially returned to pre-Plan levels. The Forest Service Economic Action Program is no longer funded. However, forest communities have had the opportunity to benefit from new sources of funds made available through RACs as part of the Secure Rural Schools and Community Self-Determination Act, and can also obtain money through the National Fire Plan. It is uncertain whether these will be reliable sources of economic assistance money in the future. The Secure Rural Schools Act expired in 2006. A 1-year extension was passed in 2007, but reauthorization is uncertain.

Partnership agreements between the KNF and collaborating federal, state, and nonfederal entities provide another potential source of employment to community residents. Although partnership agreement data were not available for the years prior to 2002, recent data indicate that the KNF is putting the same, if not more, money into agreements as it is into procurement contracts for ecosystem management activities. If considered together with the money leveraged through partners, the value of agreements money now exceeds that of contracts.

Nevertheless, the overall picture is one of declining community economic benefits from the KNF since the Plan was adopted. The economic benefits associated with resource and recreation outputs, agency jobs, and contracting declined sharply between 1990 and 2002. Payments to county governments have stabilized, at least for the near term. There was a substantial increase in community economic assistance money during the mid-1990s, but this has now returned to pre-Plan levels. Partnership agreement money and RAC project money provide two additional sources of economic opportunity for communities. The RAC money was new in 2001 but it's future is uncertain. No trend data were available for agreements, but forest interviewees reported a growing tendency to put money in these vehicles as compared to contracts.

Chapter 3: Community-Level Change and the Effects of the Northwest Forest Plan



This chapter responds to the socioeconomic monitoring question posed in the Northwest Forest Plan Record of Decision (ROD): Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management? We focus on three case-study communities associated with the Klamath National Forest (KNF) (Scott Valley, Butte Valley, and Mid-Klamath), using them to look closely at three things: (1) how communities around the KNF have changed since 1990 and how changes in forest management and the flow of socioeconomic benefits from the KNF under the Northwest Forest Plan (the Plan) contributed to that change, (2) how communities have adapted to change brought about by federal forest management policy and the role the KNF has played in helping them do so, and (3) changing relations between the KNF and the case-study communities since 1990. The information in this chapter comes mainly from the U.S. census and interviews with community members.

To put the case-study communities in perspective, we examined changes in socioeconomic well-being that occurred between 1990 and 2000 in all of the communities (as defined for purposes of this monitoring program) lying within 5 miles of KNF boundaries using a well-being index that was calculated on the basis of six U.S. census indicators (see Donoghue and Sutton 2006): percentage unemployment, percentage of the population living below the poverty level, household income inequality, percentage of the population 25 years and older having a bachelor's degree or higher, average travel time to work, and diversity of employment by industry. This index serves as a coarse indicator of change in socioeconomic well-being that occurred in communities around the KNF since 1990. Of the 37 communities that lie within 5 miles of the KNF, 4 (10.8 percent) had socioeconomic well-being scores that increased, 19 (51.4 percent) had decreases in socioeconomic well-being scores, and 14 (37.8 percent) showed little change in their scores between 1990 and 2000. On average, the 37 communities' socioeconomic well-being score dropped from medium (62.6) to low (56.7) between 1990 and 2000.[1] This chapter provides a much more detailed quantitative and qualitative analysis of this change.

Scott Valley

Scott Valley lies in central Siskiyou County about 35 miles south of the Oregon border (fig. 31). The north-south-oriented valley is about 30 miles long and 7 miles wide, and is surrounded by mountains. Most traffic into and out of the valley is over a mid-elevation mountain pass to Yreka, 15 miles north of the valley on the Interstate-5 corridor. Among the mountains around Scott Valley are the Trinity Alps Wilderness, the Russian Wilderness, and the Marble Mountain Wilderness. The Trinity Alps Wilderness lies across the boundaries of the Klamath, Shasta, and Six Rivers National Forests beyond the valley's southern end. The other two wilderness areas lie within the western half of the 1.7-million-acre KNF, which curves around the valley's southern and western flanks at elevations ranging from 3,200 to over 8,000 feet (USDA FS 1997). Sections of Bureau of Land Management (BLM) land are scattered across the lower, drier mountains that make up Scott Valley's eastern flank. The view across the valley is pastoral, with irrigated pasture on the flat, green valley floor backed by range upon range of rugged mountains to the west.

The Scott Valley community area was identified by area residents as including the geographic extent of the valley up to the surrounding mountain peaks. The community includes a number of small towns that together had a population in 2000 of 5,100. The entire north-south string of valley towns—Fort Jones, Greenview, Etna, and Callahan–were seen as essential components of the valley community. Cheeseville, although identified on the census map, effectively no longer exists. The Quartz Valley-Mugginsville-Oro Fino Valley to the west was considered

[1] Community socioeconomic well-being scores were classified as follows: very low (0 to 48.72), low (48.73 to 61.07), medium (61.08 to 73.36), high (73.37 to 85.58), and very high (85.59 to 100).

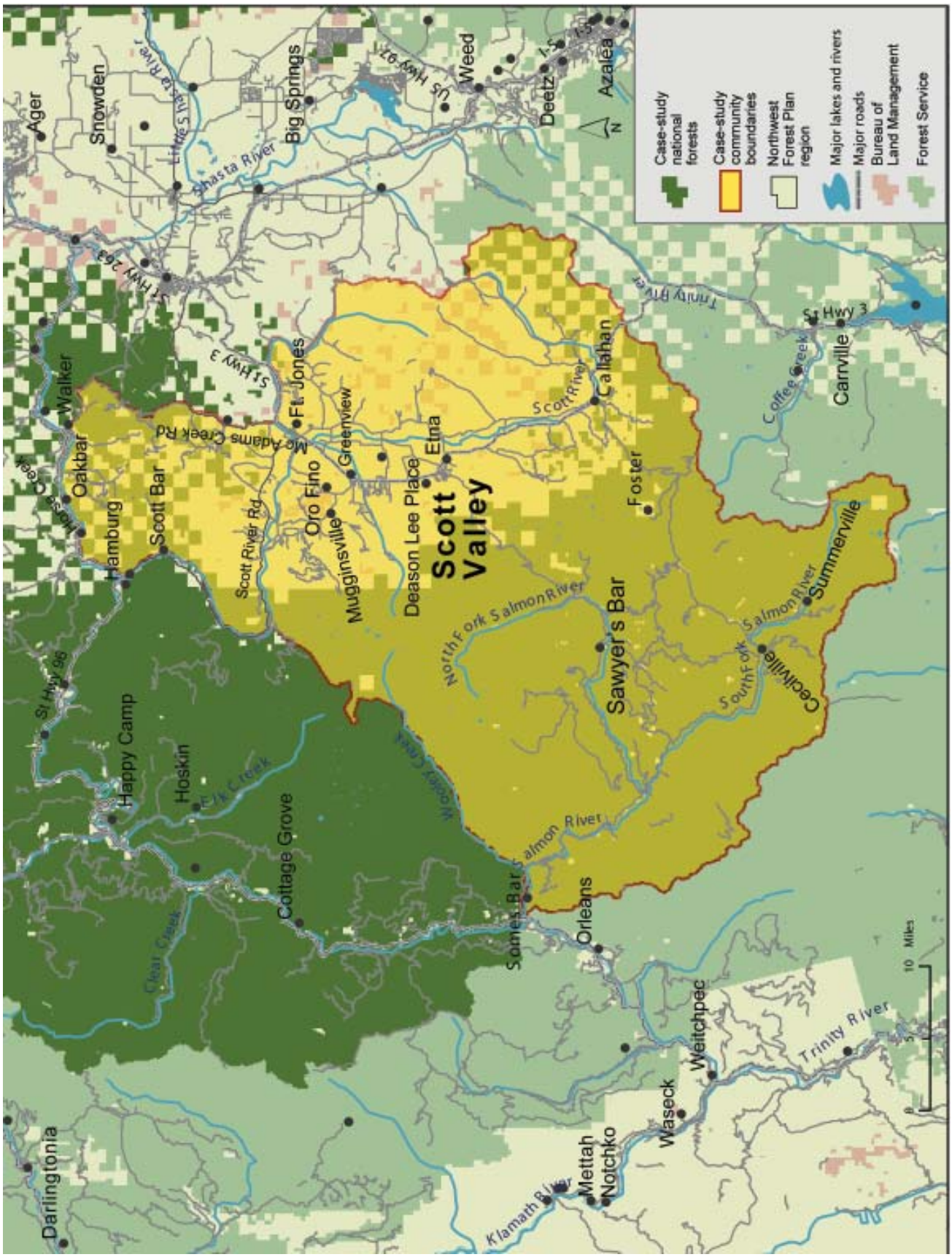


Figure 31—Scott Valley.

by interviewees to be part of the Scott Valley community. Residents suggested that the headwaters of the North Fork of the Salmon River, particularly the Sawyer's Bar area, also be included, as they believed that residents in that area sought most of their services within Scott Valley. However, owing to the community delineation protocol adopted by the monitoring program, the final Scott Valley community delineation also includes large tracts of land and census-designated places that were not considered by residents to be part of the community. These include Cecilville, Summerville, and parts of the Salmon Mountains to the south, as well as Scott Bar and Klamath River communities such as Horse Creek and Steelhead to the north.

Fort Jones at the Scott Valley's northern end, and Etna at its southwest edge, are the largest towns within the valley. Fort Jones (pop. 660) has several primary schools, housing, a few restaurants and stores, a number of other businesses, a museum of local history, and a Forest Service district office. Etna (pop. 781) holds historical homes, a small downtown with a number of businesses, a public library, and primary and high schools. A Forest Service district office in Etna was closed during the study period. Greenview (pop. 200), Mugginsville, and Callahan are smaller villages scattered within the valley. Sawyer's Bar is a tiny, remote community in the rugged mountains to the west, along the North Fork of the Salmon River. The village of Sawyer's Bar has no businesses, but retains a post office and a small Forest Service work station that hosts a firefighting crew. A school in the Sawyer's Bar area closed during the study period. The other small towns in the area were not identified by Scott Valley residents as part of their community. Stakeholders and residents of these areas were therefore not sought for interviews, although they are represented in the census statistics.

The valley is part of the ancestral territory of the Shasta Tribe, which today includes about 1,500 people. About half of the tribe members live within 100 miles of Yreka. The other half reside in Oregon or Washington. Most families include at least one member who still lives in ancestral territory, and other members return often to visit or for tribal gatherings. Many tribe members continue lifestyles with a close connection to the land.

Gold mining, agriculture, logging, and ranching have been the area's primary uses since European settlers entered around the 1830s. This history remains alive, with descendents of pioneering settler families still prominent in the area. Gold brought many of the original settlers to the Scott Valley, and was mined in hard rock mines as well as the Scott River and its tributaries. Extensive dredger tailings from these activities remain at the valley's southern end.

The floor of the valley historically has been dedicated to ranching, with a dominant presence today of irrigated agriculture. Cattle pastures and irrigated alfalfa cover most of the valley floor. The alfalfa hay is fed to local cattle, or is sold and apparently trucked throughout California and the West. Most of the remaining bottomland is used to pasture cattle, some of which are summered on the KNF's grazing allotments. Sugar beets and other crops may also be farmed on the valley floor.

For 150 years, logging also occurred on the slopes surrounding the valley. Privately owned commercial forest lands lie between the valley bottom and the national forest land along the valley's western and southern extents. Most of these lands are owned by two commercial timber companies: Timber Products (formerly Sierra Pacific) and Fruit Growers Supply. A large Oregon-based commercial timber grower (Roseburg Forest Products) owns a much smaller land base within the valley. Timber harvest within the area is supplemented by smaller private landowners (USDA FS 1997).

Small-claim mining, ranching, and logging, all historically central to the area's economy, are occupations entailing individual risk and requiring personal initiative and hard physical labor. These are traits valued in the Scott Valley today. Inhabitants of the valley adhere to a tradition of rugged individualism and independence. Interviewee comments made it clear that hard work and individual initiative are strongly valued, with personal freedom perhaps most highly prized.

Despite the economic and political pressures associated with living in a relatively remote, rural community, residents say that they would much prefer to live in Scott Valley than elsewhere. Ranchers and loggers cite multiple generations of their families closely tied to the land, with no desire to leave the woods or the valley. Tribe members cite thousands of years of local residence, and of accumulating a deep understanding of and connection to its natural rhythms and processes.

Residents express a feeling that the valley is a strongly rural place, one with a powerful and living connection to its history. They value the intergenerational traditions of the valley. Most want to see their community's rural culture protected. The valley seems removed from the faster-changing world beyond the surrounding mountains, and residents want to keep it that way.

Community Change and the Role of Forest Management Policy

The population of the Scott Valley community remained constant at around 5,100 people between 1990 and 2000 (table 7). Change in the racial composition of the local population between 1990 and 2000 cannot be measured because the U.S. census collected these data differently in 1990 and 2000. However in 2000, about 89 percent of the Scott Valley population was Caucasian. American Indians composed another 6 percent. The number of African Americans and Asian and Pacific Islanders was under 1 percent. Hispanics accounted for 3.7 percent of the population in 2000.

What did change between 1990 and 2000 was the median age of Scott Valley residents. Median age rose from 33.3 in 1990 to 44.5 in 2000, a 34 percent increase (table 7). This magnitude of change was greater than that in Siskiyou County as a whole, where median age rose by about 16 percent. The shift resulted from a substantial loss of residents under age 44 (most notably people in the 0-to-4 and the 30-to-44 age groups) (table 8). By contrast, the 45-to-64 age class increased by 47 percent during this same period. The 65-and-older age class also gained members.

Despite the loss of youth, census data indicate that school enrollment in the year 2000 was nearly the same as it was in 1990 (table 9). We do not know why the school enrollment data do not reflect this population decline. The number of residents that had completed high school rose slightly between the two periods, as did the number of residents that held BA degrees or higher.

Median household income in Scott Valley rose 9.5 percent between 1990 and 2000, consistent with the increase that occurred countywide (table 10). Table 11, which shows income distribution, indicates that the number of households earning $35,000 per year or less dropped during the decade, while the number of households having incomes over $35,000 per year increased. The number of households earning $75,000 or more increased sharply between 1990 and 2000, such that 15 percent of Scott Valley households were earning over $75,000 per year by 2000. In contrast to Siskiyou County as a whole, the percentage of people living in poverty in Scott Valley declined by 10 percent. The rise in unemployment that occurred in Scott Valley was much higher than that throughout the county (table 10).

Figure 32 compares changes in employment by industry that occurred in Scott Valley between 1990 and 2000. The total number of Scott Valley residents employed increased over the decade, from 1,876 to 1,975. Manufacturing jobs dropped from 14 percent to 4 percent of employment by industry. The most job growth occurred in retail and wholesale trade and in the education, health, and social service sector. The public administration sector, and the finance, insurance, real estate and rental, and leasing sector also grew. The largest employment sectors in Scott Valley in 2000 were agriculture, forestry, fisheries, hunting, and mining; education, health, and social services; professional and other services; and retail trade (containing 19, 21, 15, and 12 percent of the total jobs, respectively).

Table 7—Scott Valley population, 1990 and 2000

Indicator	1990	2000	Change
			Percent
Total population, Scott Valley	5,100	5,126	0.51
Total population, Siskiyou County	43,531	44,301	1.77
Population by race, Scott Valley			
Caucasian		4,553	
African American		1	
American Indian		295	
Asian and Pacific Islander		48	
Others		49	
2+ races		180	
Percentage of population that is Hispanic (%)		3.7	
Median age, Scott Valley	33.3	44.5	33.63
Median age, Siskiyou County	37.2	43	15.59

Table 8—Age distribution, Scott Valley population, 1990 and 2000

Age distribution	0–4	5–19	20–29	30–44	45–64	65 and up
1990 Scott Valley	332	1,264	367	1,317	1,061	759
2000 Scott Valley	227	1,116	313	948	1,556	966
Change (percent)	-31.63	-11.71	-14.71	-28.02	46.65	27.27
1990 Siskiyou County	2,993	9,746	4,182	10,546	8,867	7,197
2000 Siskiyou County	2,273	9,425	3,591	8,318	12,615	8,079
Change (percent)	-24.06	-3.29	-14.13	-21.13	42.27	12.26

Table 9—Education indicators, Scott Valley, 1990 and 2000

Indicator	1990	2000	Change
			Percent
School enrollment, Scott Valley	1,112	1,104	-0.72
School enrollment, Siskiyou County	8,680	9,091	4.74
Completed high school, Scott Valley (percent)	81.23	87.42	7.62
Completed high school, Siskiyou County (percent)	77.36	83.78	8.30
BA, graduate, professional degrees Scott Valley (percent)	17.40	20.28	16.55
BA, graduate, professional degrees Siskiyou County (percent)	14.17	17.75	25.26

Table 10—Economic indicators, Scott Valley, 1990 and 2000

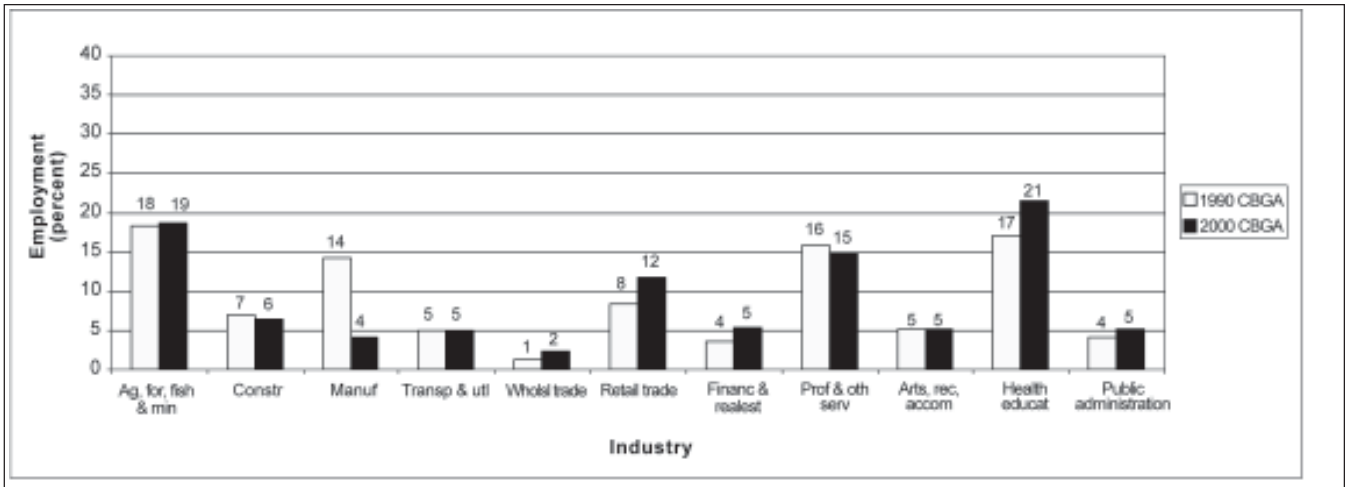
Indicator	1990[a]	2000	Change
			Percent
Median household income, Scott Valley	27,888	30,545	9.53
Median household income, Siskiyou County	27,204	29,530	8.55
Unemployed, Scott Valley (percent)	7.95	9.32	17.23
Unemployed, Siskiyou County (percent)	9.37	9.55	1.92
Poverty, Scott Valley (percent)	16.50	14.78	-10.42
Poverty, Siskiyou County (percent)	13.99	18.56	32.67

[a] Median household income has been adjusted for inflation and is reported in 2000 dollars.

Table 11—Household income distribution, Scott Valley, 1990 and 2000

Household income distribution	<$10,000	$10,001-$14,999	$15,000-$24,999	$25,000-$34,999	$35,000-$49,999	$50,000-$74,999	$75,000-$99,999	$100,000-$149,999	$150,000 and up
1990									
Scott Valley	385	269	383	365	276	184	30	23	14
2000									
Scott Valley	305	242	381	216	367	300	169	110	44
1990 county	3,349	2,361	3,945	2,733	2,472	1,560	414	279	120
2000 county	2,691	1,960	3,577	2,369	3,129	2,711	1,075	683	378

Note: These data are not adjusted for inflation.



Employment by industry	Agriculture, forestry, fishing, hunting, and mining	Construction	Manu-facturing	Transportation, warehousing and utilities	Wholesale trade	Retail trade	Financing insurance, real estate and rental, leasing	Professional and other services	Art, recreation accommodation and food services	Health, education and social services	Public admini-stration
1990	345	129	267	95	22	156	67	298	98	321	78
2000	368	126	79	98	44	231	107	291	103	424	103
Change (percent)	6.67	-2.33	-70.41	3.16	100.00	48.08	59.70	-2.35	5.10	32.09	32.05

Figure 32—Employment by industry, Scott Valley, 1990 and 2000.

Scott Valley's socioeconomic well-being score dropped from medium (62.6) to low (56.7) between 1990 and 2000. This score was slightly lower than average for the 37 communities within 5 miles of the KNF.

In what ways do census data reflect changes in the nature of the Scott Valley population between 1990 and 2000? Interviewees stated that most of the timber workers that still lived in the community in 1990 left with their families in the early 1990s. This departure was a direct result of the cutbacks in timber harvest that occurred on the KNF at this time, according to interviewees. Many welfare recipients (another long-term segment of the local population) and people living on unemployment also moved away in the mid-1990s, when their benefits apparently ran out and they had to search for jobs elsewhere. The movement of this sector of the population was not considered to be related to the Plan. The exodus of community residents and their families caused some schools to close or consolidate, and caused a loss of support to the service and business sectors of the community. When timber workers and their families moved away, housing prices slumped briefly. This attracted the attention of young retirees from urban areas, and older, mobile, high-earning workers. These kinds of people began to move into the Scott Valley area, and housing prices have since risen dramatically as a result. The influx of relatively well-off urban retirees and mobile workers may account for the rise in median income, and the shift in income distribution seen in the census data.

Interviewees stated that changes in timber production on the KNF in the years immediately preceding the Plan had a dramatic impact on the community's timber workers, forcing most of those who had not already left to do so. Between 1994 and 2002, the mills that remained in the Scott Valley area closed down, with some 145 mill jobs lost as a result. The departure of timber industry

workers caused families to break apart across generational lines, as younger workers had to leave their aging parents to find work in other areas. A great deal of grief, anxiety, anger, and frustration accompanied this change. Not all timber workers left the area, however. Some retired, some got lower paying jobs in the service sector, and some continued to work in the industry, but commuted long distances to find work, or worked intermittently.

Eighteen percent of the forest land in Siskiyou County is owned by the private forest industry (USDA FS 2004). Although Fruit Growers and Timber Products own private industrial timber lands on the mountain slopes above the valley floor, community interviewees stated that these did not provide any meaningful alternative source of employment for Scott Valley timber workers once timber harvests on the KNF declined. Private industrial timber landowners in northern California have found it difficult to continue operating there owing to the loss of timber industry infrastructure and California state regulations that put a burden on their businesses, making it costly to operate. Several companies have moved operations across the border to Oregon, where the business climate is more favorable for the timber industry. This exacerbates the impact of job loss associated with federal timber cutbacks on rural communities like Scott Valley.

Ranchers in the Scott Valley community have also been undergoing stressful times over the last decade, and are having a difficult time maintaining their way of life. The pressures come from many sides: flat beef prices in the face of rising labor costs, rising production costs, drought, and the 1997 listing of the coho salmon (*Oncorhynchus kisutch)* as a threatened species. The coho listing is expected to affect local water management and could threaten the use of water by farmers and ranchers who irrigate pasture on their private ranches, and grow alfalfa for the market.

An estimated six Scott Valley ranchers have grazing allotments on the KNF. Changes in forest management under the Plan have added to the other pressures they face. For these permittees, Forest Service allotments play a critical role in their overall livelihood strategy. However, grazing under the Plan has added to their production costs. Recent drought, combined with stricter rules regarding the use of riparian areas under the Aquatic Conservation Strategy, and increased scrutiny of grazing practices under both National Environmental Policy Act (NEPA) and the Plan mean that grazing on the forest has become more labor intensive, as it has to be managed more carefully. Rising labor costs have meant a bigger financial burden on ranchers who hire laborers to assist them, or a shift away from using hired labor to using household labor only, stressing family members. This increased scrutiny has added to the broader climate of uncertainty around the economic viability of ranching, as permittees are insecure about whether they will continue to have their permits renewed. Another concern among permittees is the increased risk of catastrophic fire on the KNF over the last decade owing to the buildup of fuels. This risk has reportedly caused some ranchers to obtain fire insurance for their cattle, adding to the cost of doing business.

The Plan has contributed to a larger set of pressures on Scott Valley ranching families that they described as threatening their way of life. These families have been ranching for generations, and ranching forms the base of their economy, culture, and way of life. However, flat beef prices, rising production costs—in part owing to Plan requirements—and a climate of uncertainty around maintaining access to Forest Service allotments is making it difficult to recruit the younger generations into this way of life. Inflated property values in Scott Valley resulting from the influx of wealthier residents, and high inheritance taxes are decreasing the likelihood that family ranches will be passed on to the next generation. Instead, they may well be sold to wealthy newcomers or subdivided and developed.

Adaptation to Change and the Forest Service Role in Mitigating Plan Effects

Although the nature of the Scott Valley community has changed over the last decade, the community is persisting. Despite job loss in the early 1990s and a downturn in the local economy, the community rejected a proposal to site a prison in Siskiyou County in the mid-1990s, although it would have provided jobs. Scott Valley's proximity to Yreka and the Interstate-5 corridor means that commuting to jobs outside the community is a more viable option than it is for more remote communities around the forest. The Scott Valley also has a relatively diversified natural-resource-based economy. The ranching and agricultural sectors, although under stress, are still economically viable. The affordability of the area relative to other parts of California, its great natural beauty and high amenity values, and its proximity to Yreka and Interstate 5 have drawn an influx of retirees and mobile workers into the community who create new demand for businesses and services. These people contribute to the local economy and the community.

Scott Valley has a strong constituency of residents who are highly active in community issues, have strong leadership skills, work to promote economic development in the area, are effective at organizing the community around issues of concern, and want to protect the rural way of life and values that predominate there. Doak and Kusel (1997) undertook a social assessment of the Klamath region to analyze socioeconomic status and community capacity in the greater area of influence of the KNF. Community capacity is the collective ability of community residents to create and successfully take advantage of opportunities to achieve local needs and desires (Doak and Kusel 1997: 10). They found that the Scott Valley towns of Etna and Fort Jones ranked medium-high in their socioeconomic status and community capacity scores (Doak and Kusel 1997: 71–72). Relative to other communities in the area surrounding the KNF, the high level of socioeconomic well-being in the Scott Valley community has been a critical factor in helping it adapt to change.

Interviewees reported that the KNF has played a mixed role in mitigating the effects of the Plan. Local residents expected that diminishing opportunities to benefit from timber harvest on the KNF would lead to increased investment in recreation and tourism development. These expectations have not been met. According to several interviewees, not only had the KNF failed to work with the community to develop recreation and tourism options; but it couldn't maintain the existing recreation opportunities. For example, the KNF had yet to clear and open a large number of wilderness trails in the Scott Valley area closed by a timber blowdown that occurred during a storm in 1997. Local outfitters said the KNF could not respond to their requests to address problems relating to recreation use on the forest that degrade the wilderness experience (and potentially undermine their business interests) because it did not have the staff. However, the lack of investment in recreation and tourism development may also be related to the area's relative remoteness and limited demand.

Regarding contracting, survey-and-manage species requirements provided some opportunities for local residents. Some interviewees praised the KNF for supporting training and economic development opportunities in the area of technical contracting. Much of this work was accomplished through support for a local nonprofit organization whose trainees worked on the KNF doing surveys, restoration work, geographic information system (GIS) analysis, and other analyses. This local nonprofit organization had graduated 68 trainees since 1995, although most of these were not displaced timber workers. Eighty percent of the graduates have been successful in finding natural-resource-related work, although these jobs have not been local because of a shortage of opportunity; people had to move closer to urban areas to find them. Interviewees believed that longer term government funding to support job opportunities would increase the success of such training programs.

The effectiveness of Northwest Economic Adjustment Initiative (NEAI) funding and Rural Community Assistance grants received mixed reviews. They were believed

to be helpful in funding specific projects and infrastructure developments, but their long-term success was believed to be limited by a lack of long-term followup funding where needed to sustain job creation. The NEAI money was not viewed as helping former timber workers adapt to changing job markets, because most of the workers had lost their jobs and left the community by the time the funding arrived. Grant funding offered through the KNF was viewed by county officials as being essential for supporting its Economic Development Council, and for helping communities develop networks and write and obtain grants from a variety of sources. These grants were critical for sustaining local nonprofit organizations. Notably, several interviewees were aware of development projects that occurred in the community, but did not know these had been funded through the NEAI and were associated with the Plan.

Changing Relations Between Scott Valley and the Klamath National Forest

When the KNF timber program was thriving, the KNF maintained strong relations with that segment of the community that was engaged in timber harvesting and processing. When the KNF timber program dropped off and the Plan was implemented, these ties weakened. The KNF failed to deliver on Plan expectations relating to improvements in recreation and tourism, and meeting timber targets according to its allowable sale quantity (ASQ). Moreover, efforts to mitigate the impacts of the Plan on timber workers were largely unsuccessful. These factors reportedly led to a breakdown in trust between local residents, stakeholder groups, and the Forest Service. With the disappearance of the local timber economy, issues of interest to many of the local residents interviewed shifted away from the national forest and toward other concerns, most notably the coho salmon listing, water management issues in the Klamath Basin, and their potential impacts on agriculture in the valley. Forest management concerns have become increasingly distant from the lives of Scott Valley residents. The reduction in Forest Service presence on the ground resulting from staff cutbacks contributed to a lack of connection between the community and the KNF.

Few people believed that resource extraction from the national forest will ever be an economically viable basis for sustaining the community in the future. They had largely given up on this issue. The KNF was viewed by many as having little ability to contribute to community well-being, and as irrelevant to the ongoing needs of the community. There was limited public awareness of the work the KNF has done to benefit the community, such as NEAI projects.

Several interviewees viewed Klamath forest managers as a valuable source of expertise. The community welcomed opportunities to interact with agency employees and to brainstorm with them on topics relating to resource management and economic development. People wanted to see increased outreach efforts in this regard. However, community members interviewed also felt that forest managers were powerless to take meaningful action in relation to forest management. They believed this was due to the lack of staff and budget, and the overwhelming set of process requirements imposed by the National Environmental Policy Act, the Endangered Species Act, and the Northwest Forest Plan. They also attributed it to management decisionmaking having been removed from the local to the regional level. Because KNF employees were perceived as having their hands tied, and as passive parties in resource management, community members felt it was also necessary to go to regional or national-level decisionmakers to have their needs addressed. This sentiment was shared by both environmental activists and timber industry representatives.

The Shasta Tribe members interviewed did report an adequate working relationship with the KNF, and with few exceptions, reported good relations with KNF employees.

Butte Valley

Butte Valley is an agricultural area in northeastern Siskiyou County that adjoins the Oregon border (fig. 33). The community is bordered by forest and range lands in

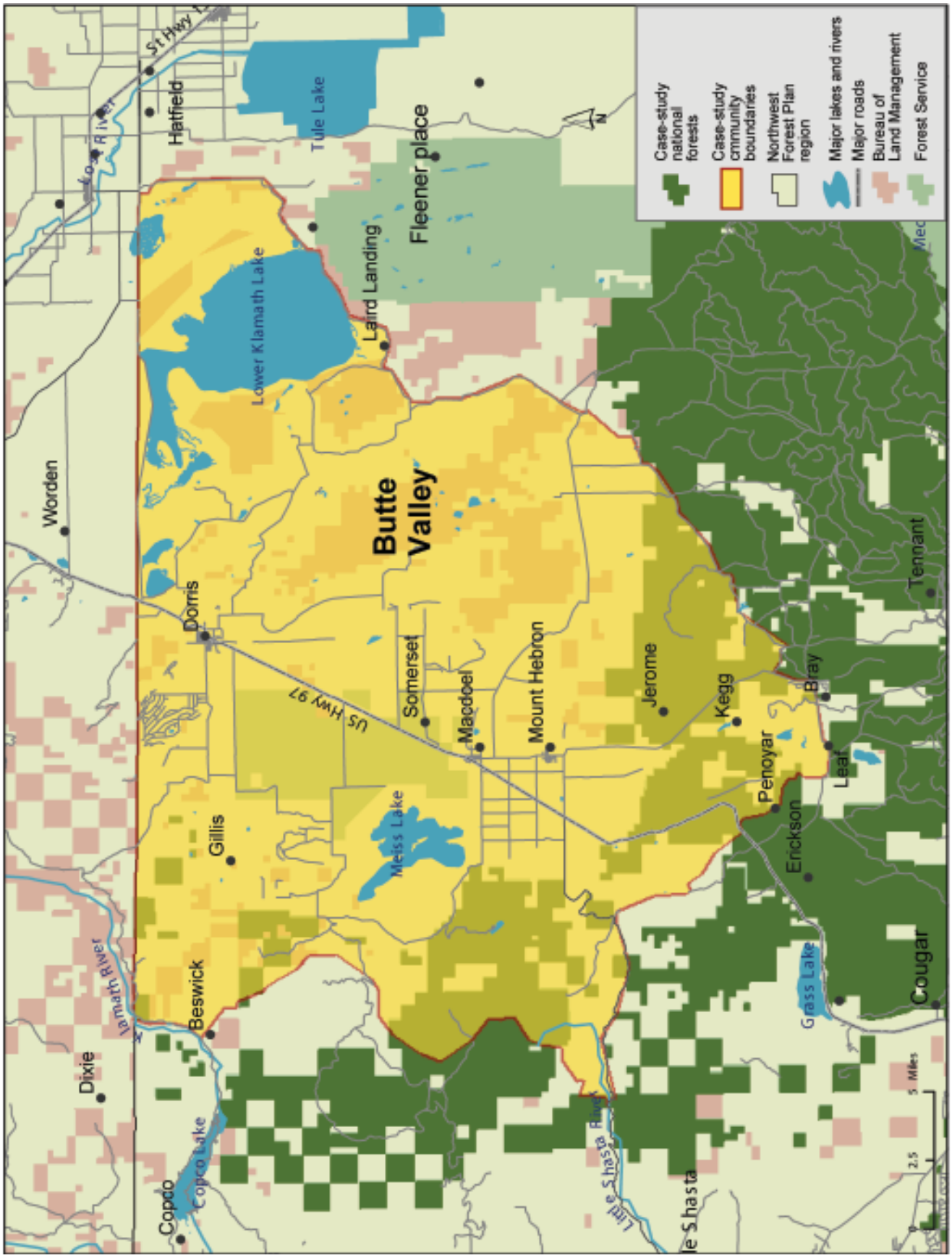


Figure 33—Butte Valley.

mixed private and public ownership. The valley and surrounding areas include the Butte Valley National Grassland (administered by the KNF), the Lower Klamath National Wildlife Refuge, the Butte Valley Wildlife Area, BLM land (administered by the Redding unit), and industrial timberland. The Goosenest Ranger District of the KNF forms the mountainous border of the Butte Valley to the west and south. The KNF acquired large areas of private land through exchanges or donations between 1937 and 1951. A portion of the Butte Valley is in the Goosenest Adaptive Management Area, designated by the Northwest Forest Plan as an area managed for objectives related to forest health, late-successional forest habitat, and commercial timber production.

Butte Valley is part of the ancestral territory of the Shasta Tribe. However, few tribal members live there today. Agriculture now forms the largest employment sector in the Butte Valley. There is a strong ranching component and farming has been important historically. The potato industry thrived in the area for several decades. Major agricultural crops grown since 1990 include hay, potatoes, and strawberries. Forested lands have historically provided grazing and timber-related products to the local economy. The Butte Valley subbasin is a closed hydrologic system. All water drains into the ground or to Meiss Lake, and does not flow to the Klamath River under normal conditions.

The Upper Dorris Census Block Group defined the Butte Valley community for purposes of this study. The city of Dorris is the only incorporated place in Butte Valley, and one of nine incorporated places in Siskiyou County. Dorris contains much of the community population. Dorris is located about 20 miles from Klamath Falls, Oregon, to the north and 50 miles from Weed, California, to the south on Highway 97. Macdoel, Mount Hebron, Bray, and Tennant are unincorporated places within the Butte Valley area. Tennant and Bray were not included in the study area because the boundaries of the census block group, which was selected and validated locally as best representing the Butte Valley Community, did not include them. Fifteen people from Butte Valley were interviewed to obtain the information in this chapter.

As an incorporated city, Dorris has elected officials and a tax base to provide services to its citizens. Macdoel and Mount Hebron are small and dispersed enough that they do not have any organized services specific to their area. Fire protection is provided by two volunteer fire departments, one serving the entire area outside of Dorris. There is a health clinic in Dorris. A unified school district serves the entire area. Klamath Falls, Oregon, is the regional center for manufacturing, professional services, and shopping.

The area surrounding Butte Valley has been logged for about 100 years. At one time, there were several sawmills operating in the area. When long-time residents were growing up, there was a sawmill in Dorris; in the 1950s and 1960s, the mill was the major employer in town. Although much of the forestry work was seasonal, forests supplied work that supported workers and their families who resided in the area and used local services. The mill reportedly closed down about 40 years ago. Since then, logs have been trucked out of the area.

Community Change and the Role of Forest Management Policy

Since 1990, the population of Butte Valley has changed little, remaining at around 1,900 residents (table 12). Seventy-seven percent of the community population was Caucasian in 2000, 6 percent was American Indian, and 16 percent was classified as “other” or 2+ races. The remaining 1 percent of the local population was Asian and Pacific Islander. In 2000, 24 percent of the community’s population was Hispanic. This is much higher than the overall county percentage, which stood at 7.2 percent Hispanic in 2000. The relatively large proportion of Hispanic residents is undoubtedly due to the predominance of agriculture in Butte Valley.

The median age of the Butte Valley population rose much less than it did for Siskiyou County as a whole between 1990 and 2000, from 33.3 to 37.2 (table 12). It is unclear whether this increase was caused by aging of the existing population, or a change in the area's residents. While the number of people in the 45- to 64-year-old age group increased in size by 39 percent, the 30- to 44-year-old age group dropped by 25 percent, and the number of people under age 19 also decreased (table 13). Despite an 11.5 percent decrease in the number of school age children in Butte Valley between 1990 and 2000, U.S. census data show a slight increase in school enrollment over this period (table 14). Census data are inconsistent with those obtained from the Butte Valley Unified School District. According to school district data, there were 379 students enrolled in school in 1999 (compared with the census figure of 473 in 2000), and 302 students enrolled in 2003. This represents a dramatic decline in the student population, which the Butte Valley School District expects will continue. The percentage of the population that had completed high school, and that held BA or higher degrees was slightly higher in 2000 than in 1990. Nevertheless, only 7 percent of Butte Valley residents had a B.A. degree or more in 2000 (compared with 18 percent countywide).

Median household income in Butte Valley increased by 8 percent between 1990 and 2000, and unemployment and percentage of the population living in poverty decreased significantly (table 15). The rise in median household income is reflected by a more than doubling of the number of Butte Valley households earning over $35,000 per year (table 16). The increase in median household income occurred at the same rate as it did countywide. The large drops in unemployment and poverty were counter to the countywide trends, which reflect an increase in percentages of unemployment and households living in poverty in Siskiyou County.

The total number of Butte Valley residents employed rose from 623 in 1990 to 691 in 2000. There was substantial growth in Butte Valley's retail trade sector between 1990 and 2000, with growth also occurring in the arts, recreation, accommodation, and food services sector, and smaller growth in education, health, and social services (in contrast, professional and other services declined

Table 12—Butte Valley population, 1990 and 2000

Indicator	1990	2000	Change
			Percent
Total population, Butte Valley	1,908	1,885	-1.21
Total population, Siskiyou County	43,531	44,301	1.77
Population by race, Butte Valley			
Caucasian		1,458	
African American		0	
American Indian		112	
Asian and Pacific Islander		8	
Others		246	
2+ races		61	
Percentage of population that is Hispanic (%)		24.0	
Median age, Butte Valley	33.3	37.2	11.70
Median age, Siskiyou County	37.2	43	15.59

Table 13—Age distribution, Butte Valley population, 1990 and 2000

Age distribution	0–4	5–19	20–29	30–44	45–64	65 and up
1990 Butte Valley	128	524	164	476	338	278
2000 Butte Valley	122	464	196	359	469	275
Change (percent)	-4.69	-11.45	19.51	-24.58	38.76	-1.08
1990 Siskiyou County	2,993	9,746	4,182	10,546	8,867	7,197
2000 Siskiyou County	2,273	9,425	3,591	8,318	12,615	8,079
Change (percent)	-24.06	-3.29	-14.13	-21.13	42.27	12.72

Table 14—Education indicators, Butte Valley, 1990 and 2000

Indicator	1990	2000	Change
			Percent
School enrollment, Butte Valley	466	473	1.39
School enrollment, Siskiyou County	8,680	9,091	4.74
Completed high school, Butte Valley (percent)	61.42	68.83	12.06
Completed high school, Siskiyou County (percent)	77.36	83.78	8.30
BA, graduate, professional degrees Butte Valley (percent)	7.03	7.29	3.70
BA, graduate, professional degrees Siskiyou County (percent)	14.17	17.75	25.26

Table 15—Economic indicators, Butte Valley, 1990 and 2000

Indicator	1990[a]	2000	Change
			Percent
Median household income, Butte Valley	21,594	23,325	8.02
Median household income, Siskiyou County	27,204	29,530	8.55
Unemployed, Butte Valley (percent)	12.99	9.69	-25.40
Unemployed, Siskiyou County (percent)	9.37	9.55	1.92
Poverty, Butte Valley (percent)	26.79	21.86	-18.40
Poverty, Siskiyou County (percent)	13.99	18.56	32.67

[a] Median household income has been adjusted for inflation and is reported in 2000 dollars.

Table 16—Household income distribution, Butte Valley, 1990 and 2000

Household income distribution	<$10,000	$10,001-$14,999	$15,000-$24,999	$25,000-$34,999	$35,000-$49,999	$50,000-$74,999	$75,000-$99,999	$100,000-$149,999	$150,000 and up
1990									
Butte Valley	145	136	196	109	68	35	8	9	0
2000									
Butte Valley	133	66	184	125	116	88	28	11	11
1990 county	3,349	2,361	3,945	2,733	2,472	1,560	414	279	120
2000 county	2,691	1,960	3,577	2,369	3,129	2,711	1,075	683	378

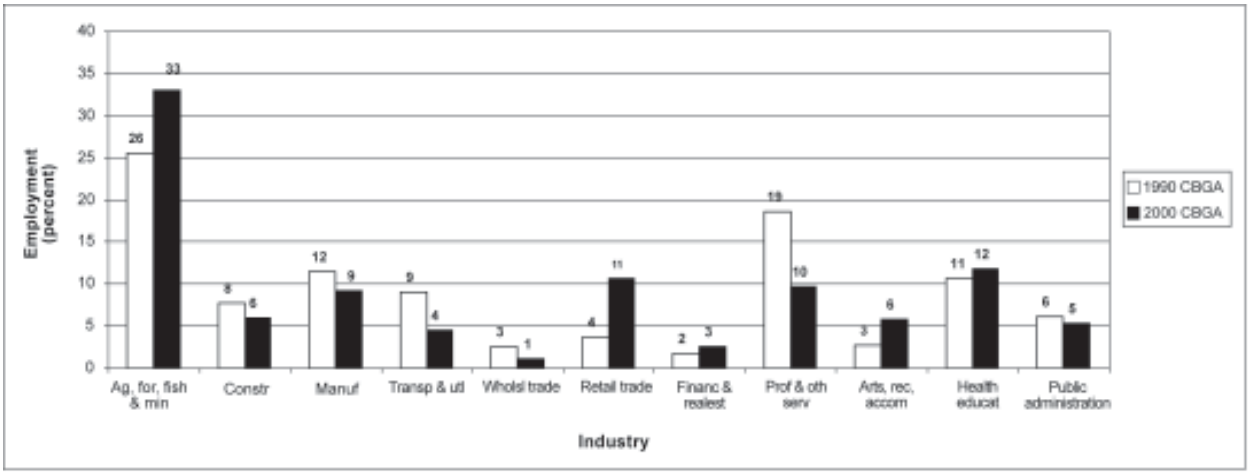
Note: These data are not adjusted for inflation.

sharply) (fig. 34). Agriculture, forestry, fishing, hunting, and mining also grew substantially, with 33 percent of residents employed in this sector in 2000, far more than in any other sector in Butte Valley and well above the county average. The manufacturing, and transportation, warehousing, and utilities sectors (where timber employment is often represented) declined. The socioeconomic well-being score of Butte Valley was low in 1990 at 52.4 and was still low in 2000 at 50.7. These scores were substantially lower than average for the 37 communities within 5 miles of the KNF.

Although the timber industry was an important employment sector in Butte Valley historically, by 1990, Butte Valley had long since lost its sawmill. Forest industry jobs remained an important component of the local economy. However, when logging on federal forest lands was restricted in the early 1990s, the local effects were big. Initially, there was a lot of fear, unrest, and anger. Many truckers, fellers, markers, and people who worked for the Forest Service lost their jobs. Loggers and truckers could no longer find jobs that would sustain their families. Some individuals began "tramp" logging, going farther and farther from home to find work, which caused strain within families. Many people moved away, disrupting close family generational ties, and established ways of life. By 2003, the bigger truck operators were located in cities, and traveled greater distances to work. Two mills remained in Butte Valley. One is a molding mill, in operation since 1924, and an industry leader in the United States. The other went through two previous incarnations as a molding business, and in 1997 became a peeler core business.

Some people stayed in Butte Valley and commuted to work in the mills in Klamath Falls, Oregon. Others stayed and switched to lower paying jobs in the service sector, sometimes commuting to Klamath Falls. Pay reductions caused a reduced standard of living and often required both husband and wife to work to support their household. Some interviewees reported an increase in drug use, crime, and other social problems in the community since 1990 that they associated with job loss in the timber sector. As of 2003, interviewees did not know anybody in Butte Valley still employed in timber-industry-related jobs, except for employees of the two small mills that remained in Dorris, and Forest Service employees at the local ranger district office. Most did not feel that the timber industry had much economic or social influence in the area any longer.

While the timber industry was declining in Butte Valley, the potato industry was thriving. People worked in the fields in summer, and in potato sheds in the winter. Potato farming was a year-round source of employment, so workers bought houses and settled in the community. Since 2000, potato farming in Butte Valley has largely disappeared because of international trade practices, changes in American eating habits, and the expensive cost of pumping ground water to irrigate them. Potato farmers sold out to strawberry farmers, and strawberry



Employment by industry	Agriculture, forestry, fishing, hunting and mining	Construction	Manu-facturing	Transportation, warehousing and utilities	Wholesale trade	Retail trade	Finance, insurance, real estate and rental, leasing	Professional and other services	Arts, recreation, accommodation and food services	Health, education and social services	Public admini-stration
1990	159	48	72	56	16	23	11	116	17	67	38
2000	228	41	64	31	8	74	18	67	40	82	37
Change (percent)	43.40	-14.58	-11.11	-44.64%	-50.00	221.74	63.64	-42.24	135.29	22.39	-2.63

Figure 34—Employment by industry, Butte Valley, 1990 and 2000.

farming has now replaced potato farming. Strawberry plants are grown in Butte Valley, and then shipped elsewhere to be replanted and to produce berries. Work on the strawberry farms is seasonal, and is performed mainly by migrant workers. This shift in farming has reportedly caused job loss in the community's agricultural sector since 2000. Some potato farmers are still in the area, but others have moved.

The timber and potato farming sectors of the community supported local businesses and services, such as mechanics and supply shops selling logging and farming equipment. With both of these groups largely gone from Butte Valley, these businesses and services have suffered. Interviewees did not perceive the strawberry growers as contributing much to the community or the local economy because of their seasonal presence and practice of hiring mostly nonlocal workers. Trends in the Butte Valley farming sector were not viewed as being tied to federal forest management policy.

Ranchers were another important component of Butte Valley's agricultural sector. Those who had Forest Service grazing allotments relied on them heavily, as most did not own enough acreage to keep cattle on their own property year-round. Typical permittees run cattle on their own land for part of the year, on the KNF for part of the year, and on pasture rented from other private landowners for part of the year. Each piece is critical to the viability of the overall operation. In general, ranchers move their cattle to the KNF allotments in late spring or early summer, where they remain until late summer or early fall.

In recent years, the water crisis in the Klamath Basin and the drought in southern California have caused farmers to come to Butte Valley in search of farmland and water for irrigation. These farmers have created competition for land with local ranchers, and caused the cost of renting seasonal pasture to rise. As a result, it has become difficult for Butte Valley ranchers to compete economically for access to winter pasture. When they cannot rent

pasture locally, they must take their cattle farther away to find pasture, increasing the cost of production.

Production costs associated with running cattle on the KNF have reportedly increased since the Northwest Forest Plan was adopted. The Plan was perceived by several interviewees as increasing agency scrutiny over grazing practices. Some interviewees said that ranchers had to monitor their animals more closely on the allotments to be sure that they did not overgraze. They also had to do more mitigation work to comply with the Aquatic Conservation Strategy, such as maintaining more fences to keep cattle out of riparian areas. These requirements increase labor demands. Greater scrutiny over grazing and reduced access to water, combined with non-Plan-related factors such as drought, meant that allotment days and animal unit months on the KNF had gradually declined. This decline increased ranchers' needs for access to private pasture, which was becoming increasingly scarce and expensive. Despite these pressures, ranchers interviewed in Butte Valley felt that their Forest Service allotments were secure relative to the private land component of their grazing strategy.

In short, ranchers in Butte Valley felt squeezed by unstable beef prices, which made it difficult for them to keep up with rising production costs. Each year was a challenge, making it hard to pass on the family business. According to interviewees, the only ranching families that were likely to persist were those who had enough pasture and water on land they owned to support their herds year-round.

One segment of the Butte Valley population that had reportedly increased since 1990 consisted of people on fixed or low incomes, including retirees. The cost of living, presence of services in Dorris, proximity to Oregon where shopping is more affordable because of no sales tax, recreation opportunities, beautiful scenery, other natural amenities, and lack of traffic make Butte Valley attractive. Some retirees spent the summer in Butte Valley and went to warmer places in the winter.

Another segment of the local population commuted to jobs in Oregon, mainly in Klamath Falls. These people may have chosen to live in California instead of moving to Oregon because property taxes are lower in California, and housing is inexpensive in Butte Valley. Butte Valley also offers a rural setting and a small-town atmosphere that people like. The rise in the number of community residents employed in the service and retail trade sectors between 1990 and 2000 may be explained by this commuting pattern.

Adaptation to Change and the Forest Service Role in Mitigating Plan Effects

Like Scott Valley, Butte Valley has historically had a diverse natural-resource-based economy, with timber, ranching, and farming all playing important roles. Although the timber sector has all but disappeared, ranching continues, and farming—although changing—persists. Highway 97, which branches off of Interstate 5 and serves as the major transportation corridor going north through central Oregon up the east side of the Cascades, runs through Butte Valley and is used by truckers. The highway takes two turns through the town of Dorris, causing people to slow down and stop, eat, and shop on their way through town. Highway 97 brings traffic that is critical to the business sector in Butte Valley, which could not be sustained by the local population alone. The volume of traffic is reportedly increasing, helping the community survive. The community fought a proposed construction project that would have caused the highway to bypass the town of Dorris because of the potential loss of business.

The Dorris city council has worked to attract business to Butte Valley by improving the city's infrastructure (e.g., water and sewer, fire department), cleaning up the town, and renovating old, rundown houses with support from grants and loans. The community's proximity to Klamath Falls limits opportunities for development, however (Doak and Kusel 1997: 48). There was also a shortage of people willing to engage in local civic groups and city government and in helping the community improve local conditions and adapt to change. The loss of timber workers, Forest Service employees, and farming families

in Butte Valley caused a drop in human capital, and the core nucleus of individuals who remained and played this role was small and susceptible to burn-out. Doak and Kusel's (1997) social assessment of the Klamath region gave Butte Valley the lowest possible community capacity score, and the second lowest socioeconomic status score, giving this community one of the lowest socioeconomic well-being rankings in the Klamath region.

Local residents interviewed viewed Butte Valley as potentially attracting tourists. In 2003, the section of Highway 97 that goes through Butte Valley was included as part of the Volcanic Legacy Scenic Byway. Bird-related tourism is being promoted in the area. The city of Dorris recently built the tallest flagpole west of the Mississippi River. In the last 2 years, Dorris has also sponsored a 4th of July celebration, and an "Art in the Park" event. All of these activities were designed to attract tourists, who the community hopes will contribute to the local economy. Residents were divided over recreation and tourism development, and acknowledged that they were unlikely to be a solution to the area's economic problems. Butte Valley is more a pass-through area than a destination because it lacks tourist attractions and infrastructure.

The two mills in Dorris that have been there for decades, (a molding mill and a peeler core mill) have persisted as a result of the managers going to trade shows and developing markets outside of the local area. The mills have shifted their supply of raw materials from expensive, locally produced wood to cheap, imported wood from New Zealand and peeler cores from Oregon mills. They do not use federal timber. They are also able to respond to orders quickly. By adapting to changing market conditions and the needs of their clients, these mills have survived.

According to interviewees, the Forest Service has not played a major role in helping the community adapt to change. Contracting work on the KNF has not been significant. Once timber workers moved away, few local people remained who had the skills and equipment needed to do contract work. More recently, a few seasonal contracting jobs have become available through the National Fire Plan to reduce hazardous fuels. The community recognized the KNF as a tourist attraction and wanted to see the Forest Service develop interpretive programs to help attract more visitors. Community interviewees viewed the forest's efforts to develop east-side snowmobiling opportunities in a positive light. This development has brought more recreationists to the area. The KNF also worked with the community to promote a Volcanic Byway designation, and the Forest Service in Oregon helped develop a brochure on local birding opportunities. Federal grant money to support economic and community development in Butte Valley, and small business loans–some of which came through the NEAI–have been critical for helping local businesses survive.

Otherwise, no new forms of resource-related work on the KNF emerged to contribute in a meaningful way to the local economy of Butte Valley. Mining was never important there. Matsutake (*Tricholoma magnivelare*) mushroom harvesting became more popular over the last decade. Local businesses profited when the KNF produced good matsutake crops, because most mushroom pickers were nonlocal and bought food and gas in the community when they were picking mushrooms. Matsutakes also provided a supplemental source of income to a few local residents who pick them. However, interviewees did not think mushrooms had the potential to significantly benefit the local economy because they are seasonal, erratic, and subject to price fixing by buyers.

Changing Relations Between Butte Valley and the Klamath National Forest

Today, few people in the Butte Valley are connected to the KNF through their employment. Timber workers have moved away (despite the fact that most timber harvest on the KNF now occurs on the east side). The main segment of the local population that interacts with the KNF are the grazing permittees. The permitees interviewed reported good relations with the agency. Otherwise, Butte Valley residents interviewed felt largely disconnected from the Forest Service, and took little interest in forest management issues. Farming was the biggest employment sector

in Butte Valley, and farming issues were viewed independently of forest management issues. There had been little connection between forest management and community development opportunities.

Forest Service employees were valued as members of the Butte Valley community. Interviewees viewed strengthening the ties between Forest Service employees and the community as being key to building stronger relations between the KNF and the community. They wanted to see Forest Service employees get more involved with local groups, activities, and government. Forest-community relations were viewed largely as contingent on the specific individuals who held Forest Service jobs and their disposition toward getting involved with the community. The Shasta tribal members interviewed reported good relations with the Forest Service.

The KNF is physically more distant from Butte Valley than from the other two case-study communities. This distance may partly explain why forest management issues are not at the forefront in Butte Valley, and why relations between the community and the KNF are weak. Although the Butte Valley National Grassland lies on the valley floor, interviewees did not mention it. Nor did they comment on the Goosenest Adaptive Management Area, which apparently has not actively engaged Butte Valley residents in collaborative forest stewardship.

Mid-Klamath

The Mid-Klamath community lies in northwestern Siskiyou County and encompasses the area bounded by the Klamath River to the south, the Oregon border to the north, and the towns of Klamath River upstream and Happy Camp downstream (all to the west of Interstate 5) (fig. 35). Although the community is large geographically, the total population is small (1,660 people in 2000) because much of it contains the KNF lands. In addition to the towns of Klamath River and Happy Camp, the community includes the small towns of Horse Creek, Hamburg, and Seiad Valley. These towns lie along the Klamath River and Highway 96, the main transportation corridor through the community. Highway 96 follows the river from Interstate 5 (to the east) southwest to Highway 299 where it ends roughly 25 miles inland from the coast. The Mid-Klamath community is the most remote of the three case communities. The entire area is unincorporated.

Happy Camp is the largest town along the river, containing 38 percent of the Mid-Klamath population. It also contains several stores, a few restaurants, three or four motels, an elementary school and a high school, a health clinic, a small museum focusing on Karuk tribal culture, a library, a Forest Service district office, and the Karuk tribal government offices. The remainder of the population is mainly concentrated around the other small towns that make up the community, each of which have a few hundred residents. These towns are surrounded by the western portion of the KNF. The community between Happy Camp and Hamburg is roughly 95 percent public land managed by the KNF. Between Hamburg and Klamath River, a checkerboard pattern of land ownership prevails, with much of the private property held by private industrial forest landowners such as Fruit Growers Supply Company. Community residents live in the narrow Klamath River valley or along its major tributaries (e.g., Indian Creek, Seiad Creek). They are surrounded by the steep forested slopes of the Siskiyou and Klamath mountain ranges.

The Mid-Klamath community lies within the ancestral territory of the Karuk and Shasta Tribes. The Karuk ancestral territory includes the Klamath River area between Seiad Valley to the east and Bluff Creek to the west, and the Shasta ancestral territory includes the areas east of Seiad Valley (USDA FS 1999: 4-1). The first wave of Caucasian settlers entered the area around 1850 in search of gold (USDA FS 1997: 3-23). Small mining camps sprang up along the mid-Klamath River and its tributaries. Miners searched for gold as well as copper and silver. By the early 1900s, mining had started to diminish, and by 1920 it had declined significantly (USDA FS 1997: 3-66). Today gold mining occurs on a small scale, and much of it is recreational in nature.

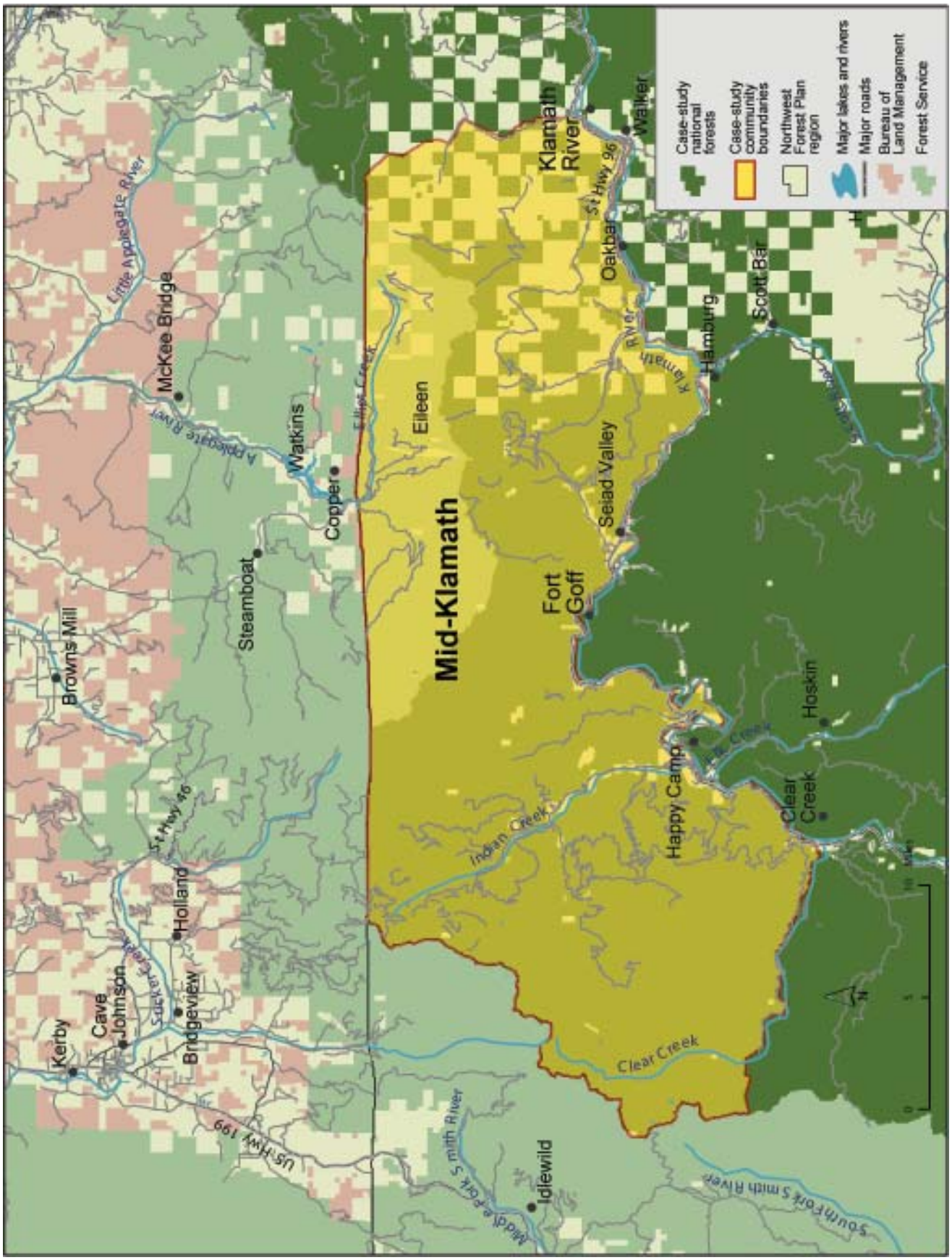


Figure 35—The Mid-Klamath community.

Commercial timber harvesting began in the community around 1950 (USDA FS 1997: 3–66). From the 1950s until 1990, timber dominated the local economy. Much of the community's road system was built during this period (USDA FS 1999: 4–3). Farming and ranching have only been practiced on a small scale by a small number of Mid-Klamath residents owing to a shortage of flat land in the region and the difficulty in clearing it. The exception to this has been in the Beaver Creek watershed above the Klamath River where cattle and sheep grazing occurred on a large scale along the Siskiyou Crest starting in the early 1900s (USDA FS 1996: 4-13—4-14). Since the 1940s, grazing in that drainage has decreased substantially. The Karuk Tribe has no land base in the form of a reservation.

Community Change and the Role of Forest Management Policy

According to U.S. census figures, the number of people living in the Mid-Klamath community dropped from 2,117 to 1,660 between 1990 and 2000–a 22-percent decline (table 17). This trend contrasts with Siskiyou County as a whole and the other two case-study communities, where the total population remained stable over the decade. The decline is associated with a loss in the number of people under age 44 during the decade (table 18). The number of residents ages 0 to 4, and 20 to 29 dropped by over 50 percent, while the number of people ages 5 to 19, and 30 to 44 dropped 40 and 45 percent, respectively. In contrast, the 45-to-64 age group grew by 86 percent between 1990 and 2000. These population changes resulted in a rise in the median age of the Mid-Klamath population from 32.5 years in 1990, to 44.4 years in 2000. As of 2000, the Mid-Klamath population was 73 percent Caucasian, 19 percent American Indian, and 6.5 percent 2+ races (this may include individuals of mixed Caucasian and American Indian descent). The Karuk is the dominant tribe in the area. African Americans and Asians and Pacific Islanders together represented only 1.5 percent of the total population. The Mid-Klamath's Hispanic population was 3.8 percent in 2000.

The decline in the Mid-Klamath community's school-age population mirrored the 41.8-percent decline in school enrollment that occurred between 1990 and 2000 (table 19). Although the percentage of the population that had graduated from high school rose slightly, the percentage holding B.A. degrees or higher dropped by 22 percent. This drop was a marked contrast to the rise that occurred countywide.

Table 17—Mid-Klamath population, 1990 and 2000

Indicator	1990	2000	Change
			Percent
Total population, Mid-Klamath	2,117	1,660	-21.59
Total population, Siskiyou County	43,531	44,301	1.77
Population by race, Mid-Klamath			
Caucasian		1,207	
African American		7	
American Indian		318	
Asian and Pacific Islander		17	
Others		3	
2+ races		108	
Percentage of population that is Hispanic (%)		3.85	
Median age, Mid-Klamath	32.5	44.4	36.62
Median age, Siskiyou County	37.2	43	15.59

Table 18—Age distribution, Mid-Klamath population, 1990 and 2000

Age distribution	0-4	5-19	20-29	30-44	45-64	65 and up
1990 Mid-Klamath	192	577	212	586	287	263
2000 Mid-Klamath	86	340	98	323	534	279
Change (percent)	-55.21	-41.07	-53.77	-44.88	86.06	6.08
1990 Siskiyou County	2,993	9,746	4,182	10,546	8,867	7,197
2000 Siskiyou County	2,273	9,425	3,591	8,318	12,615	8,079
Change (percent)	-24.06	-3.29	-14.13	-21.13	42.27	12.26

Table 19—Education indicators, Mid-Klamath, 1990 and 2000

Indicator	1990	2000	Change
			Percent
School enrollment, Mid-Klamath	586	341	-41.81
School enrollment, Siskiyou County	8,680	9,091	4.74
Completed high school, Mid-Klamath (percent)	73.54	77.56	5.47
Completed high school, Siskiyou County (percent)	77.36	83.78	8.30
BA, graduate, professional degrees, Mid-Klamath (percent)	14.21	11.09	-21.96
BA, graduate, professional degrees Siskiyou County (percent)	14.17	17.75	25.26

Table 20—Economic indicators, Mid-Klamath, 1990 and 2000

Indicator	1990[a]	2000	Change
			Percent
Median household income, Mid-Klamath	31,236	20,924	-33.01
Median household income, Siskiyou County	27,204	29,530	8.55
Unemployed, Mid-Klamath (percent)	16.18	19.60	21.14
Unemployed, Siskiyou County (percent)	9.37	9.55	1.92
Poverty, Mid-Klamath (percent)	14.83	24.42	64.67
Poverty, Siskiyou County (percent)	13.99	18.56	32.67

[a] Median household income has been adjusted for inflation and is reported in 2000 dollars.

The median household income in the Mid-Klamath community also went down between 1990 and 2000, from $31,236 to $20,924–a drop of 33 percent (table 20). Again, this is counter to the trend that occurred in Siskiyou County, where median household income rose by 8.6 percent between 1990 and 2000. Unemployment grew, and the number of households living below the poverty line grew substantially (by 65 percent). Table 21 shows the shift in household income distribution that occurred between 1990 and 2000. The number of people

Table 21—Household income distribution, Mid-Klamath, 1990 and 2000

Household income distribution	<$10,000	$10,001-$14,999	$15,000-$24,999	$25,000-$34,999	$35,000-$49,999	$50,000-$74,999	$75,000-$99,999	$100,000-$149,999	$150,000 and up
1990									
Mid-Klamath	128	121	151	122	131	63	33	25	8
2000									
Mid-Klamath	142	96	145	96	79	97	33	23	4
1990 county	3,349	2,361	3,945	2,733	2,472	1,560	414	279	120
2000 county	2,691	1,960	3,577	2,369	3,129	2,711	1,075	683	378

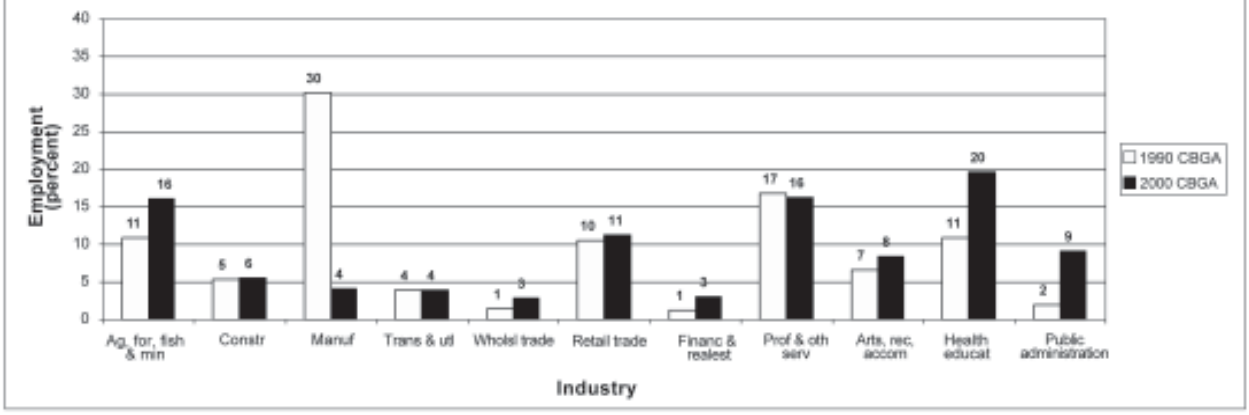
Note: These data are not adjusted for inflation.

earning between $50,000 and $75,000 per year grew, and the number of households earning more than $75,000 per year declined slightly. The number of households earning under $50,000 per year declined in all categories except for those earning less than $10,000 per year, which grew.

Figure 36 shows changes in employment by industry for the Mid-Klamath community. In 1990, the largest employment sector was manufacturing, which accounted for nearly one-third of all employment, making it much more important in the Mid-Klamath area than in Siskiyou County as a whole. This undoubtedly reflects the number of jobs in sawmills that existed in the community in 1990. Other important employment sectors in 1990 were retail trade; services; and agriculture, fisheries, forestry, and mining. By 2000, manufacturing accounted for only 4 percent of all employment in the Mid-Klamath, by far the biggest decline in any of the community's employment sectors. Number of jobs in construction; transportation and utilities; and retail trade also declined. In 2000, services and health and education accounted for 45 percent of all employment. The sector that exhibited the most dramatic growth was public administration, which more than doubled.

In 1990, the Mid-Klamath community had a socioeconomic well-being score of 51.7 (low). By 2000, its score was 42.3 (very low). The Mid-Klamath had one of the lowest socioeconomic well-being scores of all the 37 communities within 5 miles of the KNF. These data indicate that socioeconomic conditions in the Mid-Klamath community deteriorated between 1990 and 2000.

Census data are consistent with the accounts of community change given by Mid-Klamath community members interviewed. According to the interviewees, between the 1960s and the early 1990s, the economy of the community was driven by timber. The local timber economy, in turn, almost wholly depended on federal timber because the community is surrounded by the KNF, and there is little private timberland nearby. During the 1970s and 1980s, interviewees said it was easy to get logging and mill jobs locally. Five mills operated in the area. When the federal timber supply dropped off in the early 1990s, mills closed and jobs became scarce. Not just loggers and mill workers were affected; the KNF, which had been the other major employer in the community, had to downsize because many of its employees supported the KNF timber program. Many mill workers, loggers, and KNF employees moved away in search of work elsewhere, taking their families with them. Timber workers went to places such as Redding, Brookings, and Medford. As a consequence, housing prices dropped, stores and service centers that had supported the workers shut down, and school enrollment declined precipitously. Not only did the community lose its economic base, but it also lost productive people who were hard-working and contributed much to the community. The exodus of timber



Employment by industry	Agriculture, forestry, fishing, hunting and mining	Construction	Manu-facturing	Wholesale trade	Retail trade	Transportation, warehousing, and utilities	Finance, insurnce, real estate and rental, and leasing	Education, health, and social services	Arts, recreation, accomodation, and food services	Public admin-istration	Profes-sional and other services	Total employed
1990 CBGA	75	37	208	10	72	27	9	75	46	14	116	689
2000 CBGA	75	26	19	13	53	18	14	92	39	43	76	467

Figure 36—Employment by industry, Mid-Klamath, 1990 and 2000.

workers from the Mid-Klamath community was accompanied by the loss of a way of life and local culture associated with working in the woods. By the mid-1990s, most of this culture was gone, although some loggers have remained in the area. The drop in population and school enrollment reported by the census reflect this change.

Many Mid-Klamath interviewees believed the listing of the northern spotted owl (*Strix occientalis caurina*) under the Endangered Species Act and the Northwest Forest Plan caused the changes described above. One logger interviewed stated that the Plan made operating difficult for small loggers who remained in the community. Small, independent loggers once made a living by buying small timber sales they could afford. Plan requirements increased the cost of timber sale preparation, so that new sales under the Plan had to be larger to be cost-effective. Small logging operators could not always afford to bid on these large sales, and therefore felt squeezed out of the market.

Community members interviewed said that since the decline of the local timber economy, some new people have moved to the Mid-Klamath community, especially people on fixed incomes. One such group was characterized by interviewees as being low-income people on welfare, who are drawn to the area in part because of the low cost of living there. This group has reportedly placed a strain on the schools and social service sector. Another group of newcomers consists of people in the early phase of retirement, who do not yet require the health and transportation infrastructure that more elderly retirees need, amenities currently lacking in the Mid-Klamath. A small number of "urban escapees," who telecommute or otherwise work remotely from their place of employment, have also settled in the Mid-Klamath. The outmigration of families with children, the inability of young people to remain in the community because jobs are lacking, and the inmigration of retirees and others greatly altered the social and economic structure of the community. The rise in unemployment and poverty, and the drop in median household income between 1990 and 2000, also reflect these changes.

Apart from the impacts of reduced federal timber harvest on the community, the Plan has had a negligible effect on other forest resource uses. Very few local grazing permittees exist. The one permittee interviewed stated that the Plan had had no effect on his practices because his allotment is at high elevation where there are no rivers or creeks, and hence no associated riparian constraints. He reported that forage availability had decreased slightly because of the reduction of silvicultural activity and early seral stage forest under the Plan. Otherwise, his main concern was the absence of law enforcement officers. Many of his cattle had been poached by hunters. He also felt unsafe on his allotment, which is remote.

One small mining operator was interviewed. He stated that the Forest Service didn't usually cover the cost of permitting small mining operations because it was too expensive to do the required survey-and-manage analysis, and wasn't lucrative enough to warrant the effort. In contrast, large operators could afford to wait several years to get a permit, and could fund the analyses themselves. Thus, small mining operators had been excluded from some mining opportunities under the Plan.

Adaptation to Change and the Forest Service Role in Mitigating Plan Effects

Mid-Klamath residents who remained in the community did so out of a commitment to place, and a determination to find alternate means of survival there. Because most of the land in the area is part of the KNF, replacement timber jobs on private, industrial forest lands were hard to find. In some cases, one family member (typically the husband) found work outside the area and returned home on weekends, while the spouse and children remained in the community. This arrangement was stressful and meant the loss of time with family. Other residents diversified and engaged in mixed pursuits, with both spouses working to support the family. Some loggers owning equipment did contract work on the KNF such as road decommissioning. Other natural-resource-based jobs were limited. Unlike in the Scott and Butte Valleys, farming and ranching were not viable in the Mid-Klamath because of the heavily forested, mountainous terrain. The shortage of private lands also limited development opportunities in the community. Some people found it difficult to adapt to change, resulting in drug abuse, domestic violence, and divorce.

The KNF provides recreational opportunities, and some residents hoped that recreation would provide new economic vitality to the community. The Happy Camp Chamber of Commerce believed that the Klamath River and scenic beauty were the Mid-Klamath's biggest assets, and were looking for ways to bring visitors to the community by marketing them. They believed that more people visiting and staying would benefit the local economy. The chamber was working with the Happy Camp Ranger District office to design and build a visitor center that will be housed in the Forest Service office, and to develop visitor materials and resources. They were also working with the KNF to identify mountain bike trails on the forest, and to attract professional bikers to the area, so that one day it might become a destination spot for mountain biking. The American Canoe Association planned to hold its annual national slalom championships in the Mid-Klamath community in 2004, which was expected to draw many visitors, and to help market the area as a canoeing destination. The chamber also started an annual Fourth of July motorcycle event in 2000, which draws many visitors. There are several recreational vehicle (RV) parks, three motels, and a handful of restaurants in the Mid-Klamath community that provide a small infrastructure to support summer visitors.

The Mid-Klamath was once a nationally-renowned steelhead fishing area, evidenced by a road sign at the entrance to Happy Camp that reads "Steelhead Capital of the World." Fishing brought recreationists to the area and created opportunities to work as fishing guides. However, fish populations declined significantly in the late 1980s and early 1990s, fishing seasons were reduced or eliminated, and guiding requirements became much more strict, making this option no longer attractive to most

people. Interviewees reported that fish populations were rebounding in the early 2000s, bringing hope that they may again attract visitors to the area.

Hunting was another popular recreational activity. Deer and elk hunters come to the Mid-Klamath in the fall and contribute in small ways to the local economy. Several interviewees stated that reduced silvicultural activity under the Plan had caused big game habitat on the forest to deteriorate, however, with negative consequences for big game populations. The Pacific Crest Trail runs through the community in the vicinity of Seiad Valley. It brings summer visitors, but they were not viewed as big spenders, although they do usually eat at least one meal in the local cafe.

Two recreational activities predominated in 2003: gold mining and river rafting. In 1986, two local residents started a recreational mining club called The New 49ers. In 2003, the club had over 60 miles of mining claims along the Mid-Klamath River and its tributaries and club membership stood at about 800. Members came to the community between June and September each year to dredge for gold. Most interviewees viewed them as major contributors to the local economy because they stayed in local RV parks, shopped at local stores, and ate at local restaurants. There was some concern, however, about the environmental effects of their mining practices.

River rafting was uncommon on the middle Klamath River in 1990. In 2003, there were reportedly 75 outfitter-guides running rafting trips there between mid-April and October. The small number of campgrounds and trails in the Mid-Klamath community make rafting a good way for recreationists to explore it. Rafters contribute to the local economy by staying in motels, eating at restaurants, and buying supplies locally.

Some community members interviewed were skeptical that recreation would contribute much to economic development and diversification in the community. They cited remoteness, lack of tourism infrastructure, lack of year-round attractions (such as a ski area), and steep terrain–which makes hiking strenuous–as limiting factors on recreation development. During summer months, the community draws visitors, but in winter, recreation opportunities are few. Some felt that the KNF wasn't doing enough to facilitate recreation development. They said a lack of campground maintenance, boating launches, and maintained trails were deterrents, as were road closures. Some interviewees thought the KNF should build recreation cabins to attract visitors.

Several interviewees commented on the role of natural disasters in supporting the local economy. For example, the 1997 flood brought nearly $4 million in emergency funding to the KNF and other agencies, which created local jobs repairing and decommissioning roads (Dillingham 1999: 1). Fire suppression activities added another $3.5 million to the KNF budget in 1999, again contributing jobs and income to the local economy. Many interviewees viewed fire as a growth area from an economic standpoint.

Interviewees consistently said that the Karuk Tribe was the main driving force behind the survival of the Mid-Klamath community following the timber decline. Many of the Karuk Tribe's 3,200 members live in the Mid-Klamath community. The Karuk were federally recognized in 1979 (Tobe et al. 2002: 2). Many tribal members worked in the timber industry as loggers or mill workers in the decades preceding the Plan. The disappearance of timber industry jobs provided an impetus for the Karuk to seek ways of promoting economic development in the community. They have been extremely successful over the last decade at obtaining grant money to fund projects such as a museum, housing development, education program, and natural resources department. The tribe and the KNF were the two biggest employers in the area in 2003. The tribe's annual operating budget stood at roughly $12 million in 2001 (Tobe et al. 2002). The tribe hires both members and nonmembers. It had fewer than 20 employees in the early 1990s, but had over 100 in 2003. The tribe also took over running some local businesses and services in the Mid-Klamath that would not have remained viable otherwise, such as a hardware store and a health clinic. The tribe is the major service provider to the community, particularly in Happy Camp.

Karuk interviewees said that the tribe feels a responsibility to help the community survive, because the Forest Service is not going to provide for the community. The tribe was viewed as the major contributor to community stability and socioeconomic well-being, not the Forest Service. There was concern, however, over the long-term sustainability of the tribal economy, which depends on soft money that may run out one day. Nevertheless, the Mid-Klamath region constitutes the Karuk ancestral territory, and tribal members are committed to finding ways to stay there.

The Mid-Klamath received a substantial amount of Northwest Economic Adjustment Initiative funding in the mid-1990s. A study of how effective that funding was took place in Happy Camp (Tobe et al. 2002). The Karuk secured $1.86 million in NEAI funds, and the community secured additional funds through other mechanisms. Numerous planning activities took place, and a number of projects were initiated, roughly one-third of which were natural-resource-based (e.g., a small hardwood mill, a furniture business). Tobe et al. (2002) found that the NEAI did increase the physical infrastructure and financial capital of the community. It also provided job training and skills development. It did not lead to significant local job creation, however. The KNF did not provide the contract and other job opportunities needed to support newly trained workers. Instead, retrained workers had to move away to find jobs. Moreover, the NEAI did not build leadership capacity in the community to replace what was lost when timber workers moved away.

The NEAI money was invested in businesses that produced value-added wood products. The new businesses that were created could not absorb the displaced timber workers either. These businesses depended on a supply of raw materials from the KNF. The raw materials required to make these new natural resource-based businesses successful were not supplied on a reliable basis. In sum, although there were some short-term benefits, the NEAI did not have positive long-term effects on the local economy (Tobe et al 2002: 18). Interviewees' main criticism of the NEAI was that it provided one-time funding for projects, but these projects were not linked together to create long-term, sustainable jobs for local residents. And the funding ran out too quickly to be effective.

Changing Relations Between the Mid-Klamath Community and the Klamath National Forest

Because the Mid-Klamath community is surrounded by the KNF, residents feel very connected to the forest and care about it deeply. It is a part of their everyday lives. Many interviewees were frustrated that the KNF had not, in their view, taken responsibility for forest stewardship. They were also frustrated that the KNF provided few local jobs.

Interviewees said community-forest relations hinged largely on the individual district ranger. District rangers who worked well with the community, played an active role in outreach, and exhibited interest in creating opportunities for and benefits to the community from the forest were well-received, and greatly enhanced agency-community relations. In contrast, district rangers who showed little interest in or support for the community were intensely disliked, and caused community-agency ties to sever.

Despite its shortcomings, the NEAI helped to enhance community-forest relations, and bring the community together (Tobe et al. 2002: 15-16). It increased collaboration between the Native and non-Native members of the community. It also helped improve relations between the Forest Service and community residents, which plummeted when timber stopped flowing from the KNF. The Forest Service Rural Community Assistance program allowed the agency to work directly with community members to develop action plans and programs to increase community capacity, which built trust (Tobe et al. 2002: 16). Unfortunately, some of these gains were undermined by the inability of the KNF to provide a predictable supply of wood products to support new businesses started with NEAI funds.

Summary of Northwest Forest Plan Effects

Monitoring question–Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management?

Social and economic change in communities are inevitable. Table 22 shows how the Scott Valley, Butte Valley, and Mid-Klamath communities changed in character before and after the Northwest Forest Plan was adopted. Federal forest management policy is just one of many variables that can shape the nature of that change, however. The Endangered Species Act listing of the northern spotted owl in 1990 and court injunctions halting the flow of federal timber were the turning points that reduced federal timber production, not the Plan. The Plan, which was intended to restore the production of timber from federal forest land, came later, formally codifying a shift in forest management that had already happened.

The role of these events in contributing to change in the three case communities differed. Not all communities were affected the same way, or to the same extent, and Plan effects were more noticeable in some communities than in others. The 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 KNF jobs. The Mid-Klamath community 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. The community was hit hard by the reduction in federal timber supplies. But the Plan was not the only variable causing the timber economy to change. The timber sector in Scott Valley and Butte Valley had been declining since the early 1980s from economic recession, domestic and international competition, changes in market demand for wood products, industry restructuring, mechanization and technological advances, and environmental regulations. The Plan added to these pressures. The Mid-Klamath seemed to be relatively buffered from the changes affecting the industry during the 1980s. Interviewees there perceived the halt of federal timber production around 1990 as being the beginning of the end.

Timber workers and Klamath National Forest employees were among the community members most affected by declines in federal timber harvesting. Many of these people moved out of their communities in the 1990s, causing a loss of working-class families, young people, human capital, and community capacity. We were unable to monitor what became of them. The communities persist, but changes in forest management policy had dramatic and disruptive effects on the lives of many people. The Mid-Klamath community lost 21.6 percent of its population between 1990 and 2000, whereas the population of Scott Valley and Butte Valley showed little

Table 22—Changes in community social and economic orientation, pre- and post-Plan

Community	1970s–1980s	2003
Scott Valley	Agriculture (beef cattle, hay), timber	Agriculture (beef cattle, hay), retirement, bedroom community, mobile workers, services
Butte Valley	Agriculture (beef cattle, potatoes, hay), timber, transportation corridor	Agriculture (beef cattle, strawberries, hay), transportation corridor
Mid-Klamath	Timber, tribal (no land base)	Tribal (no land base), public administration, goods and services Secondary: recreation/tourism, retirement

change, consistent with trends for Siskiyou County as a whole. In contrast, the population grew by 20.6 percent in the nonmetropolitan communities of the Plan area as a whole during this period. All three communities experienced change in population composition.

The special forest products industry, which has grown in the Pacific Northwest since 1990, did not provide an alternative source of family-wage jobs for displaced timber workers or agency employees. Agriculture–which persists in Scott Valley and Butte Valley–has been changing; ranching in particular was under stress as a viable livelihood strategy. Like special forest products, agriculture did not appear to offer a new source of jobs for displaced workers. It contributed to community economic diversity, however, and may help explain why these two communities were not hit as hard as the Mid-Klamath by reductions in federal timber harvesting.

Scott Valley and Butte Valley sustained themselves by having a substantial agricultural sector and being relatively close to regional centers that provided commuting options (Yreka and Klamath Falls). Scott Valley also experienced an influx of retirees, mobile or self-employed workers, and second-home owners. Butte Valley took advantage of its location on a major transportation corridor by capturing associated business opportunities. The Karuk Tribe played an important role in contributing to community development in the Mid-Klamath through the growth of tribal businesses, administration, and social and environmental services.

Of the 12 U.S. census social and economic indicators we tracked, only 2 showed consistent trends across all three communities—median age and percentage of the population that completed high school—both of which increased. Median age rose by 11.7 (Butte Valley), 33.6 (Scott Valley), and 36.6 (Mid-Klamath) percent. Median age for all nonmetropolitan communities in the Plan region rose 10 percent, from 36.4 to 40 between 1990 and 2000 (compared to 15 percent for Siskiyou County and 7 percent for the Nation as a whole). Although this trend in part reflects the aging of the baby boomers, interviewees consistently reported that over time, families and young people had left their communities because of the shortage of jobs. Meanwhile, retirees had moved in, partly because of the low cost of living. The influx of retirees may be partly responsible for the increase in the percentage of the population over 25 that completed high school in each community. In the Mid-Klamath, the percentage of people with a B.A. degree or higher dropped, but elsewhere it rose. Some interviewees also attributed rising educational attainment to the fact that young people could no longer leave high school before finishing and earn good wages in the timber industry. It had become more important to complete high school and obtain a higher degree in order to find family-wage jobs. Economic indicators showed mixed trends. In Scott Valley and Butte Valley, median household incomes rose and the percentage of households living below the poverty line decreased between 1990 and 2000. Percentage of unemployment also decreased in Butte Valley. Percentage of unemployment rose, however, in Scott Valley. The Mid-Klamath community experienced a sharp decrease in median household income and large growth in unemployment and poverty. Not surprisingly, its socioeconomic well-being score dropped from low to very low. The socioeconomic well-being score for Butte Valley showed little change between the two periods, remaining low, while the Scott Valley score sank from medium to low.

We did not evaluate to what extent recreation was sustaining the case-study communities. Interview results showed that recreation, tourism, and natural amenity values played a role in drawing visitors and new residents there. 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. Yet many interviewees stated that tourism and recreation do not provide many family-wage jobs. And their potential for development is constrained by the seasonal availability of recreation opportunities, the supply of forest-based

recreation opportunities, the limited availability of recreation and tourism infrastructure, and the remoteness of Siskiyou County. Nevertheless, the KNF was actively working with local communities to assist with developing recreation and tourism.

Interviewees from Butte Valley viewed the KNF as not having played much of a role in helping the community adapt to change. Although a few small contracting opportunities, some recreation developments, and some economic assistance occurred, no new forms of resource-related work on the forest emerged to contribute meaningfully to the local economy of Butte Valley. The same was true in Scott Valley, although interviewees there viewed the KNF as having made some small contributions through contracting opportunities and NEAI funds. The consensus among Mid-Klamath interviewees was that the KNF had done little to help the community recover from the loss of timber-related benefits. Many interviewees recognized the importance of payments to county governments, however, stating that their communities depended on those funds for supporting schools and other services.

Chapter 4: Communities and Forest Management

Chapter 4 addresses two of the socioeconomic goals of the Northwest Forest Plan (the Plan): (1) to promote collaboration between agencies and communities in forest management, and (2) to protect the forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems. This chapter is based on interviews with both forest employees and community members.

Collaboration and Joint Forest Stewardship

One goal of the Plan was to improve collaboration between federal land management agencies and citizens in forest management (Danks and Haynes 2001: 54). Enhanced collaboration in forest management was expected to improve relations between agencies and the public and to reduce conflict over forest management. This section examines how collaborative relations between the Klamath National Forest (KNF) and the three case-study communities have evolved since the Plan was implemented.

Monitoring question–Did agency and citizen collaboration in forest stewardship improve under the Plan, and did relations between local communities and the Klamath National Forest improve?

The Plan created two formal institutions to promote agency-citizen collaboration in forest management: provincial advisory committees (PACs) and adaptive management areas (AMAs). Provincial advisory committees are chartered under the Federal Advisory Committee Act and consist of up to 29 participants, including representatives of federal, state, county, and tribal governments; the timber industry; environmental groups; recreation and tourism groups; and up to 5 members at large. Some KNF line officers participate in the Klamath PAC, which includes representatives of these different interest groups and provides an interface with the public. We did not systematically evaluate how effective the Klamath PAC has been. However, interviewees who commented on the Klamath PAC stated that initially, the PAC was important in providing a way for KNF line officers to interact and communicate with members of the public having diverse interests about forest management issues. The PAC was also an effective multiparty monitoring group that assessed how well projects on the KNF met Northwest Forest Plan standards and guidelines. More recently, nonagency PAC members had been losing interest because they didn't feel that they were accomplishing anything, didn't have decisionmaking authority, and have had little influence on forest management practices. In addition, the KNF was generally in compliance with Plan standards and guidelines, making the monitoring role less compelling.

Adaptive management areas were designated as places where agencies and other organizations, committees, and citizens would collaborate to innovate and experiment with forest management approaches that would achieve the conservation objectives of the Plan while integrating social and economic objectives. The Goosenest AMA is located on the east side of the KNF. The management emphasis of the Goosenest AMA was development of ecosystem management approaches for pine forests, including objectives related to forest health, production, and maintenance of late-successional forest and riparian habitat, and commercial timber production (USDA and USDI 1994: D-14). According to some interviewees, many proposed projects did not work out, or represented little change from the previous way of doing business.

These comments suggest that the PAC and AMA did not live up to expectations as collaborative institutions, although we did not comprehensively or systematically investigate this topic. In contrast, interviewees said that the Rural Community Assistance Program administered by the KNF with Northwest Economic Adjustment Initiative (NEAI) funding did lead to positive collaborative relationships in the area of economic assistance. Nevertheless, other efforts at forest-community collaboration in joint forest stewardship were informed by experiences

gained through participation in the PAC and the AMA. For example, the Siskiyou County Resource Advisory Committee (RAC) established under the Secure Rural Schools and Community Self-Determination Act, and local fire safe councils (FSC) established under the National Fire Plan (present in the Mid-Klamath and Scott Valley communities) were having some successes. Unlike the PACs, these groups obtain money and make decisions about how to spend it on forest stewardship projects that occur on public (RAC) and private (RAC, FSC) forest lands, with benefits to the KNF. Examples of projects supported by these groups include fuels reduction activities and removal of invasive plant species. Several interviewees felt that the RAC was an evolved form of the PAC. There were many positive comments about both RACs and FSCs. The only criticism was that fire safe councils were funded to reduce fuels on private lands only, which didn't do much good if the Forest Service failed to reduce fuels on adjacent lands.

Shortly after the Plan was adopted, a forest roundtable group formed in Siskiyou County that had several participants from Scott Valley. The purpose of the roundtable was to provide a forum for collaboration between community members representing diverse stakeholder groups and the KNF in implementing the Plan successfully. A primary activity was to give the forest feedback on the social acceptability of its timber sale proposals, so that timber sales could move forward with public support. Some Scott Valley interviewees said that the forest roundtable was highly effective during the first few years of its existence. Members invested a great deal of skill, hard work, and commitment in the effort. This initial success did not last, however, because a few roundtable members who disagreed with some timber sales disengaged from the collaborative, consensus-building process and instead, issued appeals and litigation against those they disagreed with. Contributing to the problem was a climate of distrust created by the Congressional Salvage Rider of 1995. For 18 months, the Salvage Rider exempted salvage timber sales on national forests from the administrative appeals process, limited the time available for judicial review, and eased environmental planning requirements associated with salvage sales in an attempt to quickly harvest timber following fires. The Salvage Rider also ordered the release of several green timber sales, many of which were in old-growth forests, that had been halted by environmental concerns. The Salvage Rider came shortly after the Plan went into effect, and over-rode agreements that were embodied by the Plan, causing many people in the environmental community to feel betrayed. The forest roundtable disbanded when members felt that there was no longer any point in collaborating to reach local consensus on forest management issues, because their efforts were repeatedly undermined by dissenting individuals who brought appeals and litigation. The failure of this attempt to collaborate in Plan implementation discouraged subsequent groups from forming to collaborate in addressing ongoing issues relating to KNF management. Nevertheless, the experience gained from the forest roundtable helped local collaborative groups come together around other issues of concern, such as water and fisheries management in the Klamath basin.

There have been other disincentives to collaboration as well. Several community residents expressed the view that decisionmaking on the KNF had shifted from the local forest to the regional and national levels under the Plan, making local collaboration on forest management issues pointless. They also said the Plan and other regulatory constraints left local managers with little ability to conduct management activities, again making collaboration to affect forest management policy pointless. Some Mid-Klamath residents said it was hard to collaborate when there is high turnover in forest staff, making it difficult to build long-term relationships. Karuk tribal members interviewed attributed this turnover to the frustration experienced by Forest Service employees who were unable to accomplish anything because of Plan constraints. Some Scott Valley residents expressed the view that collaborating with the Forest Service would not help them meet their changing needs, nor would it contribute

to community well-being. Thus, they lacked incentive to get involved. Moreover, they were doubtful they would have any influence over forest management policy.

The Plan also called for more collaboration between the KNF and other federal and state regulatory agencies. Consequently, KNF employees in upper levels of management spent a great deal of time, effort, and money working with other agencies on issues relating to resource protection, which decreased their ability to interact collaboratively with local communities. The reduction in the number of KNF employees also meant that fewer people were available to interact with community members.

From the agency perspective, an important motivation for engaging in collaborative projects is to leverage resources from external groups, such as money and labor. The drop in KNF budgets and staffing created a need to develop partnerships with other groups in order to get work done on the ground. For example, collaborative projects with the Rocky Mountain Elk Foundation, Ducks Unlimited, and the California Department of Fish and Game improved wildlife habitat on the KNF. Many partnerships have focused on watershed restoration. Collaborative projects are often accomplished through Forest Service partnership agreements. These investments help the KNF leverage resources, make community members more aware of forest management issues, and involve local residents in forest stewardship. They also provide local jobs, and help local groups build their capacity.

Table 23 shows the amount of money the KNF and its partners spent on grants and agreements in 2002 and 2003. Unfortunately, comparable data from earlier years do not exist in corporate databases, so it was not possible to identify trends in grants and agreements funding. In 2002, the KNF spent roughly the same amount on grants and agreements as it did on procurement contracting for ecosystem management work. However, the KNF contribution to the total cost of the projects supported by grants and agreements was less than 50 percent; partners provided the balance of funds by contributing to projects that had ecosystem management benefits to the forest. In 2003, funding for grants and agreements was nearly three times what it was in 2002, with the KNF contributing 58 percent of the total project costs. These data indicate that the forest was able to leverage substantial resources through partnership agreements, and illustrate the rationale for investing in them as an alternative to procurement contracting. Another advantage of grants and partnership agreements is that once money is transferred to a partner, that partner can hire people to do the work without facing the hiring restrictions associated with procurement contracts. This makes it easier to create jobs for local residents.

Table 23—Grants and agreements funding, 2002 and 2003

Funding year	Klamath National Forest	Non-federal partners	Other federal partners	State partners	Total project funds
	Dollars (%)	– – – – – – – – *Number (%)* – – – – – – – –			*Dollars*
2002	1,095,461 (43)	451,402 (18)	37,013 (1)	983,531 (38)	2,567,406
2003	3,671,471 (58)	493,955 (8)	239,824 (4)	1,884,945 (30)	6,290,195

Notes: Includes cash, noncash, nonfund, in-kind, plus program income subtotals. Nonfederal partners include nonprofit organizations.
Source: Forest Service INFRA database.

The success of partnerships depends on the presence of partners that have the resources and the capacity to work effectively with the Forest Service, such as local community groups, nonprofit organizations, and tribes. The Mid-Klamath community had two main partners working with the KNF in 2003: the Karuk Tribe and the Mid-Klamath Watershed Council. In 2003, Karuk tribal officials reported that the tribe had established a working relationship with the KNF under the Plan, and had attempted to implement a number of collaborative projects with the forest. The limitations imposed by the Plan's survey-and-manage procedures had derailed some of these. In addition, the Karuk perceived other roadblocks, including a lack of coordination between the Plan and the NEAI, a lack of collaborative support among some individuals employed by the KNF, and a lack of agency support for the Plan itself. Despite the notable contributions of some KNF employees, the situation led to disillusionment among tribal members regarding the willingness of the KNF to collaborate with them. In 2003, the Karuk leadership remained interested in actively engaging the KNF in collaborative management, but they felt they had been excluded both from providing input and from exercising their traditional ecological knowledge.

One exception was cultural burns. The production of basketry materials, particularly beargrass (*Xerophyllum tenax* (Pursh) Nutt.) and hazel (*Corylus cornuta* Marsh.), depends on regular burning (at roughly 3- to 5-year intervals). Burning makes hazel more pliable, and stimulates the growth of beargrass. In the early 1990s, the Karuk began collaborating with the KNF to undertake controlled burns of the forest understory in areas that are productive for basketry materials. Tribal members worked with KNF employees to identify areas they wanted burned, and when weather conditions were right, KNF and tribal fire crews conducted the burns together. These burns were generally a few acres in size. Tribal members interviewed recognized that the KNF had tried hard to work with the tribe in conducting cultural burns.

In 2001, the Mid-Klamath Watershed Council formed in the town of Orleans, downriver from the Mid-Klamath community. The council works along the middle Klamath River between Orleans and Seiad Valley to support ecological restoration and improve water quality. It had collaborated with the Karuk and with the KNF in restoration activities, such as inventorying and manually pulling noxious weeds on river bars, riparian planting, and clearing fish passageways of rocks. Much of this work was carried out by volunteers.

We encountered no groups in Butte Valley that were collaborating with the KNF in joint forest stewardship activities. Scott Valley residents were more active. There, the Salmon River Restoration Council (SRRC) and the Northern California Resource Center were working with the KNF through grants and partnership agreements. The SRRC aims to restore ecosystem health in the Salmon River watershed (a tributary of the Klamath River), and to promote economic sustainability in the community. It sponsors environmental education, restoration programs, and fish and water quality monitoring. The council obtained grant money from the KNF to conduct projects, including noxious weed removal (especially spotted knapweed (*Centaurea stoebe* L.), road assessments, water temperature monitoring, and collecting native seeds. It also worked with the KNF to develop a restoration strategy for the Salmon River. The SRRC volunteers had also worked with the Happy Camp Ranger District fish biologist to conduct fish surveys, because the district did not have enough employees to do the surveys. The Northern California Resource Center obtained grants to do worker training related to survey-and-manage analysis.

The KNF also accomplishes work through its volunteer program. Volunteers help with activities like trail maintenance and fence building. The KNF recruits volunteers through national programs such as Americorps and the Student Conservation Association, and state programs such as the California Conservation Corps and the Department of Corrections. The data on volunteerism available from corporate databases began with the year

2000. Table 24 shows that the amount of time volunteers spent working on the KNF, and the value of their work, declined between 2000 and 2003. Nevertheless, the number of volunteers participating in the program rose overall. Apparently, more people have been volunteering for shorter periods of time. Forest interviewees said the volunteer program had remained stable since the Plan was adopted. Running volunteer programs took a major commitment of employee time, however, which had become more scarce as the number of KNF employees declined.

Interviewees reported that few case-study community residents volunteered on the KNF. Some Mid-Klamath interviewees said that many people in their community were struggling economically, and were not in a position to work on the KNF for free. They believed that most of the volunteers on the KNF were from outside the region, because people who are well-off economically can afford to volunteer; poor people cannot. One person said that local residents believe the KNF and the federal government should be a source of economic support for them, not vice versa. Others said few local organized groups

Table 24—Senior, youth, and volunteer programs, calendar years 2000–2003

	Senior community service employment program	Hosted[a]	International volunteers	Volunteers	Youth Conservation Corps	Total
Klamath NF person years[b]						
2000	11.66	16.92		6.21	1.56	36.35
2001	6.95	15.23	0.52	7.72	3.14	33.56
2002	4.68	8.62		6.09	No data	19.39
2003		11.92		4.38	1.61	17.91
Value of work performed by enrollees (dollars)						
2000	251,744	287,396		120,258	38,081	697,479
2001	188,168	295,567	9,554	179,107	74,618	747,014
2002	153,524	156,796		149,942	30,867	491,129
2003		151,875		106,249	45,622	303,746
Number of enrollees						
2000	26	125		128	5	284
2001	20	97	2	55	19	193
2002	18	84		141	5	248
2003		94		237	12	343

[a] Hosted programs include Student Conservation Association, Northwest Youth Corps, California Department of Corrections, California Conservation Corps, and Greater Avenues for Independence.

[b] 260 days = 1 year full-time equivalent.

Source: Senior, Youth, Volunteer database.

existed (e.g., Boy Scouts and Girl Scouts) to serve as a source of volunteers. In Butte Valley, there are Boy Scouts and a Lions Club, but they did not volunteer on the KNF in 2003. The lack of volunteerism by Butte Valley residents may be related to their feeling of disconnection from the KNF. The SRRC and the Mid-Klamath Watershed Council have been successful in mobilizing volunteers from Orleans, Somes Bar, and Scott Valley to remove invasive plants and monitor fish species in local watersheds within the KNF. Perhaps organized groups having a commitment to environmental goals are needed to mobilize volunteers to participate actively in joint forest stewardship. All three case-study communities had a limited number of people who actively participated in civic activities. These people often felt stretched already by their work to improve community well-being, and were not likely to add to their existing commitments.

Interviews found that district rangers played a key role in the collaborative process. Many interviewees stated that rangers who were enthusiastic about working with communities were a driving force behind collaboration for joint forest stewardship and community development. In contrast, rangers who had little interest in working with local communities alienated residents and made them lose interest in collaborating with the KNF. The personal disposition of individual district rangers appears to be a key factor behind successful collaboration.

Protecting Forest Values and Environmental Qualities

The Northwest Forest Plan codified a shift in forest management away from the intensive timber management practices of the 1970s and 1980s toward ecosystem management. In doing so, it aimed to balance the need for forest protection with the need to provide for the sustainable use of timber and nontimber forest resources. Hence, one of the Plan's socioeconomic goals 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 [*Strix occidentalis caurina*] and marbled murrelets [*Brachyramphus marmoratus*]), and aquatic and riparian ecosystems. Here we address the topic of forest protection from the social perspective.

Monitoring question—How well has federal forest management under the Northwest Forest Plan provided for forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems?

Community interviewees expressed widespread agreement that pre-Plan timber harvest practices on the KNF were unsustainable and environmentally destructive. No interviewees advocated a return to past harvest practices. Virtually all interviewees cared deeply about the KNF and cited it as one of the main reasons they live where they do. They valued the recreation opportunities, forest products, and scenic beauty it provides. These sentiments were particularly strong in the Mid-Klamath community, which is surrounded by the KNF. All interviewees supported forest protection to preserve ecological integrity, and expected the Forest Service to maintain good forest stewardship practices.

Forest and community interviewees had both good and bad things to say about the effects of the Plan on environmental quality. On the positive side, many interviewees viewed the Aquatic Conservation Strategy as being effective. They thought water quality had not deteriorated and may have improved, as had aquatic ecosystem health and fish populations. People recognized

however that fish populations are affected by many variables. Many interviewees also said that the reduction in clearcutting and timber harvesting on the KNF's steep slopes had been good for watershed health. Environmental group representatives interviewed expressed concern, however, about the amended wording to the Aquatic Conservation Strategy that the agencies adopted in 2004.

Prior to the Plan, watershed and fisheries projects on the KNF focused on instream mitigation for water quality problems. The Plan focused attention on the causes of water quality deterioration (e.g., sediment loading), and targeted key watersheds for restoration work. The Plan requirement that a watershed analysis be conducted prior to any project activity helped the KNF with large-scale planning and identification of project priorities, which facilitated the restoration process. Major floods occurred on the KNF in the 1990s, resulting in large sums of emergency money that made it possible for the forest to fund watershed restoration work. The Riparian Reserve system established by the Plan also helped protect water quality by stipulating that any harvest of streamside trees must benefit the ecosystem, including fisheries. The Plan's emphasis on watershed management and restoration was supported by a larger change taking place within the Forest Service nationwide. Watershed restoration had become an agency priority, as had transportation management and the need to address problems associated with the Forest Service road system.

On the negative side, one interviewee reported that road improvement projects in riparian areas could not take place if they had short-term negative effects on water quality, even if they produced long-term benefits. He cited clearing areas above road culverts to prevent them from plugging as one example. Another interviewee attributed deteriorating road conditions on the KNF and associated negative impacts on watershed health to a lack of timber sales. Prior to the Plan, road maintenance was funded by timber-sale contracts. Because few timber sales had taken place since the Plan was implemented, there was little money to maintain roads.

Regarding wildlife, some KNF interviewees believed survey-and-manage procedures had led to a much better understanding of species habitats and distribution on the KNF, and of how to manage for survey-and-manage-listed species. However, budget reductions made it difficult to implement habitat improvement projects on the KNF. Some community members interviewed believed that a buildup of brush on the KNF, and lack of silvicultural activity, had created habitat mosaics and early seral-stage forest, conditions that were bad for wildlife species, especially big game.

The Plan's survey-and-manage requirements received the most criticism. Some KNF interviewees said that survey-and-manage requirements made it difficult for employees to respond quickly to management needs brought on unexpectedly. For example, when the 1997 flood occurred, it was difficult for the KNF to quickly implement ground-disturbing management activities, resulting in high levels of ecological damage and costly restoration projects. In addition, the survey-and-manage requirement was viewed by many as an impediment to fuels reduction on the KNF.

Many interviewees were concerned that the KNF was neglecting its forest management and stewardship responsibilities. Most believed that active forest management was needed to promote forest health and ecosystem integrity. Both KNF and community interviewees commented that forest health had deteriorated under the Plan. They believed the small amount of silvicultural activity that had occurred under the Plan, combined with historical fire suppression practices, had removed disturbance processes from the ecosystem, resulting in increased tree mortality. The KNF was reported to be full of dead trees, snags, and blowdowns, which many people felt should be "cleaned up." Old plantations needed thinning, and slash from old timber sales needed to be removed. The fuels buildup and lack of management activity in late-successional reserves were viewed as putting spotted owl habitat at risk from fire, counter to the intent of the Plan.

Karuk tribal members interviewed concurred that the KNF was not being well-managed. Burning was an integral part of their traditional forest management strategy. They believed that frequent burns were needed to maintain forest health and desirable forest characteristics, and that 100 years of fire suppression had been very detrimental. They expected the Plan to change this, but it had not.

Community members interviewed frequently said they thought that wood was being wasted. Instead of being logged, trees were left to burn, with no salvage harvest to follow. There was deep frustration among community members that local jobs in the woods could be created to restore and maintain forest health, but this was not happening.

Issues and Concerns Relating to Forest Management

Monitoring question–What issues and concerns related to federal forest management under the Northwest Forest Plan are prevalent in local communities?

Many of the community members interviewed were unfamiliar with the specific components, management guidelines, and requirements of the Northwest Forest Plan, although some were informed about the Plan and its components. Most, however, expressed issues and concerns about the management of the Klamath National Forest, which were, at least in part, linked to Plan implementation. Forest and community interviewees generally agreed on two main issues of concern. The first was the threat of catastrophic wildfire on the KNF, putting communities and private timberlands at risk. The second was the drop in timber production from the KNF, and the associated loss of family-wage, forest-based jobs in local communities. Timber production and associated job loss have been a concern since 1990; fire came to the forefront in the late 1990s.

Fire

On the KNF, low-intensity fires naturally recur every 8 to 12 years, and stand-replacing fires recur every 80 to 180 years (USDA FS 1994a: 3-115). Since the early 1900s, a fire suppression policy has been in place. Many interviewees from Scott Valley viewed the KNF as a bad neighbor and as a liability rather than an asset to the community because of its high and worsening fuel loads. Butte Valley is bigger than Scott Valley, and the KNF is far away from the population center of Dorris. Although fire was a concern among Butte Valley interviewees, it was not as big a concern as it was in Scott Valley. In the Mid-Klamath, interviewees were worried about fuel buildups on the KNF and the lack of local infrastructure with which to fight fires. They also viewed fire as creating local employment opportunities, however. One private industrial forest manager interviewed, whose company owns some 200,000 acres of land interspersed with the KNF, said that fire on Forest Service lands would not be a major concern if salvage logging following a fire were permissible.

Despite the fact that the KNF's budget for hazardous fuel reduction grew during the 1990s, fuels reduction projects were hindered by the Plan survey-and-manage requirements. Mechanical treatments to reduce fuel loads are more expensive than prescribed fire. But prescribed burns cover large areas, and it is expensive to survey those areas to comply with survey-and-manage requirements. The timing of the surveys also causes projects to occasionally stall. If a survey-and-manage species is found in an area to be treated, it becomes difficult to implement the burn because burns are designed to cover an entire area, not to avoid small pockets of species habitat. And, when buffer areas created to protect survey-and-manage species are large, it may be impractical to conduct a burn. As a result, fire project costs had increased to as much as three times what they would be without survey and manage, and may not take place at all.

Karuk tribal members interviewed were concerned that the Forest Service policy of fire suppression over the past century, combined with the KNF's inability to conduct controlled burns because of survey-and-manage requirements, would harm rather than protect survey-and-manage species. They pointed out that species living on the KNF are fire dependent, because they live in a fire-adapted ecosystem. They believe fire is good, not bad, for these species.

Controlled burns in late-successional reserves have been particularly difficult to carry out, because the planning process is extensive, and the decision to move forward must be made by the Northwest Forest Plan Regional Ecosystem Office (rather than the KNF). Northwest Forest Plan standards and guidelines that were developed for fuel treatments in late-successional reserves were viewed by several interviewees as being ecologically inappropriate for fire-adapted ecosystems like the Klamath.

Appeals and litigation by environmental groups had also contributed to the KNF's inability to implement fuels reduction projects. The environmental group representatives interviewed said that so-called fuels reduction and forest health projects proposed by the KNF often included harvesting old-growth trees on steep, erodible slopes instead of small-diameter trees, trees with ladder fuels, plantations needing thinning, and slash removal alone. They believed that timber sales presented under the guise of fuels reduction projects, making them socially acceptable to the public, often targeted old-growth trees growing in critical owl habitat, which they opposed cutting. These interviewees supported the removal of small-diameter trees that were hazardous fuels, but not the harvest of old-growth trees (80 years and older), especially those occurring on steep slopes.

All of these constraints meant that in 2003, the KNF was treating hazardous fuels on one-quarter of the acreage it did when its fuels reduction program was at its peak in the 1990s before survey-and-manage requirements went into effect. Overall, little progress had been made on reducing the risk of stand-replacement fires on the forest; areas that have been treated are minor compared to the number of acres that have burned, many in stand-replacing fires, since the late 1980s (Thomas 2003). In the long term, late-successional forest ecosystems—which the Plan was designed to protect—will likely suffer because of this problem (Spies et al. 2006). The KNF's inability to effectively reduce fuel loads, combined with a prolonged drought, people living in the wildland-urban interface, and low population numbers in Siskiyou County (making it a low priority for fuels reduction money), create a climate of fire risk for local residents.

The timber harvest and fire issues were closely linked in the minds of interviewees. They blamed the lack of vegetation management and timber production under the Northwest Fire Plan for creating excessive fuel loads and associated fire risk. One KNF interviewee noted that a proportion of money generated by timber sales used to go into Knudsen-Vandenberg accounts that were then used to pay for brush disposal work (cleaning up after timber sales), which reduced fuel loads. Several people who fought fires during the fire season did brush disposal and fuels treatment work in the off-season. With the decline of the timber program, this work must be paid for primarily with appropriated money instead of money generated by timber sales and deposited in Knudsen-Vandenberg accounts, meaning it seldom happens. Interviewees also blamed the Plan for limiting the KNF's ability to address fire risk created by historical fire suppression practices.

Forest-Based Jobs

Interviewees from all three communities were concerned about the absence of local, family-wage jobs tied to natural resources. Timber-industry jobs used to provide these, but do not any longer, and are not expected to return in the future. They would like to find new ways in which the KNF could provide local, family-wage jobs that allow them to stay in their communities and maintain family ties. Many community members interviewed said natural disasters–e.g., floods and fires–created local benefits because they brought money and jobs in restoration

and fire suppression, and people (e.g., fire crews) who supported local businesses.

Many interviewees viewed fire management (including fire suppression and fuels reduction) as having the potential to create new opportunities for local, family-wage jobs to replace some of those lost by reductions in federal timber harvesting. They also thought small-diameter trees removed by thinning to reduce fuels could supply wood needed by small local businesses to manufacture value-added products (e.g., furniture, cabinets, coffins), and to initiate new projects such as co-generation plants. The lack of a predictable wood supply made it difficult to invest in wood product businesses in which forest communities may be able to compete.

The opportunity to achieve the Plan goal of linking ecosystem management on the KNF with local, family-wage jobs to contribute to sustainable forest-based communities had not yet been fulfilled in the context of the fire program. Some local jobs had been created on summer fire crews. Many interviewees stated that fire hiring practices were subject to bureaucratic procedures that made it difficult to hire local people even though they are familiar with the landscape and have the knowledge, equipment, and skills to fight and manage fire. In addition, thinning contracts often went to contractors who brought in crews from outside the area rather than hiring locally. Many community members wanted the KNF to provide opportunities to obtain training in the fire sciences and jobs with the KNF fire organization because fire was one area in which budgets were growing. Karuk interviewees were disillusioned that the KNF had not taken advantage of their traditional ecological knowledge relating to fire management. They also wanted the forest to provide a predictable supply of wood that could be used to develop value-added products.

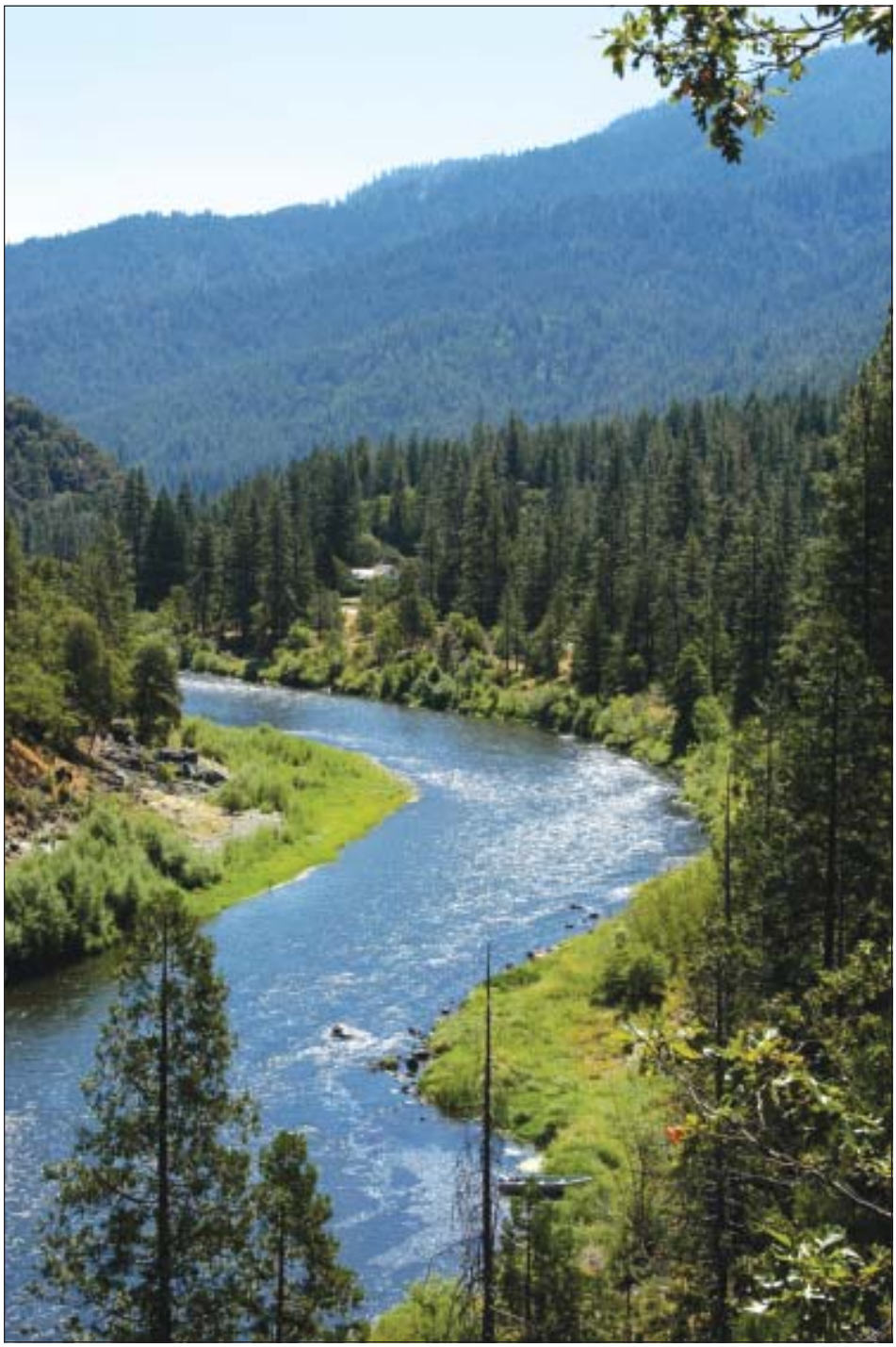
Other Forest Management Issues

Another forest management issue of concern to several interviewees related to road management and decommissioning. In general, community members interviewed did not support or understand the rationale for road decommissioning, and viewed it as a large waste of money. Instead, they believed that money spent on decommissioning would be better spent on road maintenance, which they thought was cheaper and had the benefits of long-term job creation. Road decommissioning also reduces forest access, which was unpopular. Representatives of watershed groups interviewed had different views of this issue. They believed forest roads were the main sediment producers in the watershed, and that the KNF was not adequately addressing the roads problem through improvements, storm proofing, or decommissioning.

Noxious weeds were another local concern. Although invasive species did not seem to be having a major economic impact on local communities, watershed group and Karuk interviewees worried that the KNF would use herbicides to control them. They were opposed to the use of herbicides because they pose a threat to fish, drinking water, and plants used for cultural purposes.

The limited ability of the KNF to engage in active forest management under the Plan, and to provide forest-based jobs, had some broader implications that were raised by interviewees. First, over 60 percent of the land in Siskiyou County is federally owned. The county government did not think federal forest lands were productive or provided jobs to county residents or were a source of tax revenues. Consequently, it had adopted a policy statement expressly opposing any net increase in federally owned land and decrease in privately owned land in Siskiyou County. Additional federal land acquisition was viewed as limiting economic benefits and opportunities for local people. Second, some interviewees believed that the inability of the KNF to undertake active forest management raised the question of whether some of that land should be transferred to local tribal ownership. If tribes had authority to manage the forest, they might not be subject to Plan constraints, and might do a better job of forest management and creating socioeconomic benefits for communities.

Chapter 5: Conclusions



Meeting Northwest Forest Plan Goals and Expectations

To conclude, we draw on the data presented in this report to assess how well the socioeconomic goals and expectations of the Northwest Forest Plan (the Plan) were met during the first 10 years on the Klamath National Forest (KNF). We also respond to the two socioeconomic monitoring questions posed in the Plan Record of Decision. We then identify lessons learned from the monitoring work that may be useful in the adaptive management context. Our findings from the Klamath case study were used, together with findings from three other case-study areas in the Plan region (the Olympic and Mount Hood National Forests and the Coos Bay Bureau of Land Management District) to draw conclusions about the effectiveness of the Plan in meeting its socioeconomic goals at the regional scale (see Charnley 2006).

Question 1—Are predictable levels of timber and nontimber resources available and being produced?

Goal 1: Produce a predictable and sustainable level of timber sales and nontimber resources that will not degrade or destroy the environment.

Timber—
Timber outputs were not predictable. Under the Northwest Forest Plan and the Klamath Forest Plan, the KNF allowable sale quantity (ASQ) was set at 51 million board feet annually. This level represents about 25 percent of the average annual volume of timber harvested during the 1980s. The KNF has met ASQ twice since 1995, in 1996 and 1997. Since then, the annual volume of timber offered for sale has fluctuated, but has been under the ASQ. The reasons for not meeting ASQ were many, including limited land base for commercial timber harvest, the social acceptability of harvest methods, regulatory requirements associated with the Plan (especially survey-and-manage requirements), the high costs of timber sale preparation, insufficient budgets, appeals and litigation, and risk-averse behavior on the part of decisionmakers.

Special forest products—
Trends in the volume of special forest products sold differed by product. The volume of convertible special forest products sold (fuelwood and Christmas trees) declined between 1990 and 2002. Interviewees associated the decline in fuelwood with the decline in the KNF timber program under the Plan. The volume of poles and posts sold remained fairly stable during the period. Trends for nonconvertible products varied. The quantity of mushrooms sold increased, the quantity of limbs and boughs sold decreased, and the quantity of cones sold remained steady overall.

Grazing—
The grazing program on the KNF declined slightly since 1994. The major factor contributing to this decline was prolonged drought. However, interviewees also cited grazing restrictions associated with the Plan's Aquatic Conservation Strategy, and reduced forage availability associated with the decline in timber harvest activity, as contributing to this decline.

Minerals—
The volume of salable minerals removed fluctuated considerably, and was substantially lower than the volume removed during the 1980s. Locatable minerals activity declined. Leasable minerals activity remained constant.

Recreation—
The recreation program has remained fairly stable overall. Interviewees reported increases in river rafting, recreational mining, and backcountry use. Trail and facilities maintenance was lagging. There was a slight decrease in roads and associated recreation opportunities.

Question 2—Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management?

Of the 37 census block group aggregates (or "communities") that are within 5 miles of the KNF, 4 (11 percent) increased in well-being, 19 (51 percent) decreased in well-being, and 14 (38 percent) showed little change between 1990 and 2000, according to the index developed for this monitoring program. Of the three case-study communities (which collectively represent 6.5 block group aggregates), two decreased in well-being (Scott Valley and Mid-Klamath) and one stayed the same (Butte Valley) between 1990 and 2000. To what extent were these changes associated with federal forest management?

In the early 1970s, the wood products industry accounted for 31 percent of total employment in northern California counties within the range of the northern spotted owl (*Strix occidentalis caurina*) (FEMAT 1993: VII-53). By 1985-89, the industry accounted for 15 percent of total employment in the region, half of what it had been a decade earlier. This decline in timber-industry employment was accompanied by substantial restructuring in the forest products industry, away from older large log mills to more capital-intensive small log mills. People interviewed for this study estimated that by 1992, half of all timber mills in the Klamath region had closed. They enumerated 34 mill closures that occurred within 100 miles of the KNF between 1994 and 2003. Interviewees reported that no sawmills, and only one veneer mill, remained in Siskiyou County in 2003. These closures were not necessarily due to federal forest management policy alone; the timber industry had been undergoing change for more than a decade prior to the Plan, with negative effects on timber workers. Interviewees cited trade treaties, international competition, export policies, and California's increasingly burdensome business and resource management regulations as all contributing to the decline of the local timber economy.

The Endangered Species Act listing of the northern spotted owl, court injunctions that halted the flow of federal timber, and the Plan contributed to the pressures that were already being felt as a result of the timber industry decline in northern California. Of the three communities studied, the most severe effects occurred in the Mid-Klamath community. This community is virtually surrounded by the KNF, had a timber economy that was mainly dependent on federal timber, is more remote, and was less economically diverse than the other two case communities. The reduction in timber harvesting on the KNF spurred the outmigration of many timber workers, Forest Service employees, and their families from these communities. This outmigration in turn triggered other social and economic community impacts and caused a loss of community capacity that has been slow to rebuild.

Nevertheless, communities are adapting in their own ways. The Scott Valley and Butte Valley communities have been sustained to some degree by having strong agricultural components. Butte Valley is located along a major transportation corridor, and is not far from the regional center of Klamath Falls, Oregon, which offers job opportunities. Scott Valley is likewise within commuting distance of the regional center of Yreka, California, and the Interstate-5 corridor. Retirees have moved into all three communities. And the Karuk Tribe has played a fundamental role in contributing to community development in the Mid-Klamath. For the most part, community members interviewed did not vie w the Forest Service as helping them adapt to changes brought about by forest management policy in any meaningful way.

Goals 2 and 3: Maintain the stability of local and regional economies on a predictable, long-term basis. Where timber sales cannot proceed, assist with long-term economic development and diversification to minimize adverse impacts associated with job loss.

We assessed several socioeconomic benefits that the KNF provides that potentially contribute to community well-being and long-term economic development and diversification in local communities. These included timber and nontimber forest products and recreation opportunities, agency jobs, procurement contracts for land management, community economic assistance, and payments to county governments.

Interviewees from all three communities reported that the KNF did not contribute to socioeconomic well-being in their communities by providing timber, as it once did. The small mills that remained in Butte Valley did not use national forest timber. Scott Valley had few remaining timber workers. Those Mid-Klamath residents who were still trying to make part of their living in the wood products industry were frustrated by the lack of reliable supplies of federal timber, which made it difficult for them to make a living. The KNF did play an important role in providing local ranchers with grazing allotments that are critical to their viability. However, the Plan standards and guidelines reportedly increased ranchers' operating costs on national forest land. Mining was negligible, except for recreational mining. Special forest products were important to tribes. The Plan had hampered the ability of the KNF to manage for cultural products desired by tribes, however. Matsutake (*Tricholoma magnivelare*) mushrooms had commercial importance, but provided little in the way of economic benefit to local residents; most harvesters and buyers came from outside the area. These harvesters did support local businesses when they were in town. Interviewees had mixed views about the KNF's contributions to recreation and tourism development.

The KNF went from having 636 employees in 1993, to 441 in 2003, a loss of 31 percent. Although this decline was not as severe as that on many Pacific Northwest Region Plan-area forests, it had a strong impact on local employment opportunities, particularly in the Mid-Klamath, which saw several of its ranger district offices close or consolidate in the 1990s.

Between 1990 and 2002, the KNF spent $44.5 million procuring land management services. Most of this spending (64 percent) took place between 1990 and 1993. After 1993, contract spending on the KNF dropped off sharply. Between 1990–92 and 2000–2002, contract spending declined 78 percent. The KNF's large reduction in procurement spending was considerably greater than that in the Plan area as a whole, but it was comparable to the decline in contract spending that occurred on other northern California forests. Interviewees from the case communities viewed contracting on the Klamath as having contributed some local opportunities for residents. However, the season of work was often restricted to a few months during the summer, and contracts were sporadic, making it difficult to rely on them as a steady source of employment.

The Northwest Economic Adjustment Initiative (NEAI) brought nearly $2 million in grant money to the KNF over 9 years. Most of the NEAI money became available during the first 4 years of the Plan. Rural community assistance grants made up most of this funding. Rural Community Assistance grants were often used by communities to leverage money from other sources through matching grants and other means, so that the total benefit they provided was far beyond their face value. Not only did the NEAI provide economic assistance to communities, the way in which it was administered caused new collaborative relationships to form between the KNF and communities. In general, NEAI money from the KNF and other agencies supported some worthwhile projects in communities–particularly in the arena of community planning and infrastructure development. It did not, however, assist displaced timber workers, or result in sustainable local job creation.

Northwest Forest Plan mitigation measures resulted in substantially higher payments to counties than would have been received through forest revenue sharing alone given diminishing timber harvests. The Secure Rural Schools Act provided the highest level of payments to counties since 1990. In addition to being an important source of revenue to support roads and schools countywide, payments to counties under the Secure Rural Schools Act have contributed a significant amount of money to support local resource-related projects on and around the KNF. The Siskiyou County Resource Advisory

Committee (RAC) was an important source of funding for joint forest stewardship projects. It made over $1.7 million available for resource-related projects on both private and national forest lands in the county between 2001 and 2003. The RAC money not only promoted joint forest stewardship; it was a source of new grant money to communities that saw NEAI funds largely disappear. Many interviewees expressed concern over the fact that the Secure Rural Schools Act provisions expire in 2006.

The overall picture of changing socioeconomic benefits from the KNF since the Plan was adopted is one of decline. Mitigation measures associated with the Plan have helped in some small ways, but not nearly at a scale that compensates for this loss of benefits.

Goal 4: Promote agency-citizen collaboration in forest management.

The formal institutions established under the Plan to promote agency-citizen collaboration in KNF management (Provincial Advisory Committees [PACs] and Adaptive Management Areas [AMAs]) apparently did not live up to expectations, although we did not systematically investigate their effectiveness. The evidence we did gather suggests that PACs have provided an important forum for communication about forest management issues, and for multiparty monitoring of forest management projects, but have not been a vehicle for collaborative decisionmaking.

At the community level, between 1994 and 2003, relations between the KNF and most community stakeholder groups grew more distant. Community interviewees viewed the KNF and forest management issues as becoming less relevant to their daily lives.

Initially, there were sincere attempts at collaboration to successfully implement the Plan and to achieve its objectives. However, community groups grew frustrated as Plan-related collaborative efforts failed to achieve their goals. There has been a growing view that forest managers do not have control over local decisionmaking, and have their hands tied by regulatory requirements, appeals, and litigation. Thus, why invest energy in collaboration? Moreover, local communities had a limited capacity to engage in collaboration. Their ability to collaborate depended on the presence of organized groups, local leaders, and members that had the time, money, and motivation to get involved. On the agency side, the reduction in on-the-ground KNF personnel, and the emphasis on interagency collaboration, made it harder for the agency to interact with local communities. The successes that have occurred have often been the result of individual KNF personnel who took the initiative to make a local program or collaborative effort work.

Alhough not related to the Plan, RACs and fire safe councils were viewed as holding some promise for collaborative forest stewardship. Grants and agreements that support partnerships in forest stewardship projects were also providing a growing avenue for collaboration.

Goal 5: Protect the forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems.

The vast majority of interviewees said that timber harvest practices on the KNF prior to the Plan were unacceptable, and undermined the health of the forest. The Plan was seen as putting a stop to environmentally-destructive forest management practices. However, there was widespread agreement that some silvicultural activity, particularly thinning, was necessary to promote forest health. Most interviewees viewed the minimal amount of active forest management that occurred under the Plan as being detrimental to the forest, and as undermining many of the forest values and environmental qualities that the Plan was designed to enhance. They commonly cited the increased fire risk to spotted owl habitat as an example of this problem. Some forest protection measures associated with the Plan–particularly survey-and-manage requirements–were viewed by many interviewees as being overly protective. Other people felt the Plan had not gone far enough in protecting old-growth habitat. Interviewees reported the greatest successes in the arena of aquatic ecosystem conservation.

Management Implications

It was unrealistic to think that Plan mitigation measures could have compensated for the dramatic downturn in the northern California owl-county timber economies that had been ongoing since the 1970s. By the time the Plan was signed, the region's timber sector had already lost half to three-quarters of its job base and milling capacity. Even if the Plan had successfully met its goals and expectations, communities would have experienced dramatic changes associated with the timber industry decline. The question now is, how can the KNF provide communities with socioeconomic benefits that will help them better adapt to change, and that will contribute to community well-being?

The monitoring data gathered through this study have a number of management implications. The intent of this section is not to provide recommendations, but to summarize the ideas expressed by interviewees and the authors regarding how the KNF might interact better with local communities, and provide more socioeconomic benefits to them.

Timber production—
Many interviewees believed the KNF should try to meet ASQ and provide a predictable supply of wood products to support community economic development efforts, and live up to the unfulfilled public expectations and Plan commitments. They viewed survey-and-manage requirements as a major impediment to meeting timber targets. Interviewees also viewed appeals and litigation as major factors in stalling or preventing timber sales. There were two suggestions for addressing this problem. One was to target sales in areas that are not located on steep slopes or in key watersheds, and to avoid cutting old-growth trees (defined as trees that are 80 years or older). Another was to engage in close monitoring of timber harvest activities to ensure that timber harvest contractors were complying with the terms of their contracts. Such monitoring would help build community trust, and perhaps make it easier to implement timber harvest and thinning programs. Interviewees also felt it was important for the KNF to continue providing local residents with special forest products that are important to them, such as fuelwood, mushrooms, and basketry materials.

Grazing—
Timber workers were not the only local residents who were affected by the Plan. Ranchers were also experiencing stress, which they attributed in part to more stringent grazing requirements under the Plan. Measures that could assist ranchers include active range restoration to increase grazing opportunities, working with ranchers to promote hunting or bird-watching opportunities on their ranches, and continuing communication and sensitivity to their needs.

Recreation and tourism—
Some community residents believed that the KNF had not delivered on Plan expectations related to investment in recreation and tourism development. They wanted to see better maintenance of existing facilities and development of new recreation infrastructure to attract visitors. They would also appreciate some developments that cater to the recreational interests of local residents. Budgetary and staffing constraints on the KNF have made it difficult to maintain, much less expand, recreation infrastructure there. However, the recreation developments that have occurred, such as the east-side snowmobiling program, were viewed as beneficial by many community residents, and enjoyed local support. There is an opportunity to engage community residents who have an interest in recreation and tourism development in partnerships or volunteer efforts designed to maintain and develop KNF recreation infrastructure. By pooling resources, both the KNF and local communities could benefit.

Contracting—
Several of the contractors interviewed expressed concerns that contracting bids from some nonlocal contractors were sometimes falsified to meet agency specifications, specifically wage requirements. Contract

awardees were able to undercut local competitors because they paid their workers lower wages to make up for low bids. Local contractors wanted to see the KNF inspect bids more closely to identify false ones. They also wanted to see the KNF bundle contracts wherever possible to reduce the burden of paperwork, take past success in carrying out contracts into account when awarding new ones, and make more effort to target contracts to local businesses.

Partnership agreements may be more flexible and avoid some of the institutional barriers that keep contracting from providing more benefits to local residents. These were encouraged, but their success depends on local organizational capacity, and the ability of partners to contribute a share of the costs of a partnership agreement.

Community economic assistance—
Interviewees' observations about community economic assistance money and training opportunities delivered by the KNF were that these could be more successful if they were longer lived, delivered in a more timely way in response to local need, and focused on creating sustainable family-wage jobs locally. It was apparent that community residents were not very aware of the economic assistance that the KNF does provide. By increasing public awareness of the contributions the KNF has made, its image and relations with the public would likely improve.

Communication—
Agency employees were viewed as information conduits and were also valued as technical advisors on resource management and economic development issues. Community interviewees wanted to interact more with KNF employees. Several interviewees said that interaction works better in small groups than in big meetings. They were disappointed that one-on-one interaction with KNF personnel had become rare because of the scarcity of KNF employees in the field. It was clear from the interviews that many local residents observed management actions that the KNF takes–such as road decommissioning–but did not understand the rationale for them, and did not support them as a result. It was also clear that several residents did not understand the rationale for not undertaking other management actions–such as removing snags. Better communication about the reasons behind forest management activities (or lack thereof) would likely enhance community-forest relations.

Collaboration—
Most interviewees believed that there was no point in attempting to collaborate with the KNF on resource management decisionmaking. Past attempts had been frustrated, agreements had been undermined by single dissenters, input was ignored, appeals and litigation halted plans that had been collaboratively developed, or decisionmakers were seen as powerless. For example, many stated that higher level decisionmakers from the Pacific Southwest Region office were the agency representatives that they wanted to interact with more because they believed these people–not local KNF line officers–were empowered to respond to their needs and concerns.

More success was reported in the arena of collaborative forest stewardship. The Siskiyou County Resource Advisory Committee was viewed positively and seen as helping to build positive relations between the KNF and local communities. The RAC projects provided local people with a decisionmaking role in forest stewardship, created local jobs, and built relations between communities and forests. Continuing to invest in RAC projects should have positive outcomes. However, not all communities are engaged in the RAC process. Fire safe councils, also new, were viewed positively in terms of their ability to promote forest-community relations. The people involved expressed a desire to better coordinate their activities on private lands with fuels reduction activities carried out by the KNF.

The KNF could also take more advantage of opportunities to become involved in projects that are meaningful

to the community, where they share common values, as a way of building relations and contributing to well-being. For example, youth programs such as Youth Conservation Corps promote resource education and job training. Local historic event celebrations, interpretation, and recreation and tourism development are examples.

Finally, community interviewees emphasized the importance of the district ranger as pivotal in building positive relations, collaboration, and working to provide communities with forest benefits.

Fuels management—
Many community interviewees viewed fuels management as the most needed and appropriate management activity that the KNF could undertake. Fuels management would reduce fire risk to nearby property owners, communities, and wildlife habitat. By reducing fire risk, the KNF would be viewed both as a better neighbor and a better steward of the forest, which would help improve community relations. Fuels management through thinning could also provide wood products that a number of community residents were interested in: fuelwood, a reliable supply of fuel for biomass cogeneration plants that there was interest in developing, and material from which to produce value-added wood products.

The KNF has tried to be more proactive in fuels reduction, but has been constrained by Plan requirements. This suggests that the Plan is not sensitive to regional variations and needs, and does not effectively provide the flexibility needed by managers to manage forests differently in different ecological zones. A more flexible Plan would take into account local needs and variations, as, for example, the Sierra Nevada Framework Project has tried to do.

More effort to involve local residents in fuels management work would also help the KNF rebuild ties with local communities that have been lost since logging declined. Community members formerly were on the KNF regularly, logging and interacting with agency personnel. Although some people now help fight fires when they occur, or engage in forest restoration work, the scale at which communities interact with the KNF and agency employees has declined dramatically. Fire safe councils have helped in this regard, although their work is restricted to private land. Using the money now available through the National Fire Plan to hire local residents to help with fuels management work is one way of rebuilding these ties. Greater involvement by the KNF in resource education and training programs that are targeted toward careers in the fire sciences is another avenue. Coordination with the California Department of Forestry and the College of the Siskiyous to develop apprenticeship programs would help lead to local natural-resource-based jobs.

Forest-based jobs—
Local residents wanted family-wage jobs tied to natural resources that enable them to stay in their communities and maintain family ties. Timber jobs used to provide this but no longer do. Any opportunities to find new ways of creating such jobs by identifying arenas in which natural resources can be tied to community development–for example, through fire management work, supplying forest products to support local business enterprises, or through forest restoration work–would make an important contribution to community well-being.

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Metric Equivalents

When you know:	Multiply by:	To get:
Acres	0.405	Hectares
Board feet, log scale	.0045	Million cubic meters
Miles	1.609	Kilometers
Pounds	.454	Kilograms

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Appendix A—People Interviewed for This Study

Klamath National Forest

Respondent's position	Additional roles on the forest
Forest landscape architect	Interpretation, partnerships, recreation
Forest resource staff officer	Fisheries, noxious weeds, earth sciences, timber, wildlife
District ranger	Contracting, forest stewardship
Deputy forest supervisor	Budget, tribal relations, forest stewardship, contracting
Forest silviculturist	Nontimber forest products, project planning issues
District resource staff	Recreation, range, noxious weeds, archaeology, minerals
District archaeologist	Partnerships
Forest timber mgmt officer, Klamath National Forest; timber contracting officer, Shasta Trinity National Forest	Contracting, timber, forest stewardship
Forest earth science, fisheries program manager	Partnerships, environmental education, contracting
Forest administrative staff officer	Contracting, community assistance program, volunteer programs
Forest environmental coordinator	Planning
District recreation, lands/minerals staff	
Forest fire management staff officer	
Forest assistant engineer	Contracting, roads
Wildlife biologist	

Scott Valley

Respondent's position	Additional stakeholder roles	Scott Valley resident
Reforestation nursery owner		X
Director, nonprofit natural resources consulting and training center	Natural resource management consultant/ contractor	X
Local mayor		X
Natural resource management interest group member		
Former county supervisor	Natural resource management interest group director	X
Rancher	Rural conservation district member	X
County board of education member	Member of timber worker family	
Superintendent of schools (retired)		X
Forester	Tree farmer	
County supervisor		X
Wood products company manager (2)		
Wood products company employee	Forester	
Wilderness outfitter (2)	Natural resource management consultant/ contractor	X
Shasta Tribe member	Feller, timber hauler (retired)	X
Shasta Tribe member	Member of former timber worker family	X
County behavioral health specialist	Member of former timber worker family	X
State Department of Forestry acting unit chief		X
County Economic Development Corporation director		
County natural resource specialist		X
Environmental interest group member		X
County planning director		X
U.S. Forest Service district ranger (retired)		X
Salmon River Restoration Council representative	Member fire safe council, local contractor, board member Mid-Klamath Watershed Council	X

Butte Valley

Respondent's position	Other stakeholder roles	Butte Valley resident
County Supervisor	Klamath Provincial Advisory Committee member, Ore-Cal Resource Conservation and Development (RC&D) Director, rancher	X
Ore-Cal RC&D	Economic development, tourism	
Butte Valley Saddle Co. owner, Chamber of Commerce president		
Dorris Lumber & Molding		X
Vintage Woodworks owner		X
Shasta Tribe member, local environmentalist		X
Shasta Tribe member, former timber feller		X
Whitsell Mfg., Inc. (lumber remanufacturing)		X
TC Ranch owners		X
Butte Valley Fire District Fire Chief	Cal Or Telephone Co.	X
Butte Valley Health Center		
Butte Valley Unified School District Superintendent		X
Butte Valley school district employee		X
Mayor of Dorris		X

Mid-Klamath

Respondent's position	Other stakeholder roles	Mid-Klamath resident
Local business owner/leader	County school board member, contractor, ex-mill worker	X
Fishing outfitter/guide	Local school board member	X
Director, Happy Camp Family Resource Center (provides social services)	Local school board member, tribal council member	X
Retired Happy Camp district ranger	Member, Fire Safe Council, health clinic board member	X
Rancher	Retired Forest Service employee	X
Miner, logger	Member, People for the USA	X
Director, Karuk Economic Development Organization	Karuk tribal member, Vice President Happy Camp Chamber of Commerce, Chairman Happy Camp Action Committee	X
Mid-Klamath Watershed Council representative	Klamath Forest Alliance representative	
Local business owner		X
Regional forest manager, fruit growers		
Karuk tribal member, special forest products gatherer	Basket maker	X
Logger		X
New 49ers recreational mining club representative		X
Forest contractor	Ex-logger, local business owner	X
Outfitter-guide, owner, local river rafting company		X
President, Happy Camp Chamber of Commerce	Local business owner, Resource Advisory Committee member	X
Treasurer, Chamber of Commerce	Married to ex-logger, local business owner	X
Chair, Karuk Tribe		X
Vice Chair, Karuk Tribe		X
Secretary, Karuk Tribe	Spouse of former timber worker	X
Anthropologist		X
Klamath-Siskiyou Wildlands Group representatives (2)		1

Appendix B—Categories of Interviewees

When conducting interviews in the case-study communities, we attempted to select people that represented a cross section of community leaders and stakeholder groups. We used the following categories to guide our selection:

Community leaders:

Elected official
Civic group leader
School district/education leader
Historic preservation/cultural center leader
Economic development council leader
Business leader/store owner
Social service provider
Fire district leader
Health official
Religious leader
Watershed council representative
Large landowner (timber company?)
Planner
Tribal council members

Stakeholder group representatives:

Recreation/tourism
Environment
Timber industry
Special forest products
Fishing—commercial/recreational
County government
Agriculture/ranching
Minerals
Tribes
Low income/minority groups

It was not possible to interview someone from each of the categories in every community, and many interviewees represented several categories at once.

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