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

Socioeconomic Monitoring of the Olympic National Forest and Three Local Communities

Lita P. Buttolph, William Kay, Susan Charnley, Cassandra Moseley, and Ellen M. Donoghue

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

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This report examines socioeconomic changes that occurred between 1990 and 2000 associated with implementation of the Northwest Forest Plan (the Plan) in the Olympic National Forest in western Washington. We used a combination of quantitative data from the U.S. census and the USDA Forest Service, historical documents, and interviews from Forest Service employees and members of three case study communities—Quilcene, the Lake Quinault area, and the Quinault Indian Nation. We explore how the Plan affected the flow of socioeconomic benefits associated with the Olympic National Forest, such as the production of forest commodities and forest-based recreation, agency jobs, procurement contract work for ecosystem management activities, grants for community economic assistance, payments to county governments, and opportunities for collaborative forest management.

The greatest change in socioeconomic benefits derived from the forest was the curtailment of timber harvest activities. This not only affected timber industry jobs in local communities, but also resulted in declining agency budgets and staff reductions. Mitigation efforts varied. Ecosystem management contracts declined and shifted from labor-intensive to equipment-intensive activities, with about half of all contractors from the Olympic Peninsula. Economic assistance grants benefited communities that had the staff and resources to develop projects and apply for monies, but provided little benefit to communities without those resources. Payments to counties served as an important source of revenue for rural schools and roads.

We also examine socioeconomic changes that occurred in the case study communities, and the influence of forest management policy on these changes. Between 1990 and 2000 all three communities showed a decrease in population, an increase in median age, a decline in timber industry-related employment, and an increase in service-industry and government jobs. Quilcene's proximity to the larger urban centers has attracted professional and service industry workers that commute to larger economic hubs. Lake Quinault area residents are increasingly turning to tourism, and its growing Latino population works in the cedar shake and floral greens industries. For the Quinault Indian Nation, employment in tribal government and its casino has helped offset job losses in the fishing and timber industries. Many changes observed in the communities were a result of the prior restructuring of the forest products industry, national economic trends, and demographic shifts. However, for Quilcene and Lake Quinault, which were highly dependent on the national forest for timber and served as Forest Service district headquarters, the loss of timber industry and Forest Service jobs associated with the Plan led to substantial job losses and crises in the economic and social capital of these communities.

Keywords: Socioeconomic, monitoring, Northwest Forest Plan, Olympic National Forest, Quilcene, Lake Quinault, Quinault Indian Nation.

Preface

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

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

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

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

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

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

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

The ROD monitoring plan provided a very general framework to begin development of an interagency monitoring program. It identified key areas to monitor, initial sets of questions, types and scope of monitoring, the need for common protocols and quality assurance, and the need to develop a common design framework. In 1995, the effectiveness monitoring program plan (Mulder et al. 1995) and initial protocols for implementation monitoring (Alegria et al. 1995) were approved by the Regional Interagency Executive Committee. Approval of the effectiveness monitoring plan led to the formation of technical teams to develop the overall program strategy and design (Mulder et al. 1999) and monitoring protocols for late-successional and old-growth forests (older forests) (Hemstrom et al. 1998), northern spotted owls (Lint et al. 1999), marbled murrelets (*Brachyramphus marmoraturs*) (Madsen et al. 1999), tribal (USDA and USDI 2002), and watershed condition (Reeves et al. 2004). Socioeconomic monitoring protocols continue to be tested (Charnley 2006).

Periodic analysis and interpretation of monitoring data is essential to completing the monitoring task. This important step was described in the overall monitoring strategy (Mulder et al. 1999), 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 is linked to the socioeconomic monitoring 10-year interpretive report (Charnley 2006). 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.

Contents

Chapter 1: Overview of the Northwest Forest Plan Socioeconomic Monitoring Program

This case study was undertaken as part of the Northwest Forest Plan (the Plan) Socioeconomic Monitoring Program. It is one of four case studies conducted during 2003 for the purpose of assessing the effects of the Plan on rural economies and communities within the range of the northern spotted owl (*Strix occidentalis caurina*). This document is a supplement to Charnley (2006), which presents socioeconomic monitoring results for the Plan area from 1990 to 2003. It contains details not found in that report, and is intended to be useful to the Olympic National Forest and surrounding communities. The three case "communities" associated with the Olympic National Forest are (1) the community of Quilcene, (2) the Lake Quinault area, and (3) the Quinault Indian Nation (fig. 1).

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 non-timber 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), and to contribute to community well-being. Third, where timber sales could not proceed, the goal was to minimize adverse impacts on jobs by assisting with long-term economic development and diversification opportunities in those rural communities most affected by the cutbacks (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 et al. 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 that members of the public cared deeply about (Clarke 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 (Clinton and Gore 1993, Tuchmann et al. 1996: 6, 44–48). Greater collaboration in forest management was also expected between agencies and citizens (Danks and Haynes 2001: 54).

One component of the monitoring program uses case studies to investigate how the Plan has been implemented on individual forests within the Plan area, and how resultant shifts in forest management have affected forest users and surrounding communities. This document reports the results of one of these case studies. Specifically, we looked at how the flow of socioeconomic benefits associated with the Olympic National Forest has been affected by the Plan. The socioeconomic benefits we examined include the production of forest commodities (timber, nontimber forest products) and forest-based recreation; agency jobs; procurement contract work (focusing on ecosystem management activities); grant money for community economic assistance; benefits associated with payments to county governments; and opportunities to engage in collaborative forest management and stewardship activities, including partnership agreements.

The remainder of chapter 1 provides a description of our methods, followed by a brief background description of the Olympic Peninsula and the three case-study communities. Chapter 2 focuses on the flow of socioeconomic benefits from the Olympic National Forest between 1990 and 2002, and how the Plan has influenced that flow. Chapter 3 turns to the three communities and examines changes

Figure 1—The Olympic National Forest and three case-study communities.

that took place in those communities between 1990 and 2003 and the influence of forest management policy; ways the communities have adapted to change, and the role of the forest in providing assistance; and, changing relationships between the forest and the communities over time. Chapter 4 looks at issues relating to the management of the Olympic National Forest. It discusses collaboration and joint forest stewardship between the forest and the communities, how well forest management under the plan is providing for the forest values and environmental qualities local residents care about, current issues and concerns relating to forest management, and the views of community interviewees regarding what has and has not worked well about the Plan. Chapter 5 concludes by discussing the two monitoring questions and the five socioeconomic goals of the Plan. It assesses how well these goals have been met and attempts to answer the monitoring questions within the context of the Olympic case study.

Methods

Analytical Framework

The monitoring team relied on quantitative and qualitative data to develop the case studies and regional report. The baseline year for the socioeconomic monitoring program is 1990. To answer the first evaluation question—Are predictable levels of timber and nontimber resources available and being produced?—we obtained quantitative and qualitative data on timber sales, special forest products, grazing, mining, and recreation from Forest Service and Bureau of Land Management (BLM) databases, planning documents, and resource specialists. All of the monitoring teams associated with the Pacific Northwest Interagency Regional Monitoring Program were directed to obtain agency data from corporate databases, publications, or other sources available from agency national, regional, or state offices rather than requesting data from individual Forest Service and BLM field units (unless warranted by special circumstances). For the Olympic National Forest, we had access to their monitoring reports from their Web site, but consistent data were only available from 1999 onward. Thus, we relied primarily on the data from the national database, which set limitations on data availability and data quality.

The analytical framework adopted by this module calls for showing that changes reflected by the trend data were caused by management actions under the Plan, or for providing alternative theories that could explain the changes observed. The team investigated links between trends in resource and recreation outputs, management actions under the Plan, and other explanatory variables by using a case-study approach. We selected four forests from four different planning provinces in the Plan area for detailed study: the Olympic National Forest, the Mount Hood National Forest, the Klamath National Forest, and the Coos Bay BLM District. For this case study, we interviewed 24 Forest Service employees from the Olympic National Forest. 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 Forest Service and BLM to produce predictable quantities of timber sales and nontimber resources. Our team believes that understanding how the Plan has contributed to the observed trends is necessary for making informed policy decisions that address undesirable trends.

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. For some resource indicators (such as much of the recreation data), we could obtain status but not trend data. We report the status data to provide a baseline for future monitoring. In some cases (such as minerals and special forest products), the resource data tracked by the agencies did not serve as adequate indicators for answering the monitoring question directly. Nonetheless, we believe that providing some information about trends in these resource areas is better than providing no information

at all. Thus, we made the most of the available data, assessing what we could learn related to the monitoring question and goal.

The second evaluation question has two components (Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management?). 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 residents of forest-based communities. These benefits included jobs and income associated with forest resources and recreation, agency jobs, and procurement contracting opportunities. We examined local-scale trends for the four case-study forests by 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 creating new jobs in ecosystem restoration, the Northwest Economic Adjustment Initiative, and providing a safety net for payments to counties to help compensate for the loss of revenue sharing based on timber receipts.

To supplement the quantitative monitoring data, the team employed a community case-study approach to gather and analyze qualitative data from interviews with Forest Service employees and a diverse set of community members. The qualitative data provided a more detailed understanding of the social and economic conditions and trends described by the quantitative data, how changes in the flow of forest benefits had contributed to change in local communities, and how the Plan affected the flow of socioeconomic benefits. These data describe the social and economic effects of the Plan on local communities, and how agency efforts to mitigate Plan impacts did or did not help communities adapt to change. Using the qualitative data, we identify key patterns, themes, and insights that emerge from the cases and use them to advance our understanding of how federal forest management policy is linked to socioeconomic well-being in forest-based communities. These interviews are 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.

Selection of Case-Study Forests

Case-study forests were chosen to represent one national forest in each of the three states that lie within the Plan area, and one BLM unit in Oregon, the only place that the BLM has significant land holdings inside the Plan area. They were also chosen to represent different provinces (the Plan area is broken up into 12 planning provinces). The monitoring program team leader sent a letter to all of the national forests and BLM districts in the Plan area and asked for volunteers to participate in socioeconomic monitoring. We adopted this approach because the monitoring effort was considered a pilot program, and we wanted to conduct it on forests that were interested in participating and making use of the resulting information. Two of the four case-study forests volunteered to participate and were chosen for that reason (the Olympic and the Mount Hood National Forests). We chose the Klamath National Forest because it was previously a high timber-producing forest, and the forest supervisor was supportive of social science work. We selected the Coos Bay District because the BLM Oregon state office recommended it, and the district manager was supportive of social science work. The Coos Bay District also had been a high timber-producing district prior to the Plan.

Selection of Case-Study Communities

Case-study communities associated with each forest were chosen on the basis of a number of criteria. First, the team identified a sampling frame of communities that included all of the census block group aggregates (BGAs) whose polygons lay, at least partially, within a 10-mile radius of the case-study forest boundaries. The team chose this distance because it wanted to focus the monitoring work in forest-based communities and assumed that communities near federal forests would have social, economic, or cultural

ties to those forests. We then met with agency employees from each case-study forest 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 case forest and the managing agency, and which did not exhibit any relationship with the forest. This process narrowed our sample frame.

We selected three communities associated with each case-study forest from the sample frame for monitoring because time and budget constraints did not allow for a larger community sample. We recognize, however, that in only choosing three communities around each forest, we might not capture all of the variation in community "types," or in community-forest relations in each case-study area. We initially chose case-study communities randomly from a stratified sample. We stratified communities within the sample frame on the basis of their socioeconomic well-being measure in 1990, by using three categories: high, medium, and low. We randomly chose one community from each stratum, unless there were no communities in one of the strata.

Once in the field, however, it soon became apparent that the communities initially selected through this approach would provide only a very limited understanding of the impacts of the Plan on communities within the Olympic National Forest (i.e., they had very few connections to the forest, were not located on the Olympic Peninsula, or only covered a very narrow geographic range). We thus drew upon the advice of key informants at the Olympic National Forest, as well as upon our own observations during preliminary fieldwork, to identify three communities that would illustrate a broader range of responses to the socio-economic changes taking place on the Olympic Peninsula during the 1990s. We then used the census block group delineations that encompassed the selected communities for the purposes of bounding the communities and analyzing census data.

For this case study, the three communities selected were Quilcene, the Lake Quinault Area (Quinault-Neilton-Amanda Park), and the Quinault Indian Nation (Taholah-Queets). We were also interested in including communities that had potentially different orientations to the forest. Preliminary field visits and discussions with Forest Service employees and local residents led us to believe that the three communities—Quilcene, Lake Quinault Area, and the Quinault Indian Nation—corresponded to timber, recreation, and tribal orientations, respectively. Only later did we discover that Quilcene and the Lake Quinault communities were probably more highly dependent on timber from the Olympic National Forest than most other peninsula communities, thus potentially biasing our results toward greater impacts on timber workers. Our results may be also biased toward greater impacts from Forest Service downsizing owing to the presence of district offices at both Quilcene and Lake Quinault. For the Quinault Indian Nation, we found that because of the tribe's relatively large land base, its relationship with the Forest Service was quite different from other communities (both tribal and nontribal), and thus was not necessarily representative of other peninsula tribes. We included the Quinault Indian Nation case because we felt that it illuminated the variability among peninsula communities, the relationship with Olympic National Forest, and responses to the Plan.

Once we selected the case communities, we used the interview process to determine how the communities should be defined for case-study purposes. The census BGA delineations were used for initially selecting case communities; however, the model we used did not necessarily correspond geographically to the place that community members considered to be "their community." Thus the BGA community delineations were starting points for defining study communities, but we adjusted those definitions once we got to the field and learned how local residents conceptualized their community. Chapter 3 provides a more detailed description of the final community boundaries for each case study.

Census Statistics

We compared U.S. census statistics from 1990 and 2000 for the case study communities (i.e., census BGAs) to determine changes in socioeconomic conditions. We selected demographic indicators, such as total population, median age, school enrollment, percentage of population that completed high school, percentage of population with a bachelor's degree or greater, age distribution, ethnicity,

population by race, and Hispanic population. We also looked at economic indicators, such as median household income, percentage of unemployed, percentage living in poverty, household income distribution, and employment by industry. In addition to comparing changes over time within communities, we also compared how the community indicators had changed relative to the same indicators at the county level.

Interviews

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 this chapter. We chose interviewees so as 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 19 people from Quilcene, 14 people from Lake Quinault, and 17 people from the Quinault Indian Nation. Not all interviewees were residents of the communities.[1] Some represented individuals who worked in the community or had a connection to either the community or the portion of the national forest that surrounded the community. In addition, several Forest Service employees were familiar with, worked in, or were long-term residents of the case-study communities, and were thus interviewed about management and resource output changes on the forest as well as changes in community-forest relations and socioeconomic conditions for the case-study communities. A general description of the interviewees from the three communities and forest is provided in the appendix. Because of the potentially sensitive nature of some of the interview questions, the names of interviewees are confidential and are omitted from the list.

After identifying categories of informants to be interviewed in each community and on the forest, we used a snowball sampling approach to locate interviewees. This approach entails locating key individuals in a community, and asking them to identify people who would be appropriate to interview about the topics under study. Snowball sampling is an effective method of building a sampling frame where 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 most of the communities and all of the forest units that we sampled. However, to avoid selecting interviewees belonging to only a narrow segment of the community (a hazard of snowball sampling as pointed out by Jackson et al. [2004]), we also reviewed planning documents and newspaper articles to identify interviewees likely to be knowledgeable about various aspects of community change. The criteria we used to develop our sample frame included people who represented one of the informant categories initially identified; people who had lived in the case community or worked on the case forest at least since 1994, when the Plan was adopted; people who were knowledgeable about the topics under study; people who were considered able to provide a window into the community or the forest; 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 by using an interview guide that contained a list of questions and topics to be covered during the interview (see Charnley 2006). Interviews with community members covered the following topics:

- The role of forest management policy in the socioeconomic changes occurring in their communities between 1990 and 2000
- How their communities have responded to those changes
- How well the Plan has provided the forest values stakeholders consider important

[1] Social scientists have engaged in debates over the concept of community for more than a century. Numerous definitions of community exist; all of them are problematic from the standpoint of how to operationalize them in field studies (Jackson et al. 2004). As noted by Jackson et al. (2004: 226), "Conceptualizations of community range from the conventional community of place (a town) to communities of interest (people sharing common interests), and occupational communities (people united by shared identification and interactions within an occupation)." Drawing on Wilkinson (1991), they point out that a local community can encompass multiple social fields (i.e., place, occupation, membership in civic groups, religious affiliation, etc.). For the purposes of this case study, we adopted a broad definition of community that encompassed social fields in addition to residency in a particular location (e.g., occupation, civic action, forest management interests).

- Current issues and concerns relating to management of the forest
- Trends in Forest Service-community collaboration

During the interviews, we also showed interviewees charts of quantitative data from the U.S. census comparing socioeconomic conditions in 1990 and 2000, and asked them to comment on both the accuracy of the data relative to their community and possible explanations for observed changes. Interviewers took handwritten notes during the interviews and transcribed the notes into a computer word processing file for later analysis. Interviews ranged in length from 45 minutes to 2 hours, depending on the interviewees range of involvement in community activities of relevance to this study and knowledge of forest management and policy. We adopted Mishler's (1986) approach to interviewing, in which interviews are viewed as discourse, or "meaningful speech between interviewer and interviewee as speakers of a shared language" (Mishler 1986: 10–11). Interviews of this sort tend to take on the form of a conversation between the interviewer and informant (Riessman 1993).

Archival Data

We also gathered archival data, including community and agency planning documents, Web sites, newspaper articles, and historical documents to shed light on the types of changes occurring in the communities and potential causes of those changes. The archival data served as an important cross check to interview data, allowing us to verify, clarify, and contextualize statements made by interviewees.

Analysis

In preparing for the initial phase of fieldwork, the entire socioeconomic assessment team, which initially consisted of eight case-study researchers and one database-development specialist, selected the topics listed above for inclusion in the interviews. We conducted data gathering and analysis simultaneously in an ongoing iterative process while in the field. We then refined the analysis after completing the fieldwork, drawing upon archival data and followup clarifying interviews to provide context and to address inconsistencies and contradictions within the interview data for each case. In analyzing the interview data, researchers first sorted the transcribed interview data into the broad analytical categories listed above, a form of closed coding (Emerson et al. 1995). The researchers then used an open coding technique (Emerson et al. 1995: 150–155) to mark reoccurring analytical categories within each of the broad topic areas.

In presenting our data, we used a style that Emerson et al. (1995: 170–174) referred to as a thematic narrative. In thematic narratives, the "writer organizes some of these themes into a coherent 'story' about life and events in the setting studied" (Emerson et al. 1995: 173). In developing thematic narratives, the writer selects "only some small portion of the total set of field notes and then [links] them into a coherent text representing some aspect or slice of the world studied" (Emerson et al. 1995: 173). Thematic narratives allow the researcher to illustrate "distinctions and interconnections between related phenomena" (Emerson et al. 1995: 173).

Limitations of the Study

The scope of this study was limited by two main factors:

(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 in the entire universe of communities located within the Plan area. However, the results do serve as a foundation for developing hypotheses to be tested in future research projects. We view the case communities as an initial sample that will form part of a larger

community sample to be monitored in the future as part of the Northwest Forest Plan socioeconomic effectiveness monitoring program.

(2) Because most of the people we interviewed lived in and around the three case-study communities, the findings tend to privilege the perceptions of 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). As a result, the impacts of the Plan on people living at a distance (i.e., farther than 10 miles) from the Olympic National Forest (e.g., residents of Aberdeen/Hoquiam, Seattle/Tacoma/Olympia metropolitan areas, the Interstate 5 corridor, and other areas of the United States) are not addressed in this study. We recognize that from an economic impact standpoint alone this is problematic, given that wood products processing activities were already shifting away from the Olympic Peninsula prior to the Plan. It is quite possible, and indeed probable, that mill workers outside the immediate area around the Olympic National Forest were affected by the decreased levels of timber harvest on the forest. Similarly, it is also possible that the forest's focus on ecosystem restoration has benefited residents outside the immediate area in terms of recreation and tourism opportunities, improved water and air quality, and other noncommodity outputs. Timing and funding constraints, however, did not permit us to utilize a design that would have allowed us to describe the impacts of the Plan on people located at a distance from the forest.

The Olympic Peninsula: An Overview

The Olympic Peninsula is located in northwestern Washington and includes the counties of Clallam, Grays Harbor, Jefferson, and Mason. The peaks of the Olympic Mountains form the central core of the Peninsula and are primarily under the management of the Olympic National Park. Olympic National Forest forms a ring around Olympic National Park. Other major landownership categories on the Olympic Peninsula include State Trust Lands, managed by the Washington Department of Natural Resources, private industrial timberland, and tribal lands. Major population centers include Port Angeles (with a population of 18,397 in 2000), on the northern tip of the peninsula; Port Townsend (population 8,334), on the northeastern tip of the peninsula; Shelton (population 8,442), on the southeastern portion of the peninsula; and Aberdeen (population 16,461) and Hoquiam (population 9,097), on the southwestern end of the peninsula.

The climate of the peninsula can be characterized as temperate and rainy, although rainfall can be quite variable between the western and eastern sides of the Olympic Mountains. The western portion of the Peninsula receives an average of up to 140 inches of rain per year. The climax vegetation on the western peninsula consists of temperate rain forests composed of western hemlock (*Tsuga heterophylla* (Raf.) Sarg.), western redcedar (*Thuja plicata* Donn ex D. Don), and some Sitka spruce (*Picea sitchensis* (Bong.) Carr) at lower elevations. Currently, Douglas-fir (*Pseudotsuga menziesi* (Mirb.) Franco) composes an important component of west-side stands. The Olympic Mountains create a rain shadow effect on the eastern slopes, where precipitation can often average as low as 40 inches per year. Douglas-fir and western hemlock forests are more characteristic on the drier, eastern side, with a higher proportion of Douglas-fir than on the west side (FEMAT 1993).

The Case-Study Communities

Quilcene

Quilcene is a community of 375 residents located along Hood Canal adjacent to the eastern boundaries of the Olympic National Forest, on the Olympic Peninsula (fig. 2). Quilcene's downtown core lies on Highway 101, a well-traveled tourist route, 25 miles south of the Jefferson County seat, Port Townsend, 73 miles north of the state capital, Olympia, and less than 2 hours from Seattle. Expanding out from the downtown core there are limited commercial and industrial areas, a public school, and residential development to the north, southeast, and east.

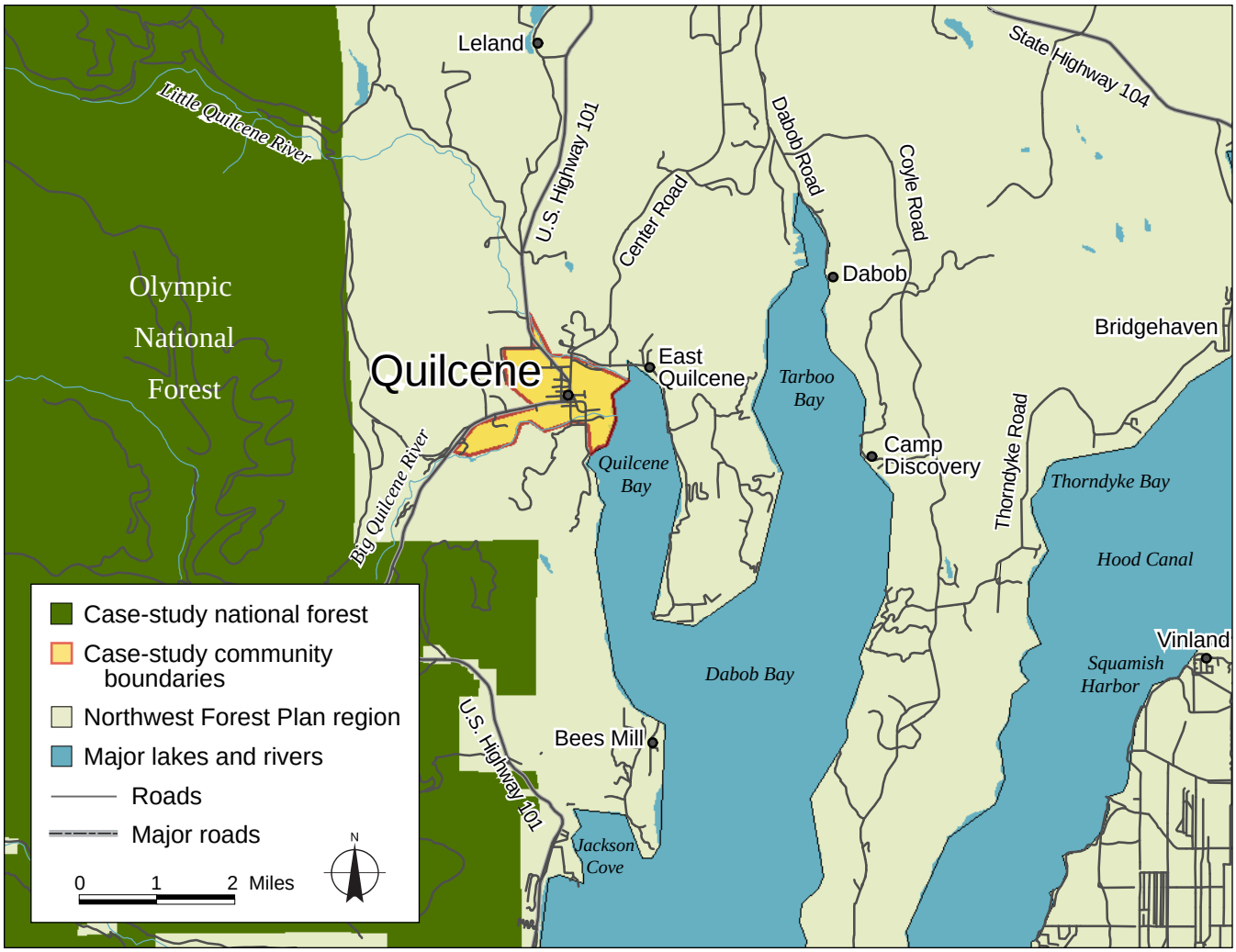

Figure 2—Quilcene case-study community boundaries.

For the purposes of this study, census BGAs data were used to describe Quilcene. Block Group Aggregation 6307 includes the downtown commercial core, marine industrial areas along Hood Canal, and residential areas in proximity to downtown Quilcene. The BGA 6307 closely approximates the village of Quilcene boundaries established for planning purposes by the Jefferson County Planning Department and reflects a narrow definition of the community. Depending on their affiliations or occupations, area residents variously think of Quilcene as business core, fire district, postal code, or school district boundaries. Fire district, school district, and ZIP code boundaries are more expansive and include portions of BGAs 6308 and 6304. Census information for BGAs 6304 and 6308 is not included in this report. However, this case-study report draws its information from and describes a community that encompasses this broader area of roughly 84 square miles that is sparsely populated. The broader area, as defined by ZIP code 98376, was populated by 1,644 at the time of the 1990 census and increased to 1,767 in 2000. The area that is BGA 6308—East Quilcene, Dabob, Camp Discovery, Coyle—includes the people—about 400 in 1996—on the Bolton (Coyle) and Dabob Peninsulas. The area's small but growing population has, for the most part, little relationship with the study area. The BGA 6304, Leland (population about 800), is north and northwest of the downtown area. Leland consists of old homesteads in pasturelands adjacent to forest lands. Historically, there was a close social and

economic relationship between the Leland population and Quilcene.

Quilcene was initially settled in the 1860s and by 1880 had a population of about 65 (Jefferson County Historical Society). It received considerable investment in the late 1880s when railroad enthusiasts and Port Townsend boosters speculated on the transcontinental railway running up the Olympic Peninsula and terminating at Port Townsend. Investments were made, but the rail was never developed. Nevertheless, Quilcene remained firmly rooted. Located along Hood Canal, it has maintained a marine orientation since its early days and still has an active shellfish industry. The area is particularly renowned for its rich oyster beds, established in the 1930s. Quilcene is adjacent to forest lands to the west, nearly all within the Olympic National Forest and Olympic National Park. The local economy has relied on forest resources, with a longstanding orientation toward logging since the 1920s. Additionally, lush pastures in small valleys north of Quilcene once sustained a number of agricultural enterprises.

Quilcene's commercial center has long served as a goods and service hub for the Hood Canal region of the Olympic Peninsula, serving the largely dispersed population of a broad geographic area, including the community of Brinnon to the south. Hadlock, a town north of State Route 104, 15 miles from Quilcene, now serves as the local commercial center for the southern portion of the county. A larger grocery store, hardware store, and other retail and professional services are located in Hadlock.

By all accounts, Quilcene was a traditional timber town. Most male residents worked at least part of the year in logging. The downtown core comprised small business such as restaurants, grocery stores, and gas and service stations. The community also served as the headquarters for the Forest Service's Quilcene Ranger District (now the Hood Canal Ranger District), and a number of residents worked for the Forest Service. Although there are state and private lands in proximity to Quilcene, the main source of employment was working for one of several local timber contractors who bought or logged sales on the Olympic National Forest.

Given its central role in the economy, the Forest Service was a predominant force in the community, providing timber sales, contracts, and receipts to support the local economy. One resident noted that in the 1950s, one local logging company employed over 100 men and the work was almost entirely on the Olympic National Forest. As late as the early 1990s there were two logging companies, Peterson/Bellingham Logging and Hanley and Philips Logging. These companies provided seasonal employment to local residents, logging primarily Forest Service timber.

Lake Quinault Area

The Lake Quinault area includes the communities of Quinault, Neilton, and Amanda Park in the southwestern portion of the Olympic Peninsula (fig. 3). The three communities are approximately 40 miles north of Hoquiam, along the western loop of Highway 101, and about 30 miles east of the Pacific coast, in Grays Harbor County, Washington. Referred to as the Quinault Rain Forest, the area receives an average of about 140 inches of rain a year. Adding to the scenic beauty of the area is Lake Quinault, a natural lake created by glacial runoff from the Olympic Mountains. The town of Quinault is located on the south shore of Lake Quinault; Neilton is located approximately 5 miles south of the lake along Highway 101; and Amanda Park is located along the northwest end of the lake. Amanda Park lies within the boundaries of the Quinault Indian Reservation, although it is considered a nontribal community. All three communities are unincorporated, and are within 10 miles of one another, sharing services and resources. For example, the school (kindergarten through 12th grade) is located in Amanda Park, whereas the health clinic is in Neilton. Residents consider Quinault, Neilton, and Amanda Park to be part of one "community."

Census data, collected at the level of census BGAs, were used to measure changes in socioeconomic condition between 1990 and 2000. For this study, the BGA is defined as Quinault-Neilton-Weatherwax (6109), which includes the communities of Quinault and Neilton. Amanda Park, however, is located within the Quinault Indian Reservation (BGA 6101). Although it is possible to break the BGA down

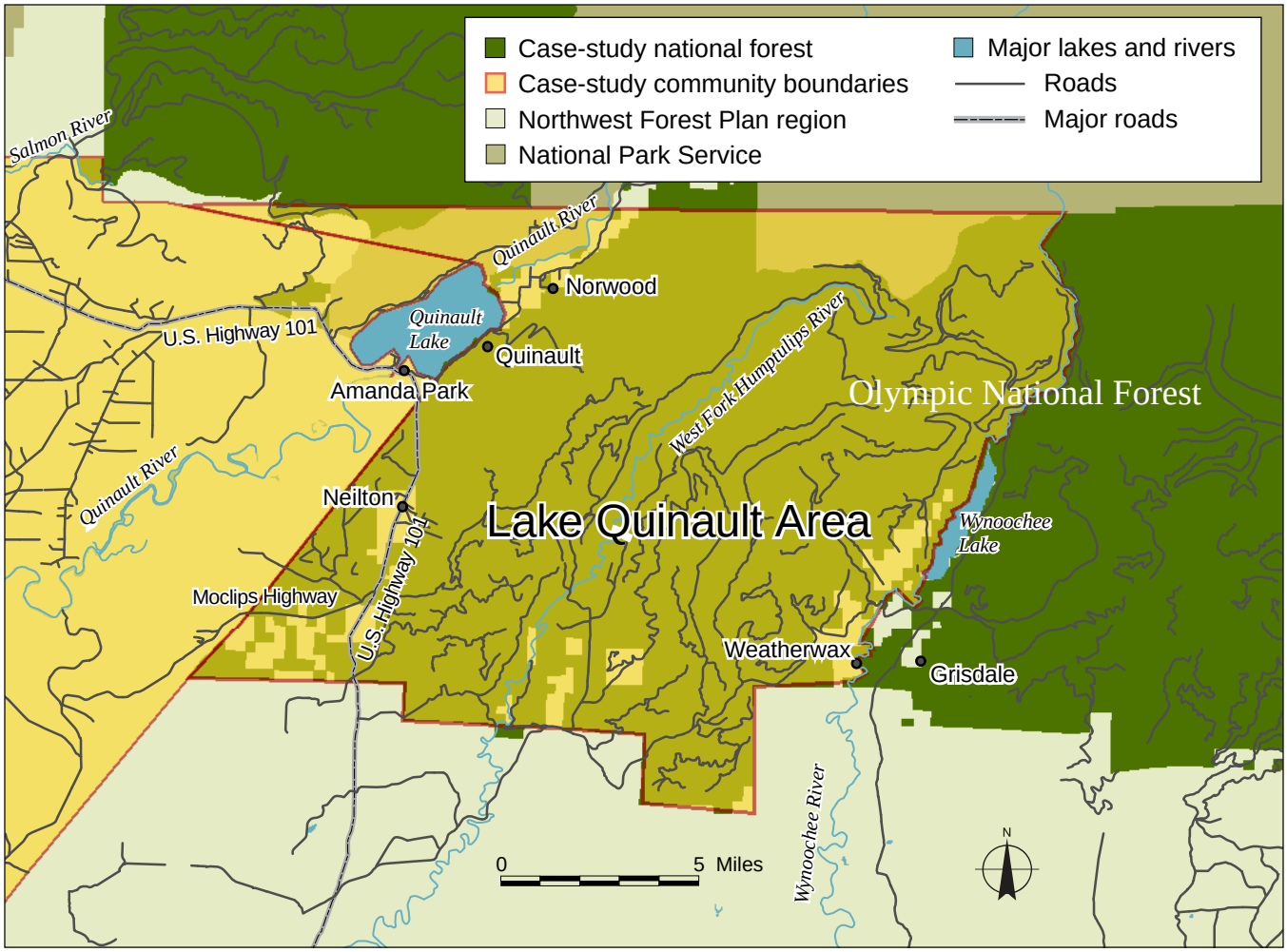

Figure 3—Lake Quinault case-study community boundaries.

into individual block groups and look only at the Amanda Park block group, the boundaries of this block group were changed between 1990 and 2000, making comparisons between years difficult at this level. Thus, for the purposes of this case study, qualitative data from interviews include changes that have taken place in the area as a whole (including Amanda Park), whereas quantitative census statistics will only include the communities of Quinault and Neilton (BGA 6109).

The three communities abut the southwestern portion of the Olympic National Forest. Quinault is surrounded by the national forest to the south, east, and west, and is bounded by Lake Quinault to the north (which is under the jurisdiction of the Quinault Indian Nation). The Quinault Ranger Station, which is now part of the Pacific Ranger District, is located at Quinault. The Olympic National Forest surrounds Neilton on all sides. Amanda Park, as mentioned previously, lies within the boundaries of the Quinault Indian Reservation, and borders the Olympic National Park to the north. The north shore of Lake Quinault and the adjoining uplands are part of the Olympic National Park. Other major landowners in the area include the Quinault Indian Nation, which owns or manages lands downstream of Lake Quinault; the Washington Department of Natural Resources, which also manages timberlands; and private industrial timberland owners, such as Rayonier, Weyerhaeuser, and Merrill-Ring.

Prior to Euro-American settlement, the area was historically part of the territory of the Quinault and Queets Indians. Although today the population is predominantly Caucasian, the Native American presence is still evident in the area, owing to the proximity of the Quinault Indian Reservation. The Quinault Tribe manages a fish hatchery on the lake, and some tribe members live and work in the communities. Also, students from Queets, one of the two tribal villages on the Quinault Reservation, attend middle and high school at Lake Quinault School.

Anglo settlement of the area began in the late 1880s and 1890s. The early pioneers were homesteaders who cleared the forest to establish farms and raise cattle. Others were attracted to the area in search of gold and other minerals. The Quinault town site was cleared in the 1890s. A farm site was settled in Neilton in the 1860s but was destroyed by fire in 1885. E.E. Fishel, the first Forest Service Ranger at Quinault, eventually settled the Neilton area in 1910 (Righter 1978).

As timber became a more important commodity in the early 1900s, a new group of settlers arrived in the Lake Quinault area to establish timber claims. The timber industry subsequently became an important part of the local economy. Small mills were established in the area as early as 1914 (Righter 1978). As the timber industry became more consolidated, with larger companies purchasing land or Forest Service timber sales, railway lines were established to ship logs to Hoquiam. Logging in the area increased after World War II, as the national demand for housing increased. Timber harvest data available between 1965 and 2001 show that of the four counties on the Olympic Peninsula, Grays Harbor County harvested the greatest amount of timber, with an average of about 600 million board feet per year (mmbf) for all timberlands, and a peak of 981 mmbf in 1988. Between 1965 and 2001, the majority of timber harvested came from private lands (an average of 427 mmbf), with an average of approximately 80 mmbf coming from tribal lands (i.e., the Quinault Indian Reservation), 23 mmbf from state, and 50 mmbf from federal lands. At one time, the Port of Grays Harbor was the largest timber exporting port on the Pacific coast. The average harvest from federal land was 72 mmbf until 1989, after which the average declined to 5 mmbf. A Congressional agreement signed with Grays Harbor County created the Grays Harbor Sustained Yield Unit, which specified that 50 percent of the timber harvested from the Quinault District be processed within the county. The federal timber supplied logs to both the small local mills in the Quinault area, as well as the large mills in Aberdeen and Hoquiam. During the 1970s and 1980s, cedar shake mills, in addition to small sawmills, sprung up along Highway 101, many of which were highly dependent on Forest Service timber. Thus, up until the late 1980s, the timber industry served as a key source of jobs for residents of the Lake Quinault area.

Although timber fueled the economic engine of the community, tourism has always been important to the area. Some early pioneer families became involved in guide services, as well as the development of lodges, inns, and chalets in and around the lake. In 1890, Alfred Higley, one of the first Anglo settlers to the area, opened the Quinault Lodge (Righter 1978). Although he closed it a year later, a new lodge was built in 1903. This lodge burned in 1923, but was rebuilt in 1924, and continues to operate today, attracting tourists from around the world. A chalet, built by the pioneer Olson family, was constructed in the 1920s along the east drainage of the Quinault River at Enchanted Valley, which is now part of Olympic National Park.

The lives of the Lake Quinault residents have continuously been intertwined with the USDA Forest Service almost since the area was first settled. In 1897, the Olympic Forest Reserve was created, and the forest was surveyed, cruised, and mapped between 1898 and 1900 (Rooney 1997). In 1909, the Forest Service took over the Quinault town site and temporarily used the Quinault Lodge as its district headquarters (Righter 1978). Between 1910 and 1911, the Forest Service surveyed the Quinault town site and established summer lots. By 1916, a ranger station was established and served as the district headquarters for the Quinault Ranger District until 1998, when the district was consolidated into the Pacific District. The Quinault Ranger District covered about 130,000 acres in the southwest portion of the Olympic National Forest. Half of the district was located to the north of Lake Quinault, and another portion to the south of the lake, and included the south shore of

Lake Quinault. In 1998, the Quinault Ranger District was consolidated with the Sol Duc Ranger District to become the Pacific Ranger District, and the main headquarters moved to Forks. Although the Quinault office remains open, the staff has been reduced. The district ranger shares his time between Forks and Quinault, but is primarily at Forks.

The Quinault Indian Nation

The Quinault Indian Nation is the sovereign nation of the Quinault people, and six other tribes (Queets, Quileute, Hoh, Chehalis, Cowlitz, and Chinook) that were relocated to the reservation in mid and late 1800s. Tribal enrollment is currently about 3,000 members, with half of the population living on the Quinault Indian Reservation. Many of those living off of the reservation reside in the Aberdeen/Hoquiam area, about 45 miles south of the reservation. The reservation covers 208,150 acres of land, and is the third largest Indian reservation in the state of Washington (fig. 4).

Most residents living on the Quinault Indian Reservation reside in the Indian villages of Taholah and Queets, with a smaller segment of the population residing in the nontribal community of Amanda Park. Taholah is a coastal fishing community located at the mouth of the Quinault River. Located at the terminus of a remote section of State Route 109 in Grays Harbor County, with a population of about 871, Taholah is home to most of the Quinault tribe members, and all government and administrative offices are there. The village of Queets is on the northern part

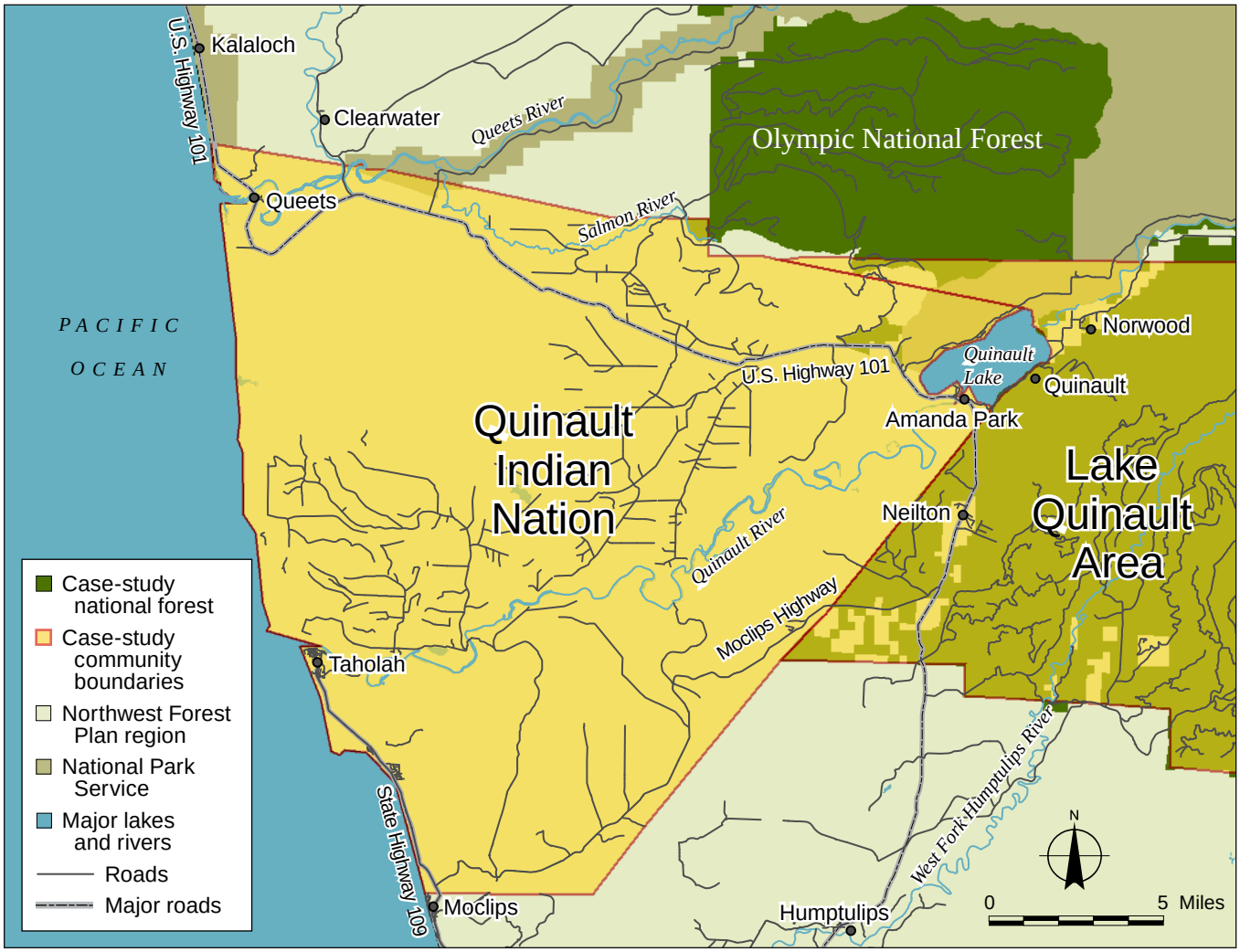

Figure 4— Quinault Indian Nation case-study community boundaries.

of the reservation off of Highway 101 at the mouth of the Queets River, a few miles inland from the Pacific Ocean. Queets falls just within the boundary of Jefferson County, and has a population of about 149 residents. Although Queets is only about 15 miles north of Taholah "as the crow flies," no direct route exists between the two communities. Instead, from Taholah one must travel inland 45 miles to Lake Quinault and continue northwest along highway 101 for another 30 miles to Queets. Consequently, Queets has been fairly isolated from much of the employment opportunities and tribal activities taking place in Taholah. Amanda Park is located inland at the eastern boundary of the reservation, along Highway 101 on the western shore of Lake Quinault.

For this study, we focused primarily on the communities of Taholah and Queets, as the majority of tribe members reside in these communities. Although some tribe members reside in Amanda Park, the community identifies itself more closely with the Quinault-Neilton communities. Qualitative information for Amanda Park is thus presented with the Lake Quinault Area data. Because BGAs were used to measure changes in socioeconomic condition between 1990 and 2000, data from the entire reservation (including Amanda Park) were combined. We attempted to disaggregate the data into individual block groups; however, the block group boundaries changed between 1990 and 2000, making comparisons difficult. Thus, for this study, census statistics represent the entire BGA, defined as Taholah census designated place (CDP)-Quinault Indian Reservation (BGA 6101).

The Quinault Indian Reservation is west of the southwestern portion of the Olympic National Forest. The Quinault Indian Nation shares many of its watersheds with the Olympic National Forest and the Olympic National Park, with the headwaters located within the park or forest, and the lower portions of the watersheds located within the reservation. The Quinault Indian Nation also owns Lake Quinault, and manages a fish hatchery on the lake.

The Quinault people have resided along the Quinault River for thousands of years. They lived in permanent villages along the river and also in temporary settlements across large portions of the southwestern Olympic Peninsula. Livelihoods were based on fishing (primarily salmon and steelhead), hunting, and gathering. Elaborate trade networks were established between the Quinaults and other peninsula tribes, primarily by canoe travel, but also over land.

The Quinault's first contact with non-Indians was in the late 1700s, when Spanish explorers arrived in the area. Contact with non-Indians increased through the early and mid-1800s as more Anglo explorers, traders, and settlers came to the area. In 1853, the Washington Territory was created. To secure land for Anglo settlement and restrict Indian claims to land, Governor Isaac Stevens began to negotiate treaties with the Washington tribes. Many of the tribes, whose populations had been decimated by smallpox, measles, and influenza introduced by Anglo traders, reluctantly signed these treaties in an effort to secure access to their primary villages or ancestral rivers. In addition to having a reservation homeland, the U.S. government promised to provide education, medical care, and maintain the right for tribes to hunt, fish, and gather in their usual and accustomed areas (i.e., ancestral territories). In 1855, the Quinaults, along with the Queets, Quileutes, and Hohs, signed the Quinault River Treaty, which relinquished all claims to the tribes' vast ancestral lands in exchange for land on a reservation. Stevens selected the area around the Quinault River as an appropriate place for a reservation, owing to the dense forests that made it unsuitable for farming by Anglo settlers. Although the Quinaults were content to maintain access to their native river, other tribes were forced to move away from their ancestral lands to the Quinault Reservation. In 1873, the Quinault Reservation was enlarged to include members of other tribes that never signed treaties.

The U.S. government used a number of strategies to try to assimilate Indians into Euro-American culture and society. Early attempts were through religious proselytizing, compulsory education for children at boarding schools operated by the USDI Bureau of Indian Affairs (BIA), and privatization of land. This last approach was an effort to convert Indians into farmers, and was initiated in 1887,

when Congress passed the General Allotment Act (or the Dawes Act),[2] which divided reservation land into private allotments for farming. The Quinault Reservation was divided into over 2,300 80-acre private allotments (Stocks 2003). Most of the land, however, was heavily forested and unsuitable for farming.

Although the Quinaults were never converted to farmers, the privatization of their reservation resulted in loss of the majority of their land to non-Indians. Individual Indian families, unable to make a living on their 80-acre allotment, were often forced to sell their land. As the market for timber increased in the late 1800s and early 1900s, the value of the forested land of the Quinault Reservation increased, attracting large timber companies. In 1922, the Aloha Corporation began railroad logging on the Quinault Reservation, initiating a pattern of large-scale logging that would last for the next 50 years. The BIA, which managed the land in "trust" for individual Indian families, established long-term contracts (or "block sales") with a few logging companies. Stocks (2003) described the logging practices between the early 1950s to mid-1970s: "Whole watersheds were logged off, streams jammed, and landowners received poor prices for their trees." It was not until 1971, following protests and roadblocks by Quinault tribe members, that these practices received public attention (Stocks 2003).

The division of the reservation into private allotments left a legacy of fragmented land ownership that continues to create land management and jurisdictional problems for the tribe. Today, land ownership consists of a checkerboard pattern of trust, fee, and tribal land. Trust land is land owned by individual Indian families and held in trust by the BIA; fee land is privately owned by non-Indians; and tribal land is owned by the Quinault Indian Nation. In 1980, the Quinault Indian Nation owned only 2 percent of the land on the reservation. Through an aggressive land acquisition program, the tribe now owns 65,000 acres (31 percent of all Quinault Indian Reservation lands), with 70,000 acres of trust land and 73,150 acres of fee lands. Because the trust lands cannot be divided, many are owned by multiple generations of families (one source reported that in some cases, 250 people own a parcel jointly). Large timber companies, such as Rayonier, and Anderson and Middleton, own a large proportion of the fee lands (Stocks 2003).

Development of a more autonomous tribal governance structure began in 1934, with the passage of the Indian Reorganization Act, which established federally recognized tribal governments. The Quinault had already established its bylaws in 1922. However, more restrictive policies during the 1950s and early 1960s delayed any further movement toward a self-governing structure until the late 1960s. In 1975, the tribe approved its constitution, following the Indian Self-Determination and Education Assistance Act, which called for maximum Indian participation in setting the direction of federal services to Indian communities. The tribe began to develop programs and provide services to tribe members, such as subsidized housing, which offered affordable housing and encouraged people to move back to the reservation. In 1988, the U.S. government initiated a demonstration project for tribal self-rule. In 1990, the Quinault Indian Nation was one of seven tribes in the United States to participate in a demonstration project in which the tribe governed its own operations. Based on the success of these demonstration projects, Congress passed the Tribal Self-Governance Act[3] in 1993. Federal appropriations could then be passed directly to tribes (rather than through the BIA and Indian Health Services), and tribal governments expanded. Currently, the Quinault Indian Nation administers five departments: Administrative

[2] The General Allotment Act of 1887 (referred to as the Dawes Act) privatized reservation land, which was held in common by tribe members. Land allotments were granted to individuals and families ranging from 30 to 120 acres. "Surplus" land not allotted or otherwise reserved for the tribe was sold to the government and made available for homesteading. The result of the Dawes Act and the "Allotment Era" was the loss of 64 percent of tribally owned land between 1887 and 1933. Although originally the Dawes Act claimed to protect Indian property rights during the land rushes of the 1890s, in reality, the goal, according to the BIA (2000), was to "break up the tribal mass,' abolish tribal governments, and assimilate the Indians into the larger society."

[3] The Tribal Self-Governance Act of 1993 amended the Indian Self-Determination and Education Assistance Act. It established a program of self-governance within the U.S. Department of the Interior, directing the Secretary of the Interior to enter into annual funding agreements with each participating tribe, and authorized appropriations.

Services, Natural Resources, Social Health and Educational Services, Community Services, and a health clinic.

Prior to the late 1980s, there was little interaction between the Quinault Indian Nation and Olympic National Forest at an administrative level. The Olympic National Forest, however, did serve as a source of jobs for tribe members. For example, tribe members who were loggers harvested timber from the Olympic National Forest, and many worked as seasonal employees on fire crews.

Following the passage of the Self-Governance Act and the Self-Determination Act, the sovereign nation status of tribes became more widely recognized and acknowledged. As the tribe took greater control over managing its own land and resources, it began to take legal action against past injustices. One case was with the reservation boundary, which was incorrectly surveyed when the reservation was originally delineated in the 1800s. To compensate for the surveying error, the U.S. government transferred approximately 11,000 acres from the Olympic National Forest to the Quinault Indian Nation in 1988–89. The transferred area is called the North Boundary Expansion Area (referred from now on as the "North Boundary"). Because some of the land included in the surveying error had become part of the Olympic National Park or was private land, it could not be returned to the tribe. This led to the establishment of the Quinault Special Management Area (or Section 2 lands) under Public Law (PL) 100-638. This is an area of 5,260 acres on the Olympic National Forest southeast of the reservation for which allocation of 45 percent of all revenues to the tribe is specified.

The Quinault's relatively large land base and location have enabled many tribe members to continue to base much of their livelihoods on natural resources. The forests, rivers, and ocean continue to provide the tribe with the resources to meet their subsistence, cultural, and economic needs. Interviewees mentioned that although they may have grown up "poor" from an income standpoint, they always had plenty of food owing to the availability of seafood, wild game, and locally harvested plants.

Fishing, particularly salmon and steelhead, has always been important to the culture and economy of the Quinault Indians. The ability of tribe members to engage in traditional livelihoods was enhanced in the 1970s with the Boldt Decision,[4] which reaffirmed treaty fishing rights for Washington tribes. Tribe members began to commercially fish off-reservation. Many fishers expanded their efforts to include the ocean fisheries for salmon, halibut, tuna, and Dungeness crab. The Quinault Indian Nation constructed a fish processing plant in Taholah and established the Quinault Pride Seafood Enterprise. The Quinault Pride Seafood Enterprise purchases fish from tribe members to sell on the open market. The fish processing plant has a smokehouse and cannery, producing smoked salmon, clams, and other processed seafood. In fiscal year 2001–2002, the enterprise purchased over 2.75 million pounds of fish and shellfish from tribe members, which included salmon, steelhead, sturgeon, halibut, cod, crab, and clams. Quinault Pride Seafood employs approximately 20 full-time and 20 seasonal workers. The number of tribe members employed in commercial fishing includes 135 river fishers, 150 to 200 razor clam diggers, and about 84 ocean fishers (or 24 ocean fishing vessels) (Stocks 2003). The Quinault Indian Nation is one of two self-regulating tribes in Washington for fisheries management, with its own hatcheries located on the Quinault and Queets Rivers, and at Lake Quinault.

In addition to fishing, the timber industry has served as the economic backbone of the region for the past 100 years. Although most revenues from logging in the area went to non-Indians, many Quinault tribe members worked in the timber industry as loggers and mill workers. One interviewee stated that in Queets, all men worked as

[4] As part of the original treaties signed in Washington in the 1850s, tribes were reserved the right to fish "at all usual and accustomed grounds and stations in common with the citizens of the territory." Over time, however, the state limited Indian fisheries to subsistence fishing only on rivers that passed through reservation lands. In the 1970s, U.S. District Court Judge George Boldt reaffirmed treaty fishing rights and established tribes as co-managers of the fisheries resource. The Boldt Decision entitled the tribes to harvest 50 percent of the salmon on all usual and accustomed fishing grounds. In 1996–97 the Boldt decision was expanded to include shrimp, crab, and groundfish.

loggers at one time. Many were "gyppo" (or independent) loggers who did contract work for the Forest Service or private companies. With the decline in the regional timber industry, many Quinault members were forced to shift to other types of work. Some of those who have remained in the business have been able to become owners and operators of timber companies and mills. There are currently two logging companies owned by Quinault tribe members. Because much of the work is mechanized, they employ very few people. Much of the work requiring manual labor, such as precommercial thinning, is now subcontracted out to Hispanic crews. There are also three cedar shake mills currently owned by tribe members in Amanda Park, and a few other shake mills that institute tribal preference when hiring. During much of the heavy logging in the early part of the 20th century, cedar was not a valued species and was left on the ground following a harvest. Today, most of the cedar that feeds the shake mills is salvaged from trees that have been buried. The Quinault Indian Nation has an active cedar salvage program, and supplies much of the cedar for the local shake mills.

Timber has also become an important source of revenue for the tribe, particularly with regard to efforts to buy back reservation land for the Quinault Indian Nation. Of the 208,150 acres of reservation land, about 165,000 acres (or 80 percent) is suitable for commercial timber production. In 1988, the Quinault Indian Nation created Quinault Land and Timber Enterprises (QLT) as a timber and land acquisition program. The QLT purchases timber from willing sellers of trust and fee lands on the reservation, and subcontracts with logging companies to log the land. The QLT then finds mills that will purchase the timber. Revenues generated from the sale of timber are then used to purchase property for the Quinault Indian Nation. The ultimate goal is to purchase as much land on the reservation as possible so that the tribe can properly administer and manage its natural resources.

Nontimber forest products (NTFPs), also known as special forest products or minor forest products, constitute another important resource for the Quinault people, in terms of their commercial, medicinal, and cultural value. Species such as western redcedar, used for making canoes, and beargrass (*Xerophyllum tenax* (Pursh) Nutt.), used in basket weaving, are particularly important both culturally and economically. Other important species include licorice-fern (*Polypodium glycyrrhiza* D.C. Eat.), sword-fern (*Polystichum* spp.), Pacific yew (*Taxus brevifolia* Nutt.), white pine (*Pinus monticola* Dougl. ex D. Don), hemlock, Douglas-fir, cottonwood (*Populus* L.), Oregon grape (*Berberis* spp. L.), wild cherry [bitter cherry] (*Prunus emarginata* (Dougl. ex Hook.) D. Dietr.), bigleaf maple (*Acer macrophyllum* Pursh), salal (*Gaultheria shallon* Pursh), and huckleberry (*Vaccinium* spp.) (Quinault Indian Nation 1993). Tribe members are allowed to harvest NTFPs from the reservation for personal use, and may harvest for commercial use by obtaining a permit. A few timber contractors also have contracts that allow them to harvest NTFPs for commercial purposes. Beargrass, salal, and sword-fern are especially important products for the floral greens industry. In the mid-1990s, the Quinault Indian Nation attempted to develop a tribal agroforestry enterprise, including the processing and sale of NTFPs, but was unsuccessful. The Quinault Indian Nation is continuing to look for opportunities to better market NTFPs from the reservation.

Finally, hunting for big game species for food, such as elk and deer, continues to be an important activity for many tribe members.

Chapter 2: Trends in Socioeconomic Benefits From the Olympic National Forest, 1990–2002, and the Impact of the Northwest Forest Plan

The Olympic National Forest

The Olympic National Forest covers approximately 632,000 acres on the Olympic Peninsula, in northwestern Washington. The forest is divided into two ranger districts: the Hood Canal, which covers the eastern half of the forest; and the Pacific, which covers the western half. The Hood Canal District Office is located in the town of Quilcene, with a smaller office located at Hoodsport. The Pacific District Office is located at Forks, with a smaller office located at Lake Quinault. The forest headquarters/Supervisor's Office is in Olympia, Washington, the state capital.

The forests on the Olympic National Forest at the time the Northwest Forest Plan (the Plan) was initiated consisted of a mixture of plantation forests, clearcut areas, and natural forests ranging from early- to late-successional (i.e., greater than 80 years old) stands (FEMAT 1993). Prior to 1990, the Olympic National Forest operated under a collection of unit management plans focused heavily on timber production. The forest's timber harvesting approach focused primarily on regeneration harvest to maximize timber production. This approach included the application of precommercial thinning treatments to enhance tree growth and prevent early stagnation.[5] The forest had a long-term agreement with Simpson Timber Company, under the Sustained Yield Management Act (Public Law [PL] 273) of 1944, to jointly manage the southeastern portion of the forest, designated as the Shelton Cooperative Sustained Yield Unit. The unit included 111,000 acres of national forest and 250,000 acres of Simpson's private holdings to be managed jointly on a "sustained yield" basis for 100 years. The agreement enabled Simpson to log 135 million board feet (mmbf) per year from the unit. Much of the national forest portion of the Shelton Cooperative Sustained Yield Unit was clearcut between 1960 and 1985 (FEMAT 1993). Simpson ceased logging on the national forest in 1985, and the agreement was formally terminated in 2004.

In 1990, the Olympic National Forest completed a comprehensive management plan (Olympic Land and Resource Management Plan or Olympic forest plan). A primary emphasis for developing the forest plan was to consolidate the existing unit plans and integrate new management priorities to protect sensitive species, such as the spotted owl. The Plan set an allowable sale quantity (ASQ)[6] for timber of 110 mmbf per year, down from the average of 250 mmbf harvested per year in the 1980s.

The Plan, launched in 1994, functioned as an amendment to the Olympic forest plan, overlaying its land use allocations and standards upon those developed in the Olympic forest plan. In most cases, the Plan standards were more restrictive than the Olympic forest plan. For example, the probable sale quantity (PSQ)[7] of timber was reduced to 10 mmbf per year (a drop of more than 90 percent). The Olympic forest plan continues to serve as the foundation for management direction regarding issues not covered by the Plan, such as the location of recreation areas and municipal water systems. The most significant change made under

[5] U.S. Department of Agriculture, Forest Service, Olympic National Forest. 2000. Forest Plan Monitoring Report. Fiscal years 1997–2000. Unpublished document. On file with: Olympic National Forest, 1835 Black Lake Blvd. SW, Olympia, WA 98512-5623.

[6] The term "allowable sale quantity" or ASQ was first introduced under the National Forest Management Act (1976) and the Federal Land Policy and Management Act (1976) to define the first decade of sustainable harvest, and was based on all lands on a given forest that are suitable and designated for timber production as defined by the individual forest's management plan. It is the maximum volume of timber that can be harvested from a given national forest or Bureau of Land Management (BLM) district, and is the presumed level that can be sustained in perpetuity given the timber attributes of a forest. By the 1980s, new information on the habitat requirements of the northern spotted owl (*Strix occidentalis caurina*) forced the agencies to redefine their assumptions about sustainable harvest levels, resulting in a decrease in the ASQ of many forests (Tuchmann et al. 1996).

[7] The PSQ was the term developed under the Plan as an alternative to the ASQ that reflects the uncertainty in the amount of harvest that can be sustained. The PSQ is based on lands that are only suitable for timber production. Under the Plan, timber-suitable lands are only those designated as matrix or adaptive management areas. Although harvest activities, such as commercial thinning for habitat improvement, may occur on other types of lands (e.g., late-successional reserves), timber removed from these lands are not included in the PSQ calculation (Tuchmann et al. 1996).

both the Olympic forest plan and the Plan was to shift land management priorities away from timber extraction to protection of endangered species via protection of aquatic systems, watershed restoration, development of late-successional/old growth[8] forest habitat, and road system management (see footnote 5).

One significant component of the Plan was the designation of land into specific land use types. These land allocations included the following: congressionally reserved areas, late-successional reserves (LSRs), adaptive management areas, (AMAs) administratively withdrawn areas, riparian reserves, and matrix.[9] Scheduled timber harvests (i.e., harvests contributing to PSQ) are allowed only in AMAs and matrix lands. Salvage harvest is allowed in LSRs under a limited set of conditions, and thinning in LSRs to promote the development of late-successional characteristics in stands less than 80 years old is also permitted. Thinning within riparian reserves is also allowed if it supports the attainment of the Aquatic Conservation Strategy objectives.

The Olympic National Forest has no matrix lands (the Plan allocation in which the bulk of timber harvest is expected to occur). Matrix lands were not assigned to the forest because of the highly fragmented status of late-successional and old-growth forests on the Olympic Peninsula.[10] The rapidly growing urban population in the Puget Sound area further separated and isolated the northern spotted owl populations found on the Olympic Peninsula from populations in the Cascades. As a result, a high priority was placed on protecting what remained of owl habitat on the Olympic National Forest under the Plan. The need to maintain late-successional habitat for marbled murrelet (*Brachyramphus marmoratus*) was also a key factor in the development of the land allocations on the Olympic National Forest.[11]

About 66 percent of the forest is in LSRs (420,000 acres), about 20 percent is in AMAs (125,000 acres), and the remaining 14 percent (90,000 acres) is congressionally reserved areas (i.e., wilderness and the Quinault Research Natural Area). Of the 125,000 acres of AMA lands, only about 51,000 acres are available for timber harvesting to meet the average annual PSQ of 10 mmbf. The remaining acreage is designated as riparian reserves (65,000 acres), forest plan administrative withdrawals (2,000 acres), and areas unsuitable for timber harvests (7,000 acres) (USDA FS 2004). About 50 percent of the total volume of timber offered on the forest since implementation of the Plan has been on nonriparian AMA lands.

Within the LSRs, about 14 percent of the land was administratively withdrawn under the Olympic forest plan and cannot be harvested. Silvicultural treatments on the remaining 357,000 acres are restricted to commercial and precommercial thinning on stands less than 80 years old for the purpose of promoting late-successional and old-growth stand structure. About half the timber offered from the forest has been on LSR and riparian reserve lands. Wood removed through commercial thinning on these lands contributes to volume offered, but it is not part of the PSQ calculation. The forest's performance, however, is evaluated by the total timber volume offered (including harvests on LSR lands), and not just the volume that contributes to PSQ.

Resource and Recreation Outputs

One of the socioeconomic goals of the Plan was to produce a predictable and sustainable supply of timber and nontimber forest products, and recreation opportunities on federal forest lands within the plan area. Consistent with this goal, one of the monitoring questions posed in the Northwest Forest Plan record of decision (ROD) was, "Are predictable levels of timber and non-timber resources available and

[8] "Old-growth" forests, as defined by the Forest Ecosystem Management Assessment Team (FEMAT), are the mature, diverse final stage of late-successional forests, characterized by a significant number of large, dominant trees; the presence of standing dead or downed trees; and multiple canopy layers. Late-successional forests are those with trees at least 80 years old. Old-growth forests are defined as trees that are at least 200 years old (Tuchmann et al. 1996).

[9] See USDA and USDI 1994 for a detailed description of each land use type.

[10] Much of the Olympic Peninsula, including the Olympic National Forest as well as private, state, and Indian reservation lands, has been clearcut over the past 80 years (FEMAT 1993).

[11] Additional vertebrate species associated with late-successional/old-growth forests found on the Peninsula include goshawks (*Accipiter gentiles*), and American marten (*Martes americana*) (FEMAT 1993).

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 or commercial fishing. The following sections examine whether predictable levels of timber and nontimber resources and recreation opportunities have been produced on the Olympic National Forest since 1990, the baseline for this monitoring program.

Timber

Overview—

The timber program on the Olympic National Forest currently consists of commercial thinning on LSR and AMA lands.

Trends—

Timber harvest levels have dramatically decreased since implementation of the Plan (fig. 5). Prior to the spotted owl injunctions (i.e., between 1978 and 1989), harvest levels ranged from about 200 to 300 mmbf, with most of the harvest involving regeneration harvest (i.e., clearcutting) of old-growth timber. Under the Olympic Forest Plan, initiated in 1990, the ASQ dropped to 110 mmbf, but actual harvest volumes continued to decline below this level. Under the Plan, the PSQ was set to 10 mmbf per year, whereas actual volume harvested has fluctuated between 2 and 20 mmbf per year.

Changes to the program—

Although the acreage available for timber harvests is limited, the Olympic National Forest has been relatively successful compared to other forests in meeting its PSQ. One key factor that has contributed to this success is the lack of litigation and the small number of appeals. Because of the forest staff's emphasis on the commercial thinning of young stands, rather than regeneration harvesting, there has been very little litigation by environmental groups. This allows timber sales on the forest to flow smoothly compared to other forests where litigation has stalled sales and led to administrative gridlock. This is largely a result of the lack of matrix land on the Olympic National Forest, combined with strong efforts made by Forest Service staff to work closely with environmental groups.

Despite the relative success at achieving the forest's average annual PSQ in the majority of years, the staff believes a more extensive program is desirable. Specifically, managers believe the forest could sustain a commercial thinning harvest volume of roughly 20 mmbf. In addition, a precommercial thinning program of about 3,000 acres per year is desirable by forest managers to attain both late-successional characteristics and maximize the economic benefits of future commercial thinning activities. Factors that have limited the forest's ability to reach these levels of management include the following:

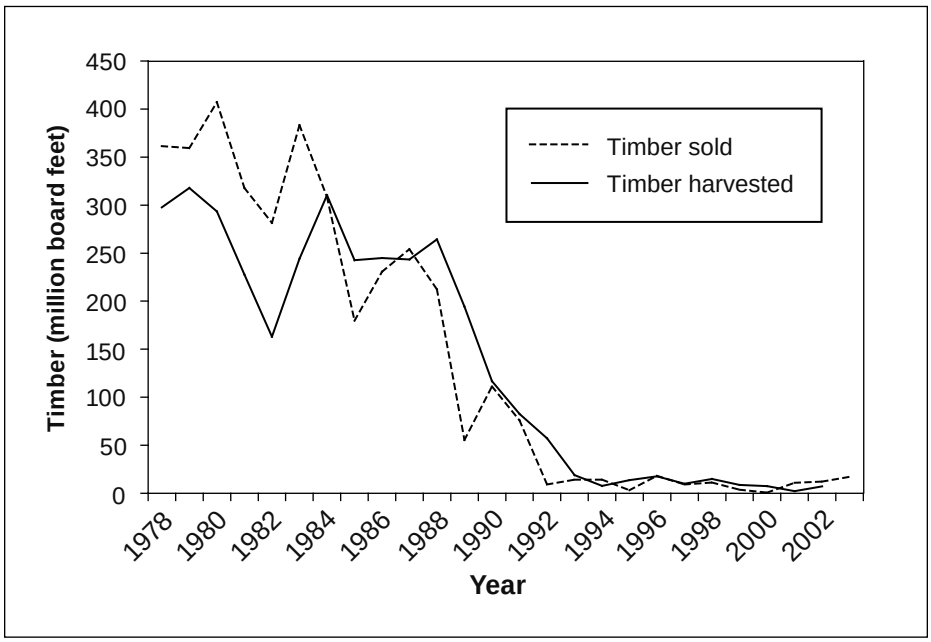

Figure 5—Timber harvested and sold on the Olympic National Forest, 1978–2002. (Source: USDA FS 2004).

- **Insufficient funding and staffing**. Forest budget and staffing levels have declined dramatically since the mid-1980s, particularly within the forest's timber program. Despite the decline in workforce, the workload has increased for employees owing to the increased complexity of work associated with implementing the Plan (see footnote 5). Although the forest's thinning program has been very aggressive, many precommercial- and commercial-age stands have gone untreated owing to a lack of staff and funding to identify, analyze, and prepare thinning projects on all potential treatment areas (see footnote 5). The failure to conduct precommercial thinning can limit future stand development options, leading to overstocked, stagnant stands that halt or slow development of late-successional stand structure and features, and limit future timber production options on AMA lands (see footnote 5). This lack of funding and staffing is likely to be the most important limiting factor in the future, as the forest's budget likely will continue to decline.
- **Access**. Another factor that has limited precommercial and commercial thinning is reduced physical access to sites where these activities could take place. Several roads washed out as a result of flood events in the late 1990s and early 2000s. Repair of these roads has been slowed by the procedural requirements of the Plan, timing restrictions under the Endangered Species Act (ESA), and lack of funding. Money to undertake road repairs is scarce (the road program was tied to the timber program, and with the disappearance of the timber program, road money has also disappeared), and comes mainly from the Emergency Relief for Federally Owned Roads (ERFO) program. In addition, a lack of road maintenance dollars has made maintenance of the full forest road system unrealistic. Finally, an aggressive program of road decommissioning has occurred as a central strategy for restoring watershed health on the forest, a goal emphasized by the Plan. Meanwhile, few new roads are being built on the forest. All of these factors have combined to reduce access to stands in which commercial and precommercial thinning are desirable.
- **Survey and manage**.[12] The most abundant survey and manage species on the Olympic National Forest are mollusk, lichen, and bryophyte species. Extensive survey requirements for some species prior to implementing projects have caused delays with timber sales and harvests. One species in particular—the warty jumping slug (*Hemphillia glandulosa*)—delayed a number of timber sales on the forest between 1999 and 2000. This slug was listed as a survey and manage species, as it was thought to be rare on the Olympic Peninsula. After extensive surveying, the slug was found to be fairly abundant and, in 2001, was removed from the survey and manage list on the Olympic National Forest. This allowed timber sales and other activities to proceed without having to protect all of the sites where the slug had been found, although management would still be done to provide habitat for these and other mollusks.

  Apart from the warty jumping slug, survey and manage requirements have not had a significant impact on forest management activity. In 2004, the survey and manage list was eliminated and all of the listed species were moved to the sensitive species list. This change in the survey and manage requirements should reduce its impacts on commercial and precommercial thinning programs in the future.
- **Endangered Species Act**. Implementation of the ESA has led to timing restrictions on all ground-disturbing activity (including timber harvests) on national forests that could potentially harm listed

[12] A "Survey and Manage" mitigation measure was developed as part of the Standards and Guidelines of the Northwest Forest Plan. The measure required that certain rare species be surveyed prior to any ground-disturbing activities on the national forest so that the location of these rare species could be considered and mitigated for in the design of the projects (ONRC 1999). About 420 of these species were included in one or more of the survey and manage categories. Most of these species were plants and other invertebrates, such as wildflowers, mollusks, fungi, moss, lichens, and insects.

species (i.e., northern spotted owl (*Strix occidentalis caurina*), marbled murrelet, native salmon [*Oncorhynchus* spp.] and trout [*Oncorhynchus* spp.]). For example, activities can only occur during certain times of day and year such as nonnesting periods for spotted owls and marbled murrelets. As a result of these timing restrictions, the work season is often dramatically compressed. The shortened work window has meant that it commonly takes longer to complete projects (such as timber harvesting). Projects that previously were completed in a year are now often carried over multiple years. It is important to note that these restrictions are associated with the ESA and would have occurred with or without the Plan. Nevertheless, these timing restrictions will most likely continue to affect project implementation, which can reduce the volume of timber harvesting that can be carried out.

Nontimber Forest Products[13]

Overview—

Nontimber forest products (NTFPs; also known as "special forest products") include floral greens (e.g., salal [*Gaultheria shallon* Pursh], beargrass [*Xerophyllum tenax* (Pursh) Nutt.], ferns, moss), mushrooms, medicinal plants, firewood, Christmas trees, poles and posts, limbs and boughs, transplants, and other nonconvertible and plant products obtained from the forest. Nontimber forest products are harvested for recreational, cultural, medicinal, subsistence, and economic purposes. For example, many people living in communities surrounding the Olympic National Forest rely on firewood collected from the forest for heating their homes. Plants such as beargrass, ferns, and cedar bark are critical for basketry and other cultural products for peninsula tribes. Mushrooms, especially chanterelles (*Cantharellus* spp.), are important commercially on the peninsula. Floral greens obtained from the Olympic Peninsula represent a multimillion dollar industry, supplying an international market.[14] Because of the growing economic importance of NTFPs and increased commercial demand, management and control over the harvest of NTFPs has become a growing concern on the Olympic National Forest.

Trends—

The demand for salal and other plants used in floral arrangements (e.g., beargrass, sword-fern [*Polystichum* spp.]) on the Olympic National Forest increased between 1990 and 2002. In contrast, the quantity of permits sold for other NTFPs remained the same or declined. The number of Christmas trees steadily declined, with the exception of a large number of sales in 1998 (fig. 6). The quantity of mushrooms sold remained relatively stable, with the exception of a large number of sales in 1998 (fig. 7). Fuelwood sales have gradually declined since 1994 (fig. 8). The sale of mosses went from 30,000 to 40,000 pounds per year in the late 1990s to the termination of permits in 2002 (fig. 9).

Changes to the program—

The Olympic National Forest has been divided in its approach to managing the harvest of floral greens, particularly salal. The forest had been issuing individual permits to anyone wanting to harvest salal and a few other species since at least 1994. In 2000, the Hood Canal District stopped selling individual permits, and initiated a contract model in which individual contractors lease a large area of land. Reasons for this shift include budget and personnel reductions that made the contract model

[13] The nontimber forest products data come from the Forest Service Automated Timber Sale Accounting System. The data are displayed by fiscal year. The Forest Service did not track permit data for different categories of nonconvertible special forest products prior to 1995. The most recent year for which data were available at the time we collected data for this project was 2002. The Forest Service did track permit data for fuelwood, posts and poles, and Christmas trees (all convertible products) prior to 1995. We provide these data for 1990 onward, to include the whole study period.

[14] A growing Hispanic population, many of whom are recent immigrants, does the majority of harvesting. The Hispanic community on the Olympic Peninsula has grown substantially, in part owing to the availability of jobs picking brush for the floral greens market. The growth in the Hispanic population has changed the face of many communities on the peninsula. Long-time residents describe some racial tensions that have developed and an increased burden on social services, but also talk about the importance of the Hispanic population in supporting local businesses and helping to keep school enrollment relatively stable, despite a loss of many families from the area.

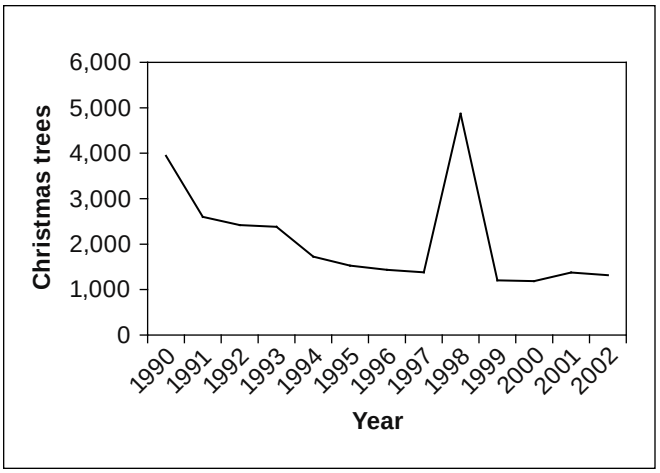

Figure 6—Christmas trees sold, Olympic National Forest, 1990–2002.

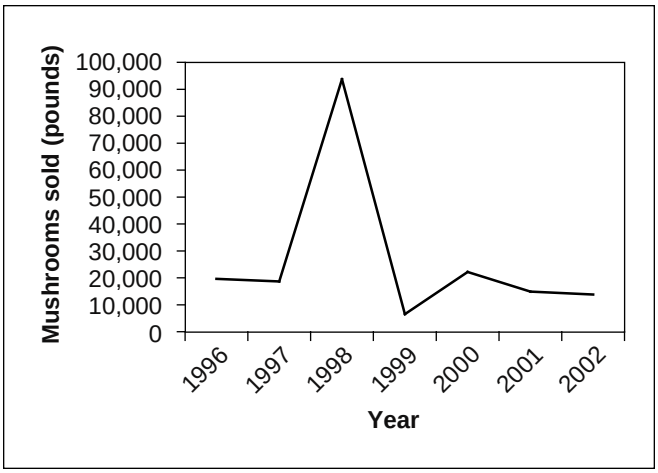

Figure 7—Mushrooms sold, Olympic National Forest, 1995–2002.

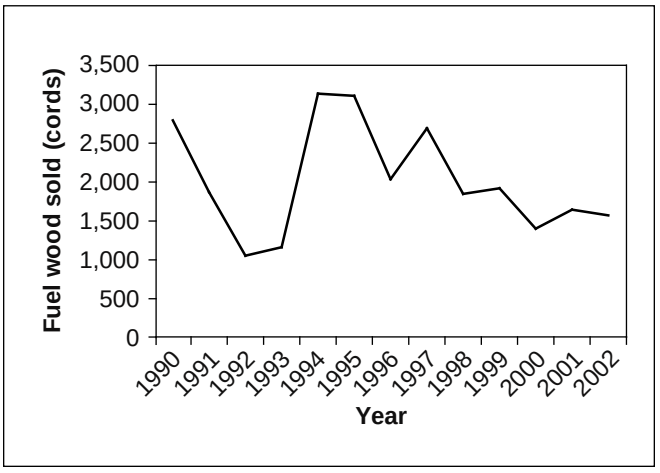

Figure 8—Fuel wood sold, Olympic National Forest, 1990–2002 (thousand board feet × 2.5 = cords).

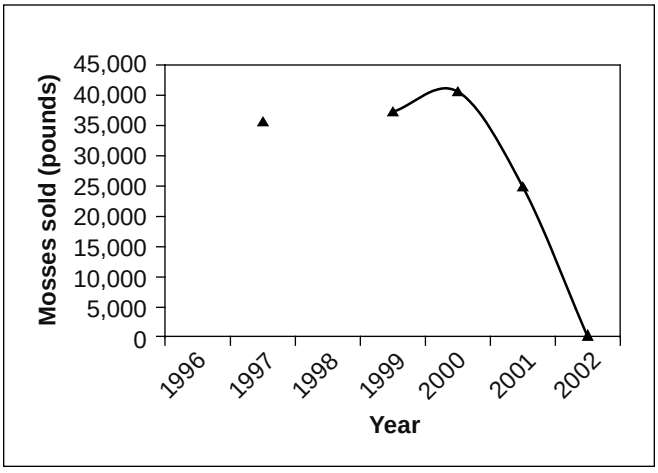

Figure 9—Mosses sold, Olympic National Forest, 1995–2002.

easier and less costly to administer. The district was also having problems with NTFP theft; and this was a way to ensure that only contractors and their employees were harvesting in designated areas. The contract model requires contractors to pay up front, which precludes most individual harvesters (most of whom are Hispanic immigrants) from submitting bids. The result of this new contract model is that there have been few bids for contracts. In contrast to the east side, the Pacific Ranger District continues to issue individual permits to harvesters.

The forest also stopped issuing permits for bough harvesting in 2002 owing to theft problems and tree damage. Moss harvesting was also terminated in 2002 for two reasons: (1) monitoring indicated that moss that had been harvested needed a longer time to grow back; and (2) the presence of important moss-associated species, including potential species of concern under the Plan, made it important to evaluate the effects of moss harvest on these species. In the absence of methods and funding to do so, the forest ended the legal harvest.

Demand for floral greens has increased over the past 10 years. The Plan has had little to do with this change; however, the increase in road closures, road washouts, and road decommissioning that are in part associated with the Plan have reduced access for harvesters. Although ecosystem changes as a result of the Plan have yet to have an

impact on the ecology of NTFPs, some interviewees were concerned that in the future, as the forest matures and less light penetrates the tree canopy, the availability of important NTFP species (such as salal) may decline.

Changes in the administration of NTFPs on the forest are connected to funding cuts associated with declining timber harvests. Sources stated that there are simply not the resources and staff available to devote to the NTFP program. The timber program currently administers all NTFP harvest activities. According to Lynch and McLain (2003), Knutson-Vandenberg (KV) funds (i.e., funds set aside from timber receipts) traditionally funded NTFP activities. With the drop in timber harvesting and associated timber revenues, KV funding for other activities has also dramatically decreased. Furthermore, revenues generated from the sale of NTFP permits go to the general treasury, rather than being available locally to help fund the program (Lynch and McLain 2003).[15]

The Olympic National Forest has made efforts to communicate and work with brush harvesters. These efforts include trying to sensitize law enforcement officers to some of the issues facing harvesters, providing pamphlets and information to harvesters in Spanish, and working directly with the harvesters or nonprofit groups to improve communication and understanding and promote responsible harvest practices.

Grazing

The Olympic National Forest currently has no permits to graze livestock. Grazing has been negligible on the forest over the past 10 years, with a maximum of 12 head of cattle grazing on the forest.

Recreation

Overview—

The recreation potential on the Olympic National Forest is especially high owing to the presence of the Olympic National Park, which draws tourists from around the world, and the forest's proximity to the Seattle-Tacoma-Olympia metropolitan areas. Compared to other national forests in the Plan (i.e., spotted owl) region, however, the recreation program for the Olympic National Forest is relatively small in terms of its budget and staff. Because the forest has historically been a timber-producing forest, very little investment went into the development of a recreation infrastructure.

Trends—

Recreational use on the Olympic National Forest has steadily increased to a modest degree since the 1980s. The increase can be explained largely by the growing urban population in the Puget Sound area. Table 1 shows that the number of total recreation visitor days increased from 1.47 million in 1986 to 1.71 million in 2000 (or about 16 percent). Figure 10 shows that revenues for recreation have steadily declined since 1996. In 1996, however, the Forest began to implement the Recreation Fee Demonstration Program (PL 104-134), which requires visitors to purchase a permit—the Northwest Forest Pass—for vehicle parking

Table 1—Recreational use on the Olympic National Forest, 1986, 1998, and 2000

Year	Developed recreation (visitors)	Dispersed recreation (visitors)	Total recreation visitor days
1986	370,000	1,100,000	1,470,000
1998	391,000	1,279,000	1,670,000
2000	430,000	1,280,000	1,710,000

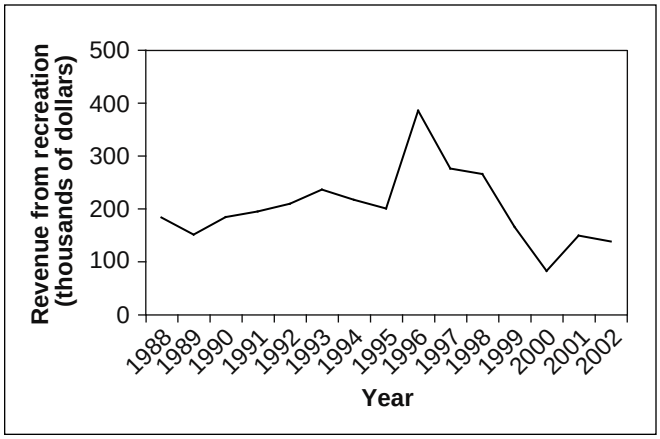

Figure 10—Revenue from recreation on the Olympic National Forest, 1988 to 2002.

[15] At the time this report was written, legislation was being developed to change this.

at certain trailheads, picnic areas, boat launches, and other designated recreation areas. Eighty percent of the revenues collected from the program stay within the local area and fund recreation maintenance and administration, and public health and safety improvements (see footnote 5). Table 2 shows that funds collected through the program have increased steadily from just over $117,000 in 1999 to around $292,000 in 2003. Revenues generated from this program have helped to offset some of the budget declines of the recreation program. Table 3 shows that the number of trails and campgrounds has increased on the forest since 1990, although there are fewer miles of roads.

Table 2—Revenues generated from the Recreation Fee Demonstration Program, Olympic National Forest

Year	Fees collected for recreation maintenance	Fees collected for recreation administration	Total collected from Recreation Fee Demo Program
		Dollars	
1999	117,219		117,219
2000	134,423		134,423
2001	176,838	16,831	193,669
2002	281,170	8,460	289,630
2003	261,092	31,377	292,469

Changes to the program—

Impacts of the Plan on the recreation program include relocation of campsites out of flood zones, reduced access to recreational areas owing to removal or decommissioning of roads, and relocation or decommissioning of recreation facilities to meet habitat protection/ecosystem management goals (see footnote 5). The forest has also experienced delays in the completion of recreation projects owing to the shortened period of operation, as well as from survey and manage requirements. For example, as with other activities on the forest, recreation projects have had to comply with all the requirements under the Plan, including disturbance issues surrounding ESA-listed species, survey and manage requirements, and protection of aquatic habitats. Consequently, the work season to carry out projects is considerably shorter than in the past, lengthening the time it takes to complete projects. As with many of the programs on the forest, budget cuts and staff reductions over the past decade have left the recreation program understaffed making it more difficult to complete recreation projects.

One of the consequences of the staff reductions and budget cuts is the lack of a Forest Service presence in the forest, resulting in less maintenance of facilities, roads and trails; less face-to-face contact with campers; and less law enforcement capability. Forest Service employees reported an increase in uncontrolled, unmanaged recreation.

Because of the staff reductions and small budget, the forest depends heavily on volunteers to accomplish work such as trail maintenance. Volunteer groups include Volunteers for Outdoor Washington, and Washington Trails Association. Others include the Mount Ellinor Trail Crew, composed of 6 to 10 retirees between the ages of 60 and 80. The recreation program also partners with various groups including the Interagency for

Table 3—Recreation use and opportunities, Olympic National Forest, 1990 and 2000–2003

Recreation indicator	1990[a]		2000–2003[b]	
	Number	Daily capacity	Number	Daily capacity
Annual forest visits			456,000[c]	
Campgrounds	20	2,285	25	2,730
Picnic sites[d]	1	15	2	45
Trails (1990), trailheads (2003)	81		88	
Miles of trails	226.7		270.6[e]	
Miles of roads	2,600		2,254[f]	
Recreation residences	68		58[g]	
Hotels and resorts	1	416	1	416

[a] Data taken from the Olympic National Forest Land and Resource Management Plan final environmental impact statement.
[b] Data taken from INFRA for 2003 unless otherwise noted.
[c] National visitor use monitoring data, 2000.
[d] Does not include picnic sites located within campgrounds.
[e] Northwest Forest Pass Fee Demo Program fiscal year 2002 Accomplishments Report.
[f] Olympic National Forest Final Access and Travel Management Plan Summary Report, 2003.
[g] Data from USDA Forest Service, Pacific Northwest Region recreation staff, Jim Sauser (2002 data).

Outdoor Recreation, an organization that funds trail work and recreation development; the Backcountry Horsemen's Association; and Tacoma Urban League.

As mentioned above, the Recreation Fee Demonstration Program has helped to offset many of the budget and staff reductions—providing funding for recreation operations and maintenance. The Forest Service has made efforts to create more hiking trails, improve campsites, and regularly maintain facilities in certain areas of the forest, such as the Lake Quinault area, which has historically drawn tourists to the lake and historic lodge.

Forest Jobs and Budget

National forests are an important source of quality jobs for people in forest-based communities. Forest employees earn good wages, receive benefits, enjoy relatively safe working conditions, have training opportunities to develop new skills, and have opportunities for advancement within the organization. Figure 11 shows the number of full-time equivalent (FTE) positions on the Olympic National Forest between 1993 and 2003. One FTE can represent one full-time job, or a combination of part-time positions, counted in aggregate. They include permanent, temporary, and term tenures.

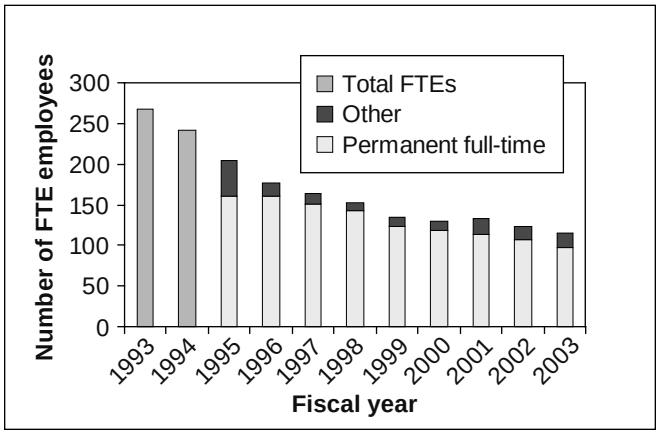

Figure 11—Number of full-time equivalent (FTE) employees on the Olympic National Forest, 1993–2003. (Source: USDA Forest Service, Pacific Northwest Region).

Note: Data classifying FTEs into permanent full-time and other positions were not readily available for the Forest Service Pacific Northwest Region for 1993 and 1994. Aggregate staffing for Forest Service Northwest Forest Plan units for these years is therefore enumerated as FTEs only. Data enumerating positions by series (e.g., wildlife biologist, budget specialist) and grade level/pay scale (e.g., GS-9) were not readily available. This limitation precluded a more detailed evaluation of workforce composition, or an analysis of the economic benefits of local agency employment to individual communities. The agencies and regions also differ in their handling of staffing and data. For example, in 2003, field-unit positions in information resources management began to be tracked under regional staffing. The effect of this change on the staffing data described here is unknown.

Changes in Jobs With the Forest Service

The budget for the Olympic National Forest was historically (and still remains) heavily linked to its timber output. Declining timber revenues have thus resulted in significant budget and staff reductions for the forest overall and especially within the timber and roads programs. These declines can be attributed to several factors including the termination of harvest on the national forest portion of the Shelton Cooperative Sustained Yield Unit in 1985 by Simpson Timber Company; the 1990 spotted owl injunction that significantly decreased timber harvesting on the forest; and implementation of the Plan, which continued to maintain low harvests levels (see footnote 5). Another important factor has been the overall decline in federal budgets during the late 1980s, 1990s, and into the 2000s (see footnote 5).

Trends

The workforce on the Olympic National Forest has declined dramatically since the 1980s. In 1985, prior to the termination of timber harvesting by Simpson Timber Company on the Shelton Cooperative Sustained Yield Unit, the forest employed 470 FTEs, of which approximately 70 percent were permanent employees and 30 percent were temporary/seasonal employees (see footnote 5). By 1994, the workforce had declined to 235 FTEs, of which over 90 percent were permanent employees (see footnote 5). By 2001, the workforce was down to 115 FTEs, with 17 being nonpermanent employees (fig. 11). Thus, the total number of employees decreased by over 75 percent since 1985, with temporary/seasonal employees disproportionately affected. The total budget for the Olympic National Forest has declined by about 50 percent since the implementation of the Plan, from approximately $21 million in 1993 to $10.6 million in 1993 (fig. 12).

In addition to budget and staff declines, in 1999 the forest consolidated its four districts into two. The Forks

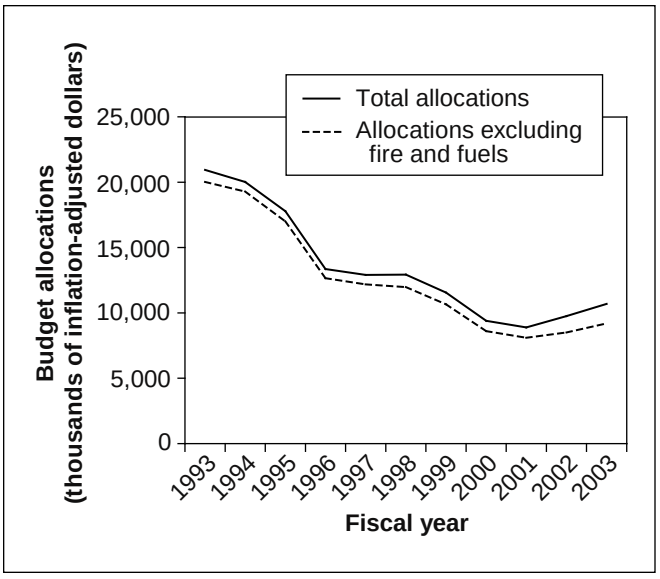

Figure 12—Olympic National Forest Budget Allocations, 1993–2003. (Source: USDA Forest Service, Pacific Northwest Region).

(i.e., Sol Duc) and Quinault Districts merged to become the Pacific District, and the Hoodsport and Quilcene Districts merged to become the Hood Canal District. Despite these mergers, the forest still operates its four district offices, as well as the main supervisor's office in Olympia. District rangers share their time between the two district offices, and a small staff still remains at each office.

Impacts of Budget and Staff Changes

Many interviewees reported that the budget and staff declines and district consolidations have reduced their ability to complete all of their work. For example, many interviewees noted that more precommercial and commercial thinning could be taking place on the forest for the development of late-successional and old-growth stands, but there is simply not the staff and resources to prepare and implement these projects. Workloads and job complexity have actually increased for most employees owing to the new rules and requirements surrounding the implementation of the Plan (see footnote 5).

Reductions in staff have also been felt most heavily in the lower ranking positions (e.g., at the GS-5 through GS-9 levels), as the job retention preference is toward those with seniority. The result has been fewer field-level employees to implement projects on the ground and fewer administrative and support staff. Reductions in these staff positions have meant that remaining Forest Service employees are now responsible for more administrative work, adding to their workload and overhead costs. In addition, most senior employees have worked on the forest for many years and are reaching retirement age. The loss of these long-term employees will likely have a significant impact on the institutional memory and future capacity of the forest (see footnote 5).

Staff reductions and district consolidations have also affected the level of outreach and interaction the Forest Service has with the public and neighboring communities. Many interviewees felt that the lack of staff, particularly field staff, has reduced the forest's ability to interact with the public, particularly with regard to law enforcement and security issues around recreation and NTFP harvesting. Historically, many of the lower ranking and seasonal jobs also provided important job opportunities for community members. The impact of these changes to communities will be discussed in more detail in chapter 3.

Contracting for Land Management[16]

Overview

One of the goals of the Plan was to increase the level of contracting for ecosystem management-related activities to help create jobs and offset job losses from declining timber harvests. Procurement or service contracts include a wide range of activities that can be broken into three categories: technical work (i.e., surveying, monitoring), equipment-intensive work, and labor-intensive work. From 1990 through 2002, the Olympic National Forest spent $46.7 million procuring land management services. Overall, the amount of money spent on contracting since 1990 has declined, with the exception of a spending spike in 2001[17] (fig. 13). Not only did the amount of money spent on contracting decrease over the study period, but the type of

[16] An explanation of the methods used to collect and analyze the procurement contracting data can be found in Moseley (2006).

[17] In 2001, the Olympic National Forest spent a considerable sum on road maintenance as well as additional technical activities such as surveys and inspections. Much of this spending was a result of a series of floods in the late 1990s and early 2000s. In 2001, emergency flood relief monies became available to fund road repairs.

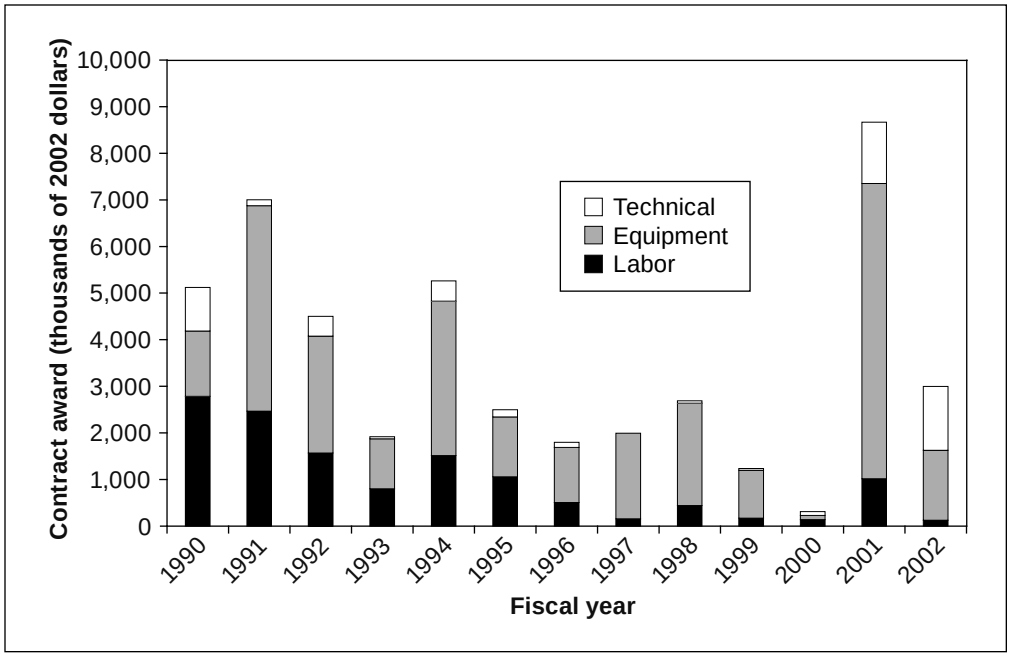

Figure 13—Annual land management procurement spending (adjusted for inflation) by work type, Olympic National Forest, fiscal years 1990–2002.

work contracted also shifted from labor-intensive activities (such as tree planting) to more heavy-equipment and technical work. For example, when the forest was actively harvesting timber, the forest contracted out large amounts of reforestation and other pre- and postharvest activities.

Changes in Spending and Contracted Activities

Spending on labor-intensive activities declined over time, falling from $6.8 million in 1990–92 to $1.3 million by 2000–2002[18] (fig. 14). Among labor-intensive activities, tree planting and land treatment practices, and slash piling declined most noticeably, while tree thinning declined more slowly (fig. 15). By contrast, spending on equipment-intensive activities and technical work dipped during the mid-1990s, but partially recovered during 2000–2002 (fig. 14).

Equipment-intensive activities associated with timber management, such as aerial fertilization, declined, but road maintenance increased throughout the study period. In addition, riparian restoration and stream restoration involving heavy equipment increased (fig. 16).

Spending on stand exams and tree survival surveys declined noticeably, while spending on biological and watershed surveys increased. Species surveys may be grouped in "other natural resource management and conservation," along with many other types of activities. In addition, the forest increased its procurement spending on watershed analysis and management plans, although it is likely that inhouse staff performed most of these activities (fig. 17).

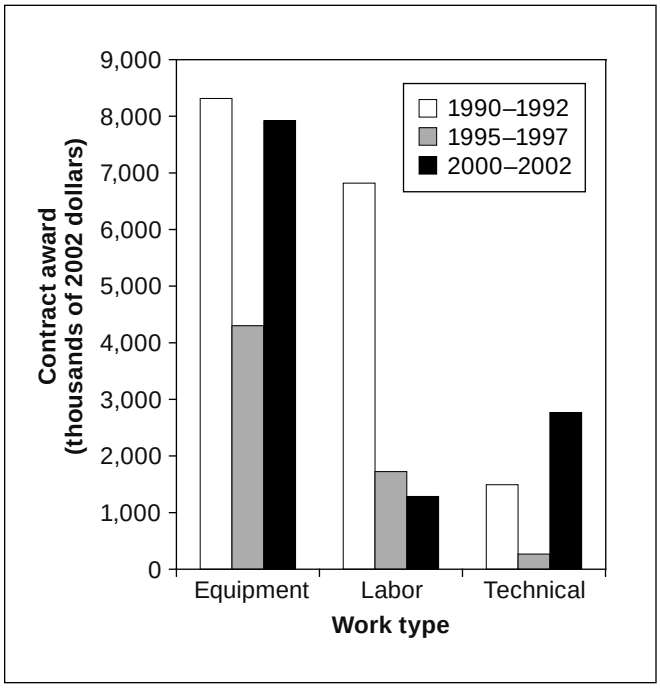

Figure 14—Land management procurement spending (adjusted for inflation) by work type, Olympic National Forest, fiscal years 1990–1992, 1995–1997, and 2000–2002.

[18] For this analysis, we examined three periods: 1990–1992, 1995–1997, and 2000–2002 (refer to Moseley 2006) for more details).

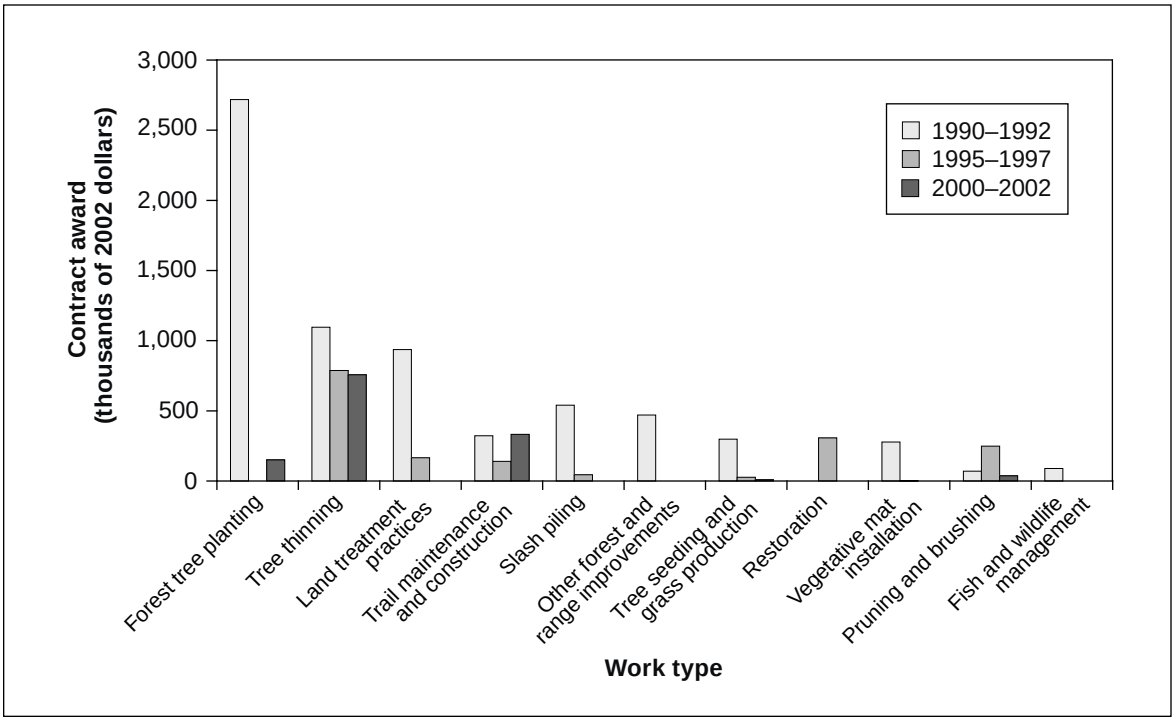

Figure 15—Labor-intensive contracting (adjusted for inflation) by detailed work type, Olympic National Forest, fiscal years 1990–1992, 1995–1997, and 2000–2002.

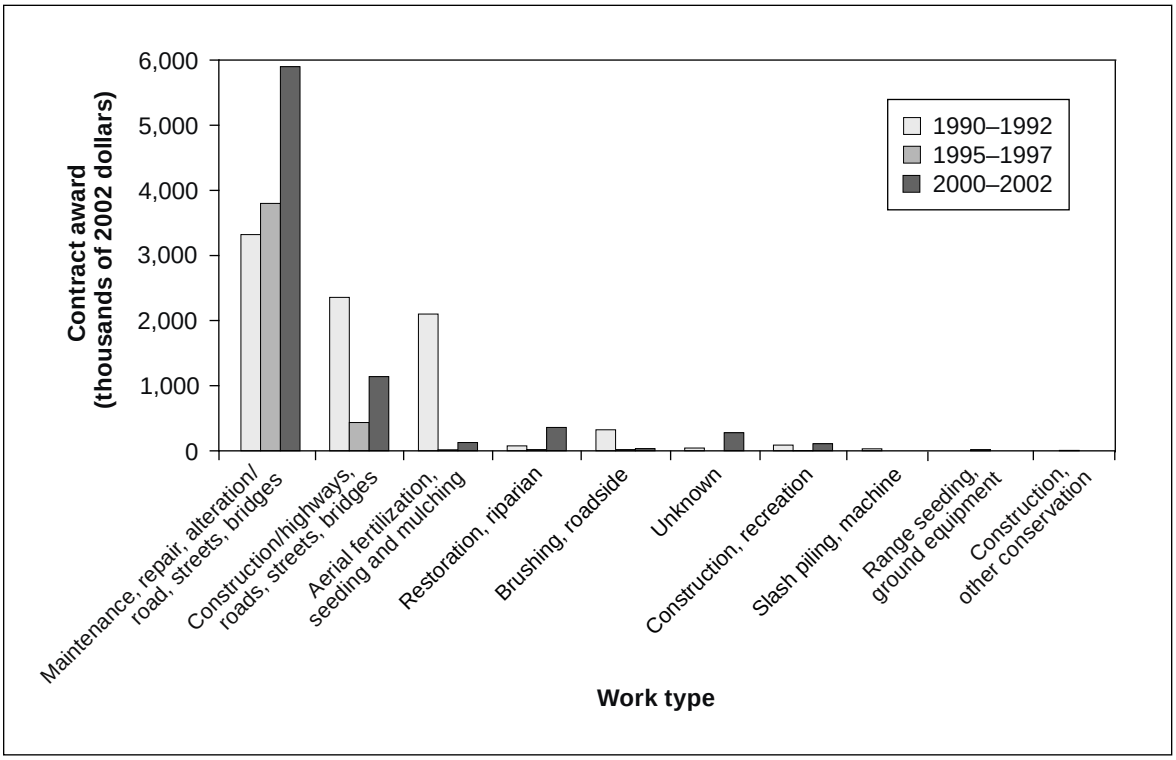

Figure 16—Equipment-intensive contracting (adjusted for inflation) by detailed work type, Olympic National Forest, fiscal years 1990–1992, 1995–1997, and 2000–2002.

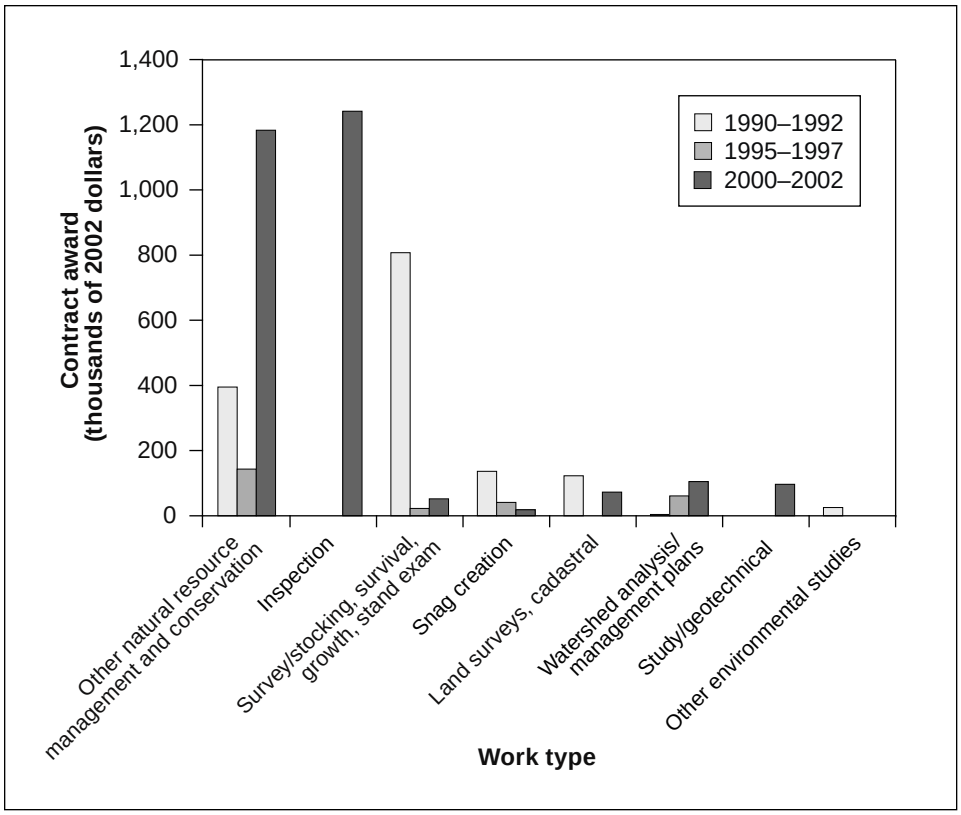

Figure 17—Technical contracting (adjusted for inflation) by detailed work type, Olympic National Forest, fiscal years 1990–1992, 1995–1997, and 2000–2002.

Although procurement spending on the Olympic National Forest did not decline as much as on other national forests, it shifted noticeably from activities associated with timber management to those associated with ecosystem restoration, including spending on species surveys and road restoration.

Concentration and Turnover of Contractors

The number of contractors working for the forest decreased by 54 percent (from 110 to 51) between 1990–92 and 2000–2002. This decline was much faster than the rate of decline in spending, which declined by only 28 percent. Consequently, the forest's average total award per contractor increased from $155,000 in 1990–92 to $237,000 by 2000–2002. Among the remaining 51 contractors, however, the relative market concentration did not change particularly. In 1990–92, 8.2 percent of contractors captured 50 percent of the forest's procurement spending and in 2000–2002, 7.8 percent captured 50 percent, a minor difference. However, in 1990–92, the 8.2 percent amounted to nine contractors whereas in 2000–2002 the 7.8 percent amounted to four contractors, because the contractor pool was half as large as before (table 4).

Of the 110 contractors working for the Olympic National Forest in the early 1990s, 100 of them were no longer working for the forest a decade later, and new contractors replaced only 41 of them. Ten contractors worked in both periods. On average, these returning contractors captured more contract value on the forest than the rest of the contractor pool.

Table 4—Contractors by size of award, Olympic National Forest, fiscal years 1990–1992 and 2000–2002

	1990–1992		2000–2002	
	Number of contractors	Percentage of contractors	Number of contractors	Percentage of contractors
		Percent		*Percent*
1st quartile	2	1.82	1	1.96
2nd quartile	7	6.36	3	5.88
3rd quartile	15	13.64	7	13.73
4th quartile	86	78.18	40	78.43
Total	110	100.00	51	100.00

Note: This table groups contractors by size of contractors' awards. The largest contractors that together capture one fourth of the contract value are in the first quartile. The smallest contractors that together capture one fourth of the contract value are in the 4th quartile. Thus, for example, the largest two contractors in 1990–1992 captured the same total value as the smallest 86 contractors. Chi square: $p < 1.000$.

Location of Olympic National Forest's Contractors

Between 1990 and 2002, the Olympic National Forest largely awarded contracts to contractors in Oregon and Washington, with a small number of awards to contractors in northern Idaho and northwestern Montana. Labor-intensive and equipment-intensive contracts went to both local and distant contractors (fig. 18). However, the forest awarded more equipment-intensive contracts to nearby contractors than labor-intensive contracts.

On average, local contractors did not capture more contracts in the early 2000s than they did a decade earlier. The Olympic did award proportionately more contracts to rural contractors (people living in communities with populations of less than 5,000 people) by 2000–2002. However, contractors located in communities with populations between 5,000 and 10,000 people captured somewhat less contract value between the two periods (table 5). This suggests that when considered together, contractors from rural communities and small towns captured slightly less contract value (decline from 66.9 percent to 63.7 percent) than the previous decade. Given the general decline in contract awards, rural and small town contractors captured considerably less contract value in 2000–2002 than they did in 1990–92 (a decrease of $3.7 million).

Over the study period, contract awards to contractors located in the Willamette Valley and southern Oregon decreased, and by 2000–2002, the majority of contractors were located in either northwest Washington or along Interstate-5 in Washington (fig. 19). Given the noticeable cluster of contract awards in the Puget Sound area, it might be expected that urban contractors would have captured a large percentage of the forest's contract offerings. However, urban contractors received only 14.0 percent and 7.2 percent of the forest's contracts in 1990–92 and 2000–2002, respectively. This suggests that although the contractors who work on the Olympic were clustered around Puget Sound, they were typically located in the area's small- and medium-size towns rather than in the urban areas such as Seattle, Tacoma, or Olympia.

Awards to Contractors in Affected Counties

Excluding contracts awarded to contractors in unknown locations, from 1990 through 2002, the forest awarded 87.1 percent of total contract value to contractors located in affected counties (fig. 20). Interestingly, the Olympic National Forest's awards to contractors located in affected counties was lower in 1995–97 compared to 1990–92 and 2000–2002. One explanation for this is that funding was exceptionally high in both the 1990–92 and 2000–2002 periods. In 1990–92 the forest initiated an aggressive watershed restoration program. In 2000–2002, funding was also high owing to an influx of federal funds (through the ERFO fund) for repairs to roads damaged by floods in the late 1990s and early 2000s.

Contractors located along the Interstate-5 corridor in Washington and Oregon captured more contract value than contractors from the Olympic Peninsula. Most interviewees felt that although some of the contracts went to local contractors, there was no hiring preference for locals. Some people attributed this to restrictions in federal contracting laws that prohibited preferential hiring based on locality. Others felt that there was some flexibility toward local preference under the Plan and Title II of the Secure Rural Schools and Community Self-Determination Act[19] through a preapproval process. Some interviewees noted that, although

Table 5—Percentage of contract value by contractor's community size, Olympic National Forest, fiscal years 1990–1992 and 2000–2002

Community population (1998)	1990–1992		2000–2002	
	Real dollars	*Percent*	*Real dollars*	*Percent*
<5,000	3,203,000	18.8	3,487,000	28.8
5,000–9,999	8,201,000	48.1	4,215,000	34.9
10,000–50,000	2,010,000	11.8	2,495,000	20.6
>50,000	2,388,000	14.0	872,000	7.2
Unknown	1,260,000	7.4	1,025,000	8.5
Total	17,061,000	100.0	12,095,000	100.0

Chi square: $p < 0.057$.

Chi square: $p < 0.02$ (excluding unknown category).

[19] See "Payments to County Governments" in chapter 2.

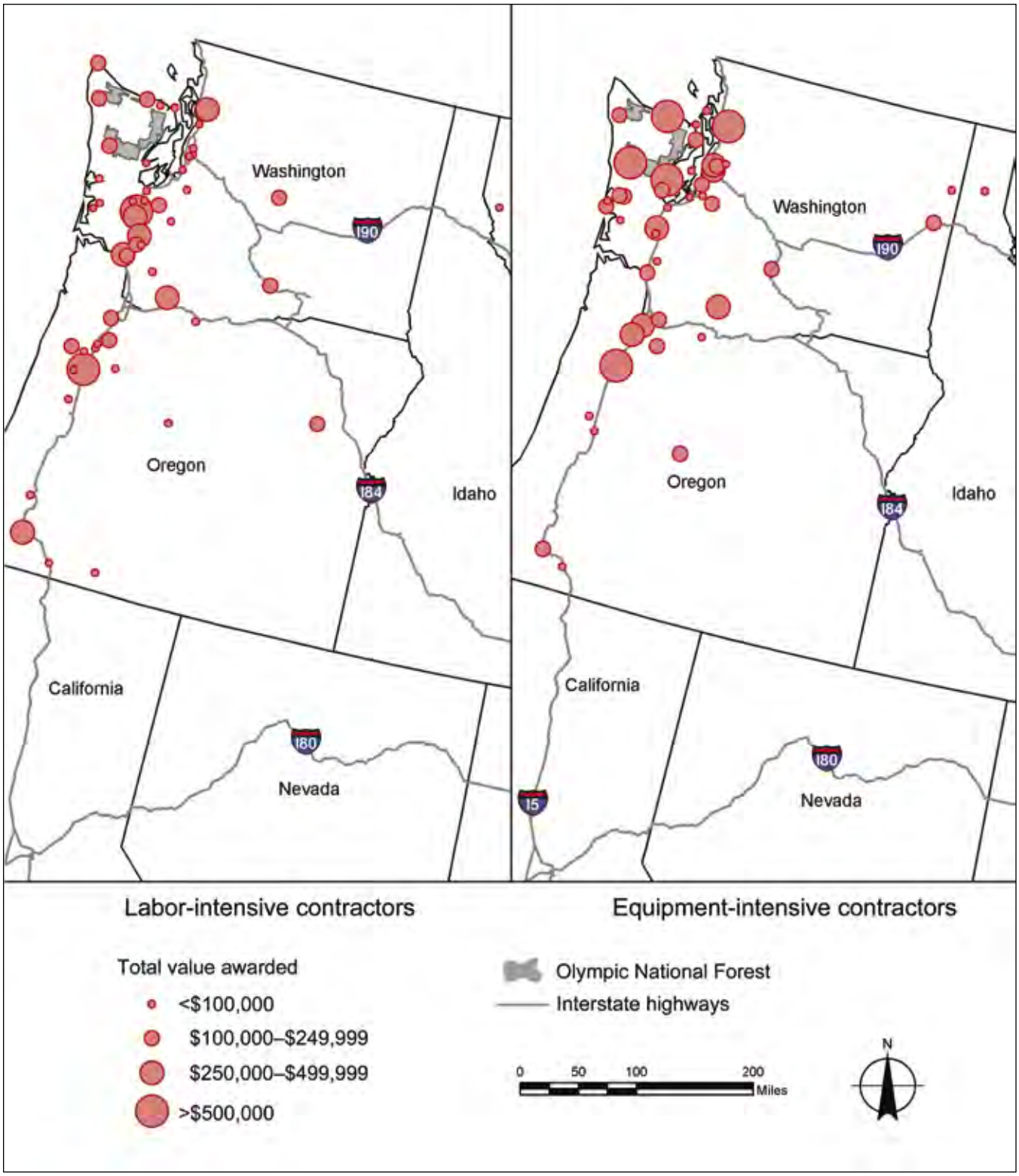

Figure 18—Comparison of labor-intensive and equipment-intensive contractor locations by ZIP code, Olympic National Forest, fiscal year 1990–2002.

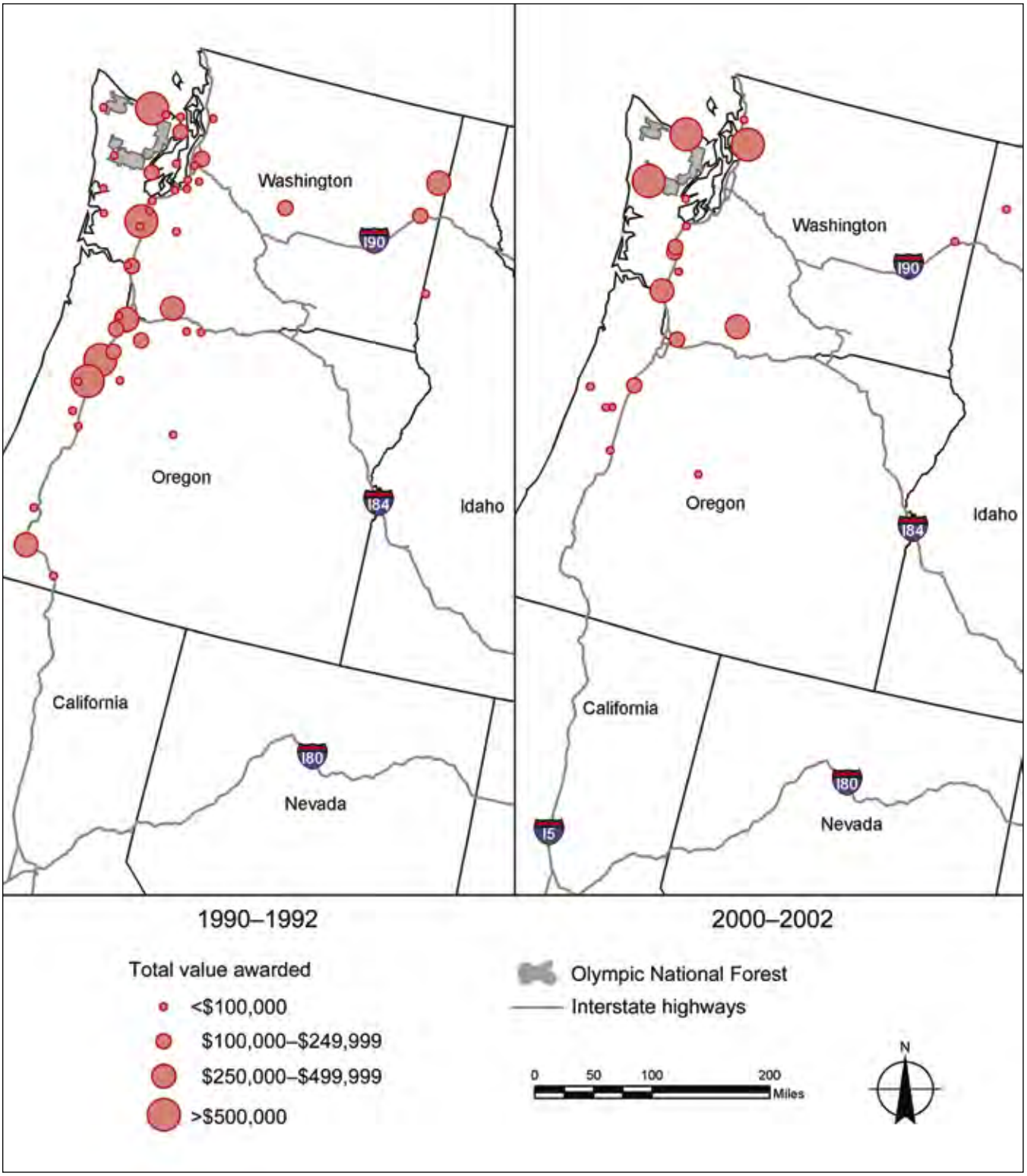

Figure 19—Location of contractors by ZIP code and total contract awards, Olympic National Forest, fiscal years 1990–1992 and 2000–2002.

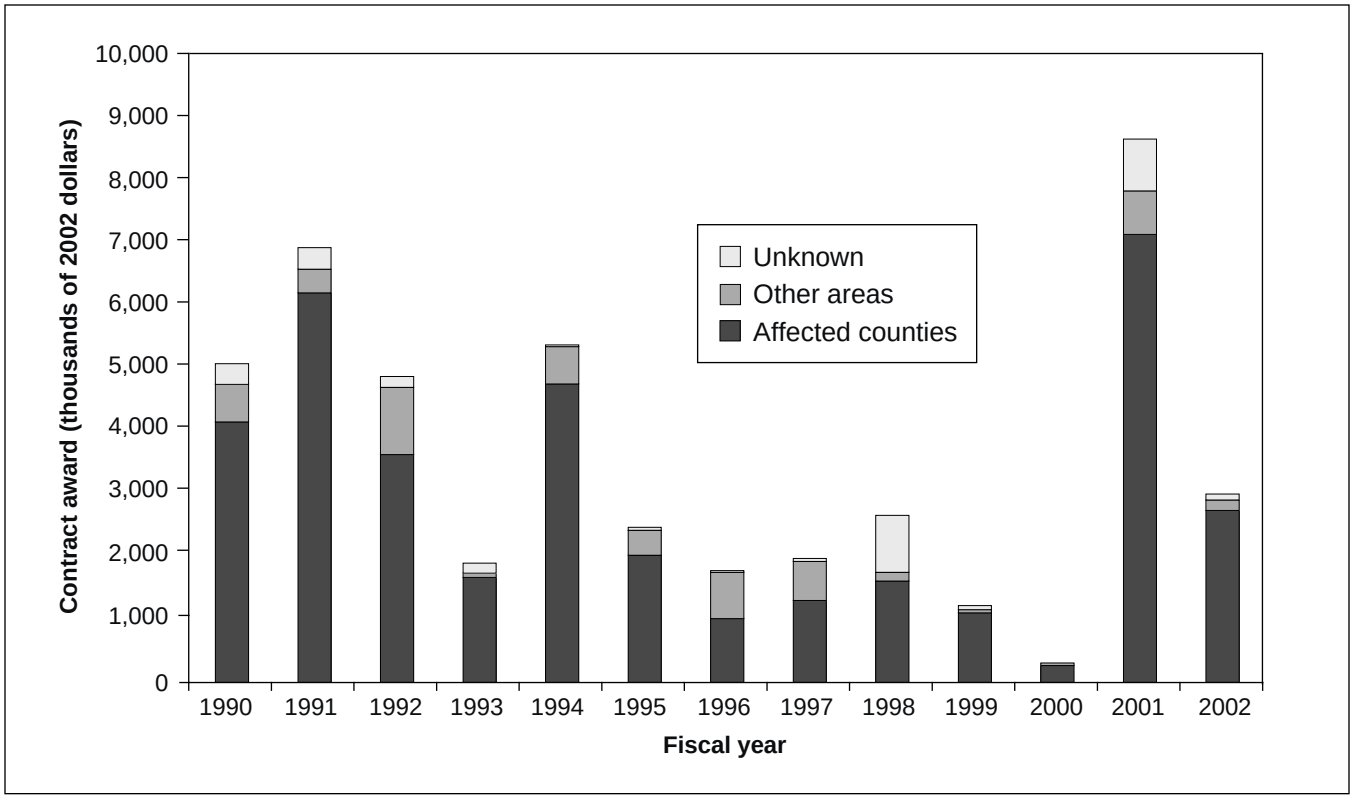

Figure 20—Contract awards (adjusted for inflation) to Northwest Forest Plan-affected counties, Olympic National Forest, fiscal year 1990–2002.

there may have been local preference written in the new contracting regulations under the Plan, contracting officers had reservations about adopting a new set of criteria.

Procurement spending on the Olympic National Forest declined less than for the Forest Service as a whole during this study period. The Olympic National Forest rapidly moved away from labor-intensive activities and activities associated with intensive timber management; spending on these activities had already diminished before 1995. However, not until the late 1990s and early 2000s did spending on technical and equipment-intensive activities associated with contracted surveying and restoration increase. One possible explanation is that road damage caused by floods in the late 1990s and early 2000s created the need for more technical and equipment-intensive activities. Flood relief funds (ERFO) became available for road repairs during this period.

The Olympic National Forest's contracting pool was clustered around the Puget Sound and along the Interstate-5 corridor. This pattern did not change throughout the study period. Local contractors did not capture proportionately more of the contracts in the early 2000s than they did a decade earlier. It is also striking that the number of contractors working for the forest declined by 50 percent, but procurement spending only dropped by 28 percent. Consequently, by the end of the study period, contractors working for the Olympic National Forest were capturing more money on average than the decade prior.

Community Economic Assistance

The Northwest Economic Adjustment Initiative

To help offset the jobs losses and economic downturns associated with reductions in access to timber on the Olympic National Forest, the Northwest Economic Adjustment Initiative (NEAI) was also launched in 1994, as the socioeconomic companion plan to the Plan. Approximately $1.2 billion was awarded to counties and communities in the spotted owl region between 1994 and 2000. Because a

separate assessment of the NEAI was recently completed (see Forest Community Research 2003), this report covers only grants administered by the Forest Service—namely Rural Community Assistance (RCA) Grants offered through the RCA Program, a program of the Forest Service's State and Private Forestry Division, under the administration of the Regional Office.[20] Since passage of the Secure Rural Schools Bill (Title II) in 2000, the Forest Service has also begun to award Title II grants, along with RCA grants. Additional grants are also now available from the National Fire Plan.

Rural Community Assistance Program

The RCA program was created with the passage of the 1990 Farm Bill (Title 23, Subtitle G, Chapter 2), which authorized the Forest Service to provide technical and financial assistance to natural resource-dependent rural communities, tribes, counties, municipalities, and unincorporated areas in and around national forests. With the passage of the Plan, RCA funds were dedicated to communities eligible under the NEAI to help improve economic opportunities, build capacity, and develop high skill family wage jobs. Eligible entities submitted applications to State Community Economic Revitalization Teams (SCERTs).[21]

Type of Grants

Although RCA funds have always been flexible to meet local community needs, prior to the Plan, RCA funds went primarily to projects that were oriented toward natural resource outputs and products, such as recreation planning projects and development of value-added forest products and NTFPs. Because eligibility for RCA funds required communities to develop strategic action plans with Forest Service involvement, as well as annual action plans that prioritized community needs, much of the funding also went to strategic action planning. In addition to the grants, the RCA program also provided technical assistance in project planning and leadership training.

With the Plan/NEAI, the RCA program changed its emphasis to funding high-priority projects identified by the communities themselves. The SCERT process (the WA-CERT in Washington) was the mechanism through which projects were awarded funding by state and federal agencies as part of the NEAI. Each county or tribe submitted a list of prioritized projects to the WA-CERT based on proposals and priorities submitted by communities and other eligible entities.

Because of this community-based orientation, many of the RCA grants went to projects that had little or nothing to do with the national forest or natural resources. Initially, much of the funding went to support basic infrastructure projects. Because many Washington communities had outdated water and sewer systems, they often faced moratoriums on growth by the Washington State Department of Ecology. Without the basic infrastructure in place, many communities found it impossible to do any type of economic development. Thus, RCA grants (usually matched or supplemented by other state, federal, or local funds) were often awarded to help upgrade water and sewer systems. In the mid-1990s, economic development efforts also focused on industrial recruitment, i.e., trying to attract outside businesses to a community through tax incentives, and available industrial space. Industrial park construction or renovation was thus viewed as a high-priority need by many communities. The RCA funds also went to these types of projects, primarily for the planning, engineering, and design phases, but also, at least early on in the Plan/NEAI, for construction. The RCA has also continued to be available for strategic action planning and leadership training.

Currently, development models have shifted to "development from within," that is, encouraging communities and businesses within communities to develop and expand as well as network and coordinate with other local businesses. The RCA grants have supported training efforts and workshops to help promote this type of development.

One advantage of the RCA funds has been its flexibility. With funds available for planning, including

[20] Another source of Forest Service funding came through the Old Growth Diversification Fund. Because these funds went directly to each state, and were administered and awarded by state agencies, they are not included in this assessment.

[21] Note that in this report, we limit our analysis of Forest Service financial aid to the types of projects and amount of funds awarded, and not to the effectiveness of these projects/monies. Because a more detailed assessment of the effects of individual grants/loans (under NEAI) was conducted in a previous study (FCR 2003), it was not included in this study.

preplanning, project design and engineering, the RCA funds often served as seed money to get a project off of the ground. Once set in motion, other state and federal funds, such as large construction grants, would be awarded to a project.

Trends in Granting Awards

Funding for the RCA program increased as a result of the Plan/NEAI. For communities, counties, and tribes surrounding the Olympic National Forest, the Forest Service RCA program awarded about $12 million in NEAI grants and loans, 1992–2003. These funds also helped leverage an additional $30 million (fig. 21). Funding remained relatively high, peaking in 1999, but since then has been decreasing (fig. 22). In 2003, the RCA program received no appropriated funds but was able to survive on $600,000 in carryover funding. The average amount awarded has also decreased. In the early years of the Plan, RCA would award up to $200,000 for a project. At the time of this study, grants were limited to $50,000 for a project.

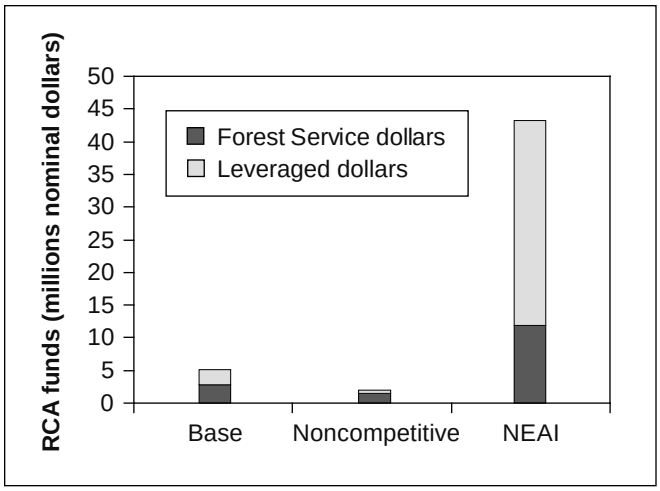

Figure 21—Dollars leveraged with community economic assistance, Olympic National Forest, 1992–2003. RCA = Rural Community Assistance. NEAI = Northwest Economic Adjustment Initiative.

Payments to County Governments

Under the Payments to States Act of 1908, county governments received 25 percent of National Forest revenues generated through collection receipts. Timber receipts (including purchaser road credits, Knutson-Vandenberg collections, and salvage sale fund payments) were by far the largest source of revenue to the Olympic National Forest during the 1970s and 1980s. The 25 percent of payments to counties were used to fund public schools and roads. In 1993, Congress passed the Omnibus Budget Reconciliation Act, which provided an alternative payment to 72 counties in Washington, Oregon, and northern California affected by the drop in federal timber harvest and associated timber revenues that resulted from administrative and judicial decisions designed to protect the northern spotted owl. These payments were known as "spotted owl safety nets" or "owl guarantee payments." Under this act, counties were to receive a declining percentage of the average annual payment they received between 1986 and 1990. This percentage would decline until 2003, when it would have reached 58 percent of the 1986–90 average. The owl guarantee payments then expired.

In 2000, Congress replaced the spotted owl safety net measures with the Secure Rural Schools and Community

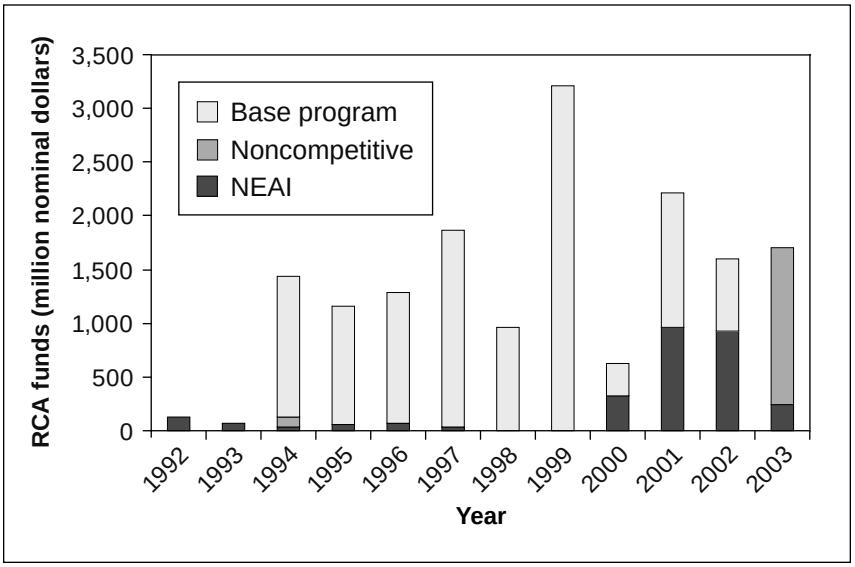

Figure 22—Community economic assistance funding, Olympic National Forest, 1992–2003. RCA = Rural Community Assistance. NEAI = Northwest Economic Adjustment Initiative.

Self-Determination Act, which expires in 2006. Under this act, counties receive money each year equal to the average of the payments received during the three highest years between 1986 and 1999. At least 85 percent of this money must be used to fund education and transportation projects (Title I). The remaining 15 percent is used to fund Resource Advisory Committees (RACs) and their activities (Title II) and the general county budget (Title III). The RACs were established by the act to promote collaborative relationships and to advise the Secretary of Agriculture on the use of Title II money. A committee is composed of 15 members that represent a balance between the environmental community; industry, commodity, and recreation interest groups; and government officials, educators, and general members of the public. The RACs review and recommend projects and associated funding that are proposed by members of the public. These 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 occur on federal land, or on nonfederal land where they would benefit federal land. Not only do RACs promote collaborative relationships between members of the public and federal agencies, the projects they fund provide employment opportunities for local residents.

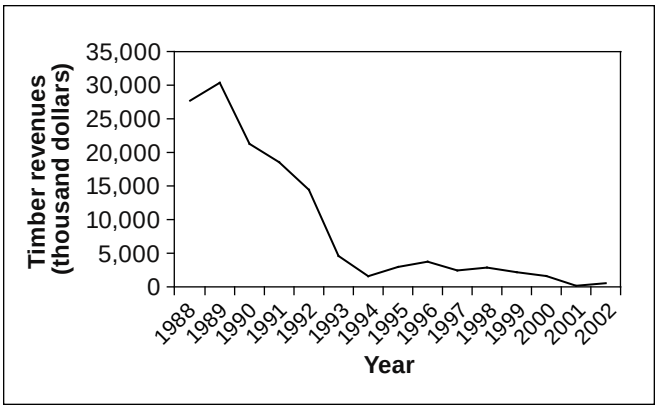

Figure 23—Collection receipts for timber revenues, Olympic National Forest, 1988–2002.

Figure 23 summarizes the downward trend in timber collection receipts that occurred on the Olympic National Forest between 1988 and 2002. Revenues generated by nontimber programs were meager compared with those that had come from the timber program (fig. 24). This demonstrates the importance of mitigation measures. Figure 25 shows the amount of money county governments received from the Olympic National Forest between 1990 and 2002. The

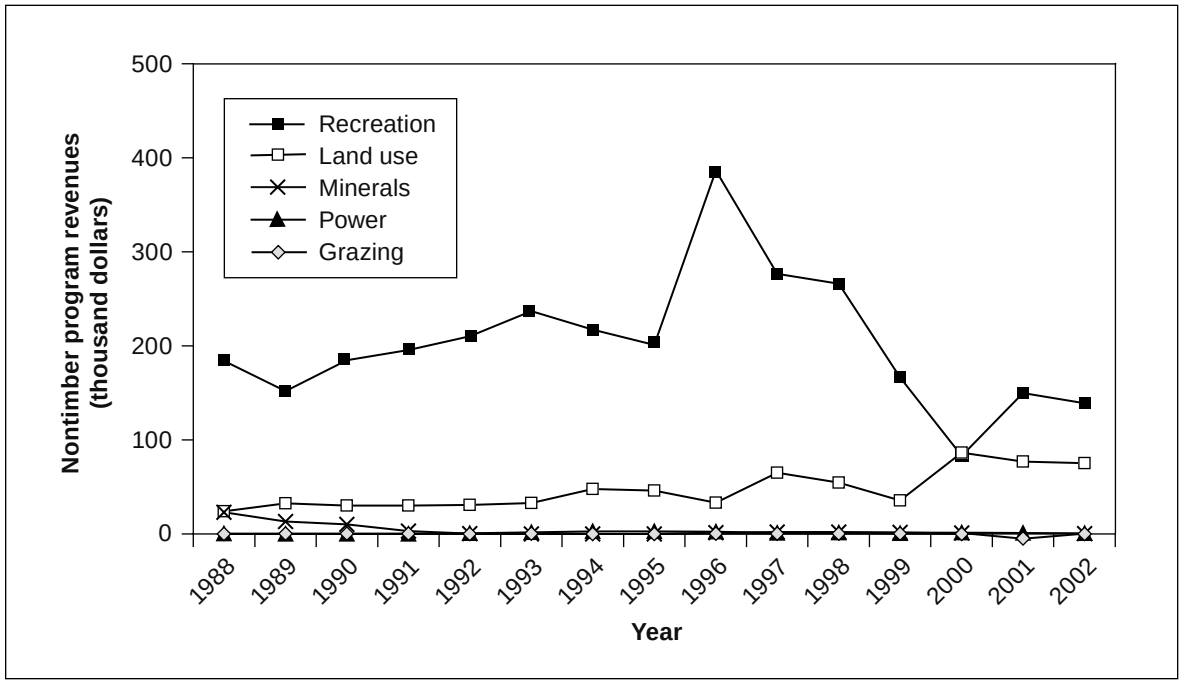

Figure 24—Collection receipts for nontimber program revenues, Olympic National Forest, 1988–2002.

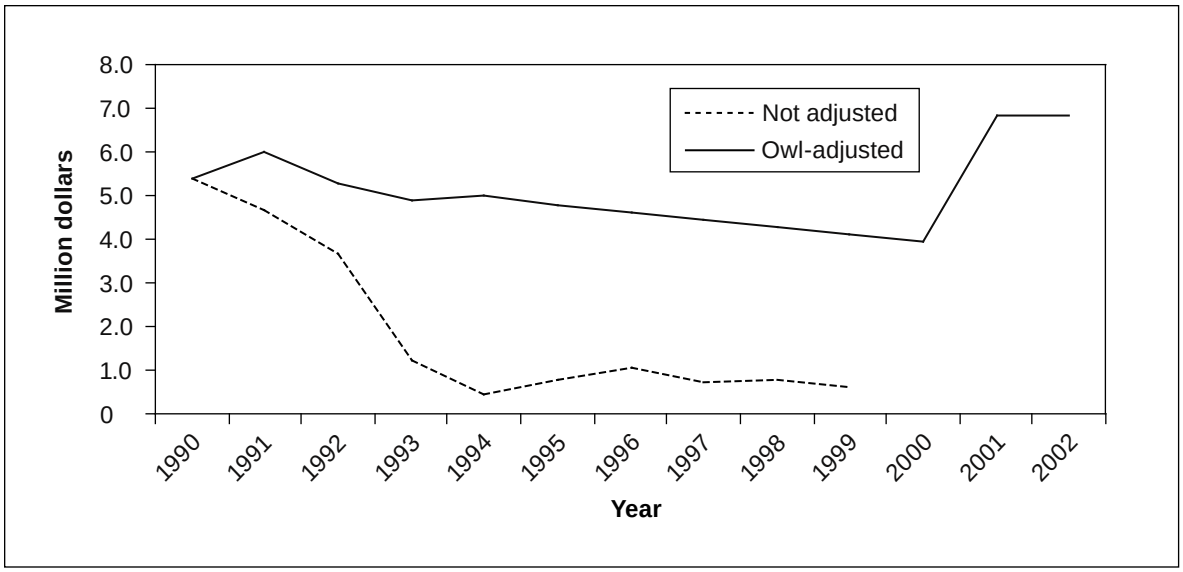

Figure 25—Olympic National Forest payments to county governments, 1990–2002. The lower line represents the amount that county governments would have received based on 25 percent of the Olympic National Forest collection receipts alone, without the mitigating legislation. The upper line indicates the amount of money that county governments actually received under the spotted owl safety net payments and the Secure Rural Schools Act.

lower line on the graph represents the amount that county governments would have received based on 25 percent of the Olympic National Forest 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 more than doubling the revenues. The Secure Rural Schools Act has provided the highest level of payments to counties since 1990. Figure 26 shows how these payments have been distributed among the counties that contain Olympic National Forest lands.

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 Olympic National Forest. There are two RACs on the Olympic Peninsula: the Olympic Peninsula Resource Advisory Committee, which includes Clallam, Jefferson, Mason, and Thurston Counties; and the Grays Harbor RAC, which covers only Grays Harbor County. These RACs serve as an important source of funding for joint forest stewardship projects between the forest and the public. The RAC money not only promotes joint forest stewardship, but also is an important source of new grant money to communities that have seen NEAI funds largely disappear.

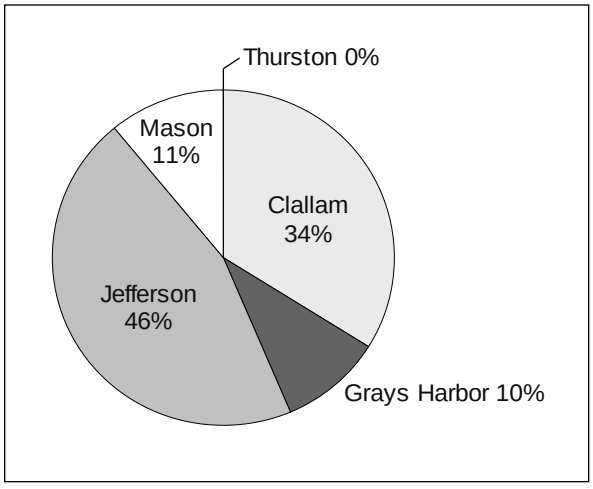

Figure 26—Distribution of Olympic National Forest payments to counties across the five counties that surround the Olympic National Forest.

Chapter 2 Summary

In terms of resource outputs, the most significant change on the Olympic National Forest has been the drop in timber harvest activity from an average of 250 mmbf per year in the 1980s, to an average of 10 mmbf per year since 1990. Associated with that decline was a substantial drop in timber revenue generated by the forest, from over $30 million in 1989 to under $2 million in 2002. Timber was the single biggest driver behind the forest budget prior to the Plan.

The recreation program has remained fairly stable, and revenues generated by the Recreation Fee Demonstration Program have helped raise funds for recreation maintenance and development to meet the growing demand for recreational outputs by the forest.

Two additional 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.

The Forest Service community economic assistance increased substantially between 1994 and 1998 owing to the NEAI. Now that RCA funds have dwindled, economic assistance money available to communities through the forest has essentially returned to pre-Plan levels. However, forest communities have the opportunity to benefit from a new source of funds made available through RAC as part of the Secure Rural Schools and Community Self-Determination Act.

In chapter 3, we examine how these changes on the forest have affected social and economic well-being in three communities around the Olympic National Forest.

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

This section focuses on three case-study communities that are located within a 10-mile radius of the Olympic National Forest. Using quantitative data from the U.S. census, combined with qualitative information from interviews with community stakeholder and local Forest Service employees, we observed (1) how communities around the Olympic National Forest have changed since 1990, and how changes in forest management and the flow of socioeconomic benefits from the forest under the Northwest Forest Plan (the Plan) have contributed to that change; (2) how communities have adapted to change, and the role the forest has played in helping them do so; and (3) changing relationships between the Olympic National Forest and the case-study communities since 1990.

Quilcene

Community Change and the Effects of Forest Management Policy

As mentioned in chapter 1 of this report, the economy of Quilcene was highly dependent on the timber industry, particularly Forest Service timber sales until the early 1990s. The curtailment of logging activity and forest management activities on the Olympic National Forest set in motion the changes in Quilcene prior to the Plan. The Plan has not restored logging activities to levels seen in the 1980s, nor has it restored management activities to the extent that local contractors are getting contracts or sales. One logging company went out of business, and the remaining logging company in the area employs one resident from Quilcene, a tree-faller, and contracts almost exclusively on private lands. As a result of the declines in federal timber sales, the local economy has stagnated, and the community has struggled to adapt to the change and replace the role that the timber industry played in the community. In the vacuum that resulted, residents and county agents reported three primary trends in the 1990s: the outmigration of timber industry workers and their families, the inmigration of three distinct populations who found the newly vacated houses and properties affordable and the community attractive, and the rapid growth of service—particularly leisure—industries. The increase in service industry employment is not reflective of growth in this sector for Quilcene itself, but reflects regional growth in surrounding communities, such as Port Townsend, Bremerton, and Silverdale.

The 1990s marked a period of major economic recession for the community. More recently, however, there is little unanimity about the meaning of social and economic trends in the community. Although respondents generally acknowledged that the area is not doing very well, some report that the area has been and remains stagnant, others believe the area is still in a steady decline, whereas another group believes that the area is rebounding. Typical responses within the different groups in the community are fairly consistent. Many older residents said that the community was in decline. At the same time, many residents who moved into the area in the 1990s perceived conditions more optimistically. On the other hand, people affiliated with natural resource industries usually responded that the area is not doing well but that things have been status quo for some time.

These divergent views can be explained by the varying degree to which different sectors of the local economy and community members have been affected. Census data, interview responses, and researcher observations confirm the uneven effect of the changes in national forest management on the area's change between 1990 and 2000. The following data broadly describe the demographic, social, and economic status and trends in Quilcene and Jefferson County.

Demographic change—

While Jefferson County experienced moderate growth between 1990 and 2000, Quilcene lost more than 20 percent of its population, declining from 478 in 1990 to 375 in 2000 (table 6). Interviewees attribute this loss in population to the outmigration of timber industry workers and their families as well as Forest Service employees after the reduction in logging on the Olympic National Forest.

Table 6—Population, median age, school enrollment, and educational attainment for Quilcene (measured at the census block group aggregate [CBGA] level) and Jefferson County, 1990 and 2000

	1990	2000	Change
			Percent
Total population, Quilcene CBGA	478	375	-21.55
Total population, county	20,146	25,953	28.82
Median age, Quilcene, CBGA	32.1	39.7	23.68
Median age, county	41.1	46.9	14.11
School enrollment, Quilcene CBGA	101	93	-7.92
School enrollment, County	3,292	4,364	32.56
Completed high school, Quilcene CBGA (percent)	78.55	89.10	13.43
Completed high school, county (percent)	82.69	91.57	10.74

Source: U.S. Bureau of the Census 2000.

During the same period, the area's median age increased and school enrollment declined. The median age increased by more than 23 percent, from 32.1 to 39.7 (table 6). The median age of Quilcene's population increased more rapidly than the county's population as a whole, but it remains low compared to 46.9 for Jefferson County. The 45 to 64 age category increased by almost 55 percent in Quilcene, compared with an 85-percent increase for Jefferson County (table 7). All other age categories declined in Quilcene. The 5 to 19 age cohort declined the least, losing 4.8 percent—five individuals. The same age group increased by over 20 percent in Jefferson County. In Quilcene, the causes are threefold: natural aging of the population, an outmigration of younger families, and an inmigration of an older population. When the curtailment of logging activity occurred in the late 1980s and early 1990s, many younger people who were still in their peak earning years left the area to enter retraining programs or get jobs elsewhere. They were a key demographic that supported the local goods and services economy, and school.

Not surprisingly, with changes in the age distribution and the increase in median age in Quilcene, school enrollment declined. Enrollment declined 7.92 percent in Quilcene, whereas enrollment increased 32.56 percent in Jefferson County (table 6). Between 1990 and 2000, educational attainment[22] increased by 13.5 percent, from 78.5 percent to 89.1 percent (table 6). This change is attributable to a change in the area's population rather than a change in the area schools' performances.

Economic change—

The change in population and the shift away from a timber economy has also affected the economic composition of the community. Residents described the community as composed of two distinct populations: those with very high incomes and those with very low incomes. Overall, however, median incomes have increased among Quilcene residents. In 1990, the median household income for Quilcene was $25,378, 80 percent of the county average. In 2000, median

[22] We define "educational attainment" as the number of residents 25 and older that have completed high school or beyond.

Table 7—Age distribution for Quilcene (measured at the census block group aggregate [CBGA] level) and Jefferson County, 1990 and 2000

	Age distribution					
	0 to 4	5 to 19	20 to 29	30 to 44	45 to 64	65 and up
			Number of people			
1990 Quilcene CBGA	29	104	76	126	71	72
2000 Quilcene CBGA	16	99	31	71	110	48
Change (percent)	-44.83	-4.81	-59.21	43.65	54.93	-33.33
1990 county	1,139	3,753	1,562	4,983	4,542	4,167
2000 county	1,051	4,518	1,678	4,834	8,411	5,461
Change (percent)	-7.73	20.38	7.43	-2.99	85.18	31.05

Source: U.S. Bureau of the Census 2000.

household income increased by 58 percent to $40,094, exceeding the county average of $37,869 (table 8). No households earned more than $75,000 annually in 1990, but nearly 18 households reported earnings more than $75,000 in 2000 (table 9).

The percentage of the population living in poverty fell nearly 25 percent, from 19.5 percent in 1990 to 14.9 percent in 2000 (table 8). This represents a more sizable decrease than what took place across the county. However, the percentage of the population living in poverty in Jefferson County stood lower than in Quilcene, at 11.3 percent in 2000.

Table 8—Economic indicators, Quilcene and Jefferson County, 1990 and 2000

	1990[a]	2000	Change
			Percent
Median household income, Quilcene CBGA (dollars)	25,378	40,094	57.98
Median household income, county (dollars)	31,270	37,869	21.10
Poverty, Quilcene CBGA (percent)	19.46	14.93	-23.28
Poverty, county (percent)	13.47	11.26	-16.41
Unemployed, Quilcene CBGA (percent)	20.31	7.14	-64.84
Unemployed, county (percent)	7.17	6.68	-6.83

CBGA = census block group aggregate.
[a] The 1990 median household income has been adjusted for inflation.

Unemployment also dramatically decreased by 64.8 percent from 20.3 percent in 1990 to slightly above 7 percent in 2000 (table 8). Countywide unemployment was at 7.2 percent in 1990 and 6.7 percent in 2000, indicating a marginal shift in unemployment in Jefferson County.

To capture the socioeconomic changes occurring in the communities located within the northern spotted owl region, Sutton and Donoghue (in press) developed an index of socioeconomic well-being. This index was constructed using educational attainment, unemployment, poverty, employment diversity, commuting time, and the household income inequality ratio. In 1990, Quilcene had a score of 46.47 on the socioeconomic well-being index, which placed it in the "very low" category in terms of well-being among the region's communities. By 2000, this index had markedly increased to 64.20, placing Quilcene within the "medium" category.

These statistics suggest that economic conditions have markedly improved in Quilcene. Nevertheless, interviewees noted that a segment of the community continues to live in poverty. One resident noted there were many poor people living in the area, many of whom lived in their cars. Some relied on disability income. Others sold illicit drugs to make a living. Interviewees noted a high incidence of drug (particularly methamphetamine) use in Quilcene. Some felt that those with more education have moved away, while those that have remained have not been able to adapt—entering a cycle of poverty, particularly with a lack of living wage jobs.

Change in employment by industry trends in Quilcene and in Jefferson County also provides some insight into how the economy changed between 1990 and 2000 (table 10). Although it represented a 1.5 percent decline as a percentage of the population employed in these industries,

Table 9—Household income distribution, Quilcene, 1990 and 2000

	Household income distribution[a]								
	<$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
					Number of households				
1990 Quilcene CBGA	26	33	68	30	11	22	0	0	0
2000 Quilcene CBGA	15	9	24	18	27	33	11	3	4
1990 county	1,429	1,029	1,821	1,499	1,504	839	271	177	53
2000 county	1,073	937	1,740	1,650	2,078	2,218	991	636	326

CBGA = census block group aggregate.
[a] These data are not adjusted for inflation and are reported in 1990 dollar values and 2000 dollar values, respectively.

Table 10—Employment by industry, Quilcene, 1990 and 2000

Industry	Number of employees	
	1990 Quilcene CBGA	2000 Quilcene CBGA
Agriculture, forestry, fishing, hunting, and mining	33	35
Construction	5	25
Manufacturing	41	15
Wholesale trade	5	4
Retail trade	9	17
Transportation, warehousing, and utilities	5	17
Finance, insurance, real estate and rental, and leasing	1	6
Education, health, and social services	5	23
Arts, recreation, accommodations and food services	8	17
Public administration	15	6
Professional and other services	26	11
Total	153	176

CBGA = census block group aggregate.

employment in agriculture, forestry, fishing, and mining increased from 33 to 35 individuals. In contrast, employment in manufacturing declined by 68 percent, from 41 people in 1990 to 15 in 2000. Employment in transportation, warehousing, and utilities increased from 5 to 17 individuals between 1990 and 2000. There was a substantial growth in the construction industry, where 25 people reported employment in construction in 2000, compared to only 5 in 1990. There was increased employment in all service industries. Employment in finance and real estate in Quilcene increased from one in 1990 to six in 2000. Employment in education, health and human and other services increased from 5 in 1990 to 23 in 2000. Both finance and real estate and arts and entertainment based employment are reflective of countywide trends (i.e., an active real estate market, increases in tourism, and a larger presence of an older nonworking population). One area resident noted that the local real estate market was flat in the early 1990s but that it picked up substantially late in the decade. Beyond real estate and finance, and construction, employment trends in Quilcene are not indicative of the development of new industries but rather reveal the extent to which Quilcene is a bedroom community.

Key social and economic changes—

There have been a number of different types of individuals drawn to the area by low housing costs, inexpensive land, and its location in proximity to urban areas on the other side of Hood Canal. Many people noted that Quilcene is an inexpensive place to live. Residents variously said that "people come to Quilcene because they can afford to" or that Quilcene is the "last cheap place to buy [land]." Without exception residents are cognizant of the shift from a dependence on natural resource-based industries, to more of a bedroom and retirement lifestyle community.

To an extent, Quilcene is a bedroom community. A sizable number of the population lives in Quilcene and travels to work in the larger cities of Port Townsend, Bremerton, and Silverdale. Many of the people who commute to work bought property in Quilcene because it is relatively inexpensive, close to employment centers, and because of the area's scenic beauty. Inmigrants were generally of two types, professionals who moved in from the Seattle area, and service industry workers buying the cheaper housing stock left by the timber workers who left the community in the late 1980s and early 1990s.

Although some of the recent higher income immigrants bought homes and commute to work, a number

bought land and built homes either as investments or for future retirement. One county agent, when reflecting on the median age and income distribution, remarked on the number of wealthy people moving into the area.

Some view the new landowners, especially the second-home owners and retirees, as an important component of Quilcene's local economy. Indeed, several area residents commented on who was moving into the area and made several observations about their impacts, including bringing in a sense of optimism and entrepreneurship. Many of the recent immigrants were thought to be highly educated and affluent retirees. County agents, local residents, and area business people view the immigrants as outsiders but see them having positive impacts on the community. Some complain that many of the commuters do not invest or spend money in the community. The loss of basic local goods and service businesses are a testament to this claim. However, the growth of the service industries and employment in construction point to fairly substantial financial impacts.

There is a population of immigrants that is not affluent. A number of immigrants who moved to Quilcene were taking advantage of low-cost real estate left behind by the residents who left in the wake of the timber industry's downturn in the late 1980s and early 1990s. Whether the lower income population commutes or is employed locally is unclear. One long-time resident commented on the change in population and the appearance of the community, stating that many nice homes were sold to people who are letting them run down.

Business trends in the community mirror the changes in composition of the community: some businesses are doing well, some are just getting by, and many have closed. Many businesses that had been in the community for years have closed including a gas station, grocery store, and restaurant. On the other hand, there has been an increase in other small businesses over the past several years, many of which are tourism related. There are also four small organic farms in the area that have started up within the last 10 years.

Community Adaptation to Change

Factors promoting adaptation to change—A segment of the community has made efforts to adapt to changing circumstances. Purposeful and significant strategies have been undertaken by individuals, local entities, including the school, and outside organizations. These strategies included small business startups, community planning activities, and infrastructure development. In the end, however, the change in composition of the local population—the out- and in-migration, and the resulting changes in the local economy have had the most direct and lasting impacts on the community's ability to adapt to changing circumstances and social and economic conditions.

Several residents identified the efforts of various agencies that worked in Quilcene to mitigate some of the negative results of the loss of timber industry jobs. Social service agencies, such as Olympic Community Action and United Good Neighbors, provide access to a number of programs including Head Start and heating assistance programs. Olympic Community Action was contracted by Jefferson County to manage the community center in Quilcene. The Quilcene Community Center, in turn, is a facility that provides a meeting place for various organizations such as Veterans of Foreign Wars, the Lion's Club, and the 4-H Club, as well as providing space for the area's food bank. Staff at the community center provide referrals to residents who need the services provided by Olympic Community Action. In addition, the school district pursued and received grant funds, most notably from the Gates Foundation.

County agents and Quilcene residents both noted that the small business development efforts made by individuals were an important component of the community's ability to adapt to the changing circumstances. Although much of the entrepreneurial activity has been taken on by recent inmigrants to the community, long-time residents have initiated some.

Finally, residents noted that there were a number of community meetings over the past 5 to 10 years to address issues specifically addressing needs resulting from changing social and economic conditions. Several residents

recalled meetings for expanding the community center and the subsequent planning activities. Nearly all residents and county agents recalled community meetings held to address a community water system. The water system was intended to facilitate economic development in the downtown. The meetings drew a range of individuals, including long-time residents, business owners, the Forest Service, and Jefferson County agents.

Despite the numerous strategies employed by residents in the community and outside entities, Quilcene has not had much success adapting to change. There have been some successes with programs serving specific needs in the community, such as services provided by the Olympic Community Action Program. Many residents do not see that the community has done anything to adapt to changing circumstances and attribute it to the lack of cohesion within the community. Paradoxically, the very cause of the lack of cohesion—the change in population—has also been key in spurring positive change in the community. Most notable has been the financial investment made through entrepreneurial activities of many recent immigrants.

Factors preventing adaptation to change— The ability of residents of Quilcene to adapt to the socioeconomic changes that have taken place owing to the reduction in federal timber harvesting has been mixed. As mentioned above, many individuals employed in the timber industry found work elsewhere or moved on to new careers. For the community as a whole, however, residents and county officials who were interviewed identified several significant factors that contributed to the area's continued lack of ability to adapt to the changes resulting from loss of timber-related jobs. The main factors identified included lack of cohesion in the community, lack of physical infrastructure, land use regulations imposed by Washington's Growth Management Act, and acts of nature.

Nearly all residents and county officials remarked on the lack of cohesion and insular attitude found in Quilcene. Generally, they expressed a negative view of the community's "personality," including the community's fear of government and outsiders, a culture of victimization, and attitude of hopelessness. One interviewee felt that the bipolar income distribution characterized the two very different populations, and the difficulty in getting them to agree on anything. After struggling for nearly 10 years to change and reestablish itself, the community has changed little. What successes have been achieved are more a result of the change in the composition of the community and have less to do with any intention of community effort.

However, county and state regulations have also imposed significant barriers that affect the community's ability to adapt to new social and economic conditions. The most significant according to local residents is the lack of infrastructure, including the lack of a sewer and public water system. The physical infrastructure is an obstacle to any significant industrial development and more intensive commercial development in the downtown. Efforts to develop the community's water system have been the subject of intense local debate since at least 1994. In the end, the water system has not been developed because of the community's inability to agree on the need for the system and support for its development.[23]

Another significant barrier to change identified by area residents is Washington's Growth Management Act. Washington enacted the Growth Management Act (GMA) of 1990 to channel growth into incorporated areas or areas readily served by infrastructure. In Jefferson County, there was practically no zoning prior to 1990. Then in 1991, there were restrictions on commercial development outside incorporated areas. The county also established designations for resource lands and minimum 5-acre lots in rural areas. The planning process took several years, concluding in 1998. The process was very contentious and took place at the same time as the spotted owl (*Strix occidentalis caurina*) issues were affecting national forest use and regulations. Many residents believe the act has been applied "very stringently" to Quilcene. Most residents believe the GMA has made development more difficult because it has limited subdivision and commercial zoning. One area business

[23] Since the interviews for this report were conducted, there has been action affecting the development of the water system. The State Department of Ecology reversed a prior decision and effectively enabled the development of a water system by the Jefferson County Public Utility District No. 1.

owner commented that if the water infrastructure were in place, the restrictions placed on development by the GMA would be lessened.

Finally, one factor that has contributed to the area's struggles has been natural climatic events. Heavy rains in the late 1990s and early 2000s caused landslides that temporarily closed Highway 101, cutting off access to Quilcene from the south, and closing Dosewallips Road, a popular and unique point of departure into the Olympic National Forest, Buckhorn Wilderness, and Olympic National Park. The results of the road closures has been reduced tourist traffic and reduced sales at local businesses.

The Role of the U.S. Forest Service in Helping to Adapt to Change

The Forest Service's direct and indirect contributions to the community are far fewer and much less important to Quilcene than in the past. Historically, the Forest Service played a central role in the work, recreation, social, and economic life of the community. The Forest Service does maintain a staff in Quilcene at the Quilcene Ranger Station. The Forest Service also provides grants to Jefferson County and the community to support community development efforts, and offers educational programs for local youth. The following describes these efforts in greater detail:

Grants—
Forest Service records indicate that the community received $25,000 in 1994 to explore the possibility of developing a water system in Quilcene. The water system belongs to the Forest Service, and they have been looking for mechanisms to transfer the system to the community. Most residents and county agents were familiar with the grant and recall the effort with a great deal of disillusionment.

Residents recalled various projects that may or may not have been funded by the Forest Service, including funding to write a community plan and to expand the community center. Several residents noted grants were awarded to organizations like the Resource and Conservation District for habitat restoration and demonstration projects but no specific records were found. Most of these projects related to the 1998 Salmon Recovery Act that channeled funds to support the development and management of collaborative efforts.

Other programs—
Several people noted that although part-time summer positions with the Forest Service were scarce, there were still programs to get local youth involved in forest-related activities. One person referred to the Youth Ranger Corps, a program organized for 12- and 13-year-olds to do trail maintenance in the summer. The program received funds through the Olympic Resource Advisory Council (RAC) in 2003.

However, most area residents had little awareness of Forest Service programs, and they appear to have done little to help Quilcene adapt to changes brought about by changing federal forest management policies.

Changing Relations Between Quilcene and the Olympic National Forest

The Forest Service played a relatively small role in Quilcene's efforts to adapt to the shift away from timber dependency. There is a growing disconnect between the Forest Service and the community as the economic relationship with the Forest Service and cultural relationship with the national forest lessens. Individuals and businesses that once relied on the Forest Service for their livelihoods have either left the area or are pursuing other activities to support themselves. Institutions that once relied on Forest Service funds or resources now look elsewhere for support. Individuals who have moved into the area over the past 10 years tend not to use the forest for economic purposes or do not rely otherwise on the Forest Service. Although the Forest Service has tried to support local efforts to adapt to the new economic and social realities through grants, contracts, sales, employment, and other programs, these efforts have not amounted to much in the eyes of area residents. Because many local entrepreneurs are focusing on tourism development, there is still a need and interest in working with the Forest Service.

Many residents felt that the local Forest Service was caught between the community and the federal bureaucracy. They were cognizant of the staff cutbacks, budget constraints, and "red tape" that employees had to cut through to get their work done. Many felt that local Forest Service employees make a great effort to be part of the community, are supportive of the school system and the chamber of commerce, and make important contributions to the quality of life in the community. The loss of Forest Service employees owing to downsizing and outsourcing has been a great loss to the community. Many residents noted how the reduction in Forest Service staff in Quilcene negatively affected the volunteer base, affecting such institutions as the volunteer fire department.

Lake Quinault Area

Community Change and the Effects of Forest Management Policy

Demographic change—

The population for the Lake Quinault communities declined by 12 percent between 1990 and 2000, from 705 to 622 (table 11). This is in contrast to the 5-percent increase for Grays Harbor County. Most residents stated that there had been an outmigration of timber workers and their families from the area in the late 1980s and early 1990s.

The median age of residents has also increased by 17 percent, from 33 to 39, which supports the observation that younger working families have left the area, and older residents have remained (table 11). For the county, the median age increased by 9 percent. The change in age distribution further supports the observed trend, with decreases in the age categories between 0 to 44 as well as 65 and older (table 12). Only the age range from 45 to 64 showed an increase: 37-percent increase, from 142 to 194. One explanation is that the middle-aged group was established in the area and could continue to make a living, whereas the younger aged groups (perhaps those with fewer assets or options for making a living) were forced to leave. Similar declines in the 20- to 44-age categories, and the 0- to 4-age category were observed for the county (which was also undergoing economic hardship owing to declines in the timber economy). The county similarly showed growth in the 45- to 64-age category, while the 65-and-over population remained relatively stable.

Census data also show that not only is the population getting older but is more educated (table 11). In 1990, 74 percent of the population had completed high school, whereas in 2000 the percentage of the population to complete high school had increased to 78 percent. The percentage of people with bachelor's degrees or higher, however,

Table 11—Population, age, school enrollment, and educational attainment for the Lake Quinault (measured at the census block group aggregate [CBGA] level), and Grays Harbor County, 1990 and 2000

	1990	2000	Change
			Percent
Total population, Lake Quinault CBGA	705	622	-11.77
Total population, county	64,175	67,194	4.70
Median age, Lake Quinault CBGA	33	38.7	17.27
Median age, county	35.3	38.6	9.35
School enrollment, Lake Quinault CBGA	169	170	0.59
School enrollment, county	12,755	14,390	12.82
Completed high school, Lake Quinault CBGA (percent)	74.09	78.72	6.25
Completed high school, county (percent)	73.97	81.09	9.63
Bachelor of arts, graduate, professional degrees, Quinault-Neilton CBGA (percent)	8.64	12.60	45.83
Bachelor of arts, graduate, professional degrees, county (percent)	10.97	12.66	15.41

Source: U.S. Bureau of the Census 2000.

Table 12—Age distribution, Lake Quinault and Grays Harbor County, 1990 and 2000

	Age distribution					
	0 to 4	**5 to 19**	**20 to 29**	**30 to 44**	**45 to 64**	**65 and up**
			Number of people			
1990 Lake Quinault CBGA	61	176	82	172	142	72
2000 Lake Quinault CBGA	24	169	55	121	194	59
Change (percent)	-60.66	-3.98	-32.93	-29.65	36.62	-18.06
1990 county	4,722	14,171	7,813	14,787	12,492	10,190
2000 county	4,239	14,833	7,130	13,784	16,876	10,332
Change (percent)	-10.23	4.67	-8.74	-6.78	35.09	1.39

Source: U.S. Bureau of the Census 2000.
CBGA = census block group aggregate.

was relatively low: 9 percent in 1990 and 13 percent in 2000. Similar statistics were found for the county.

Despite the decline in population, school enrollment was the same in 1990 and 2000 (169 and 170, respectively) (table 11). Residents of the area, however, say that enrollment actually declined dramatically in the early 1990s, owing to the outmigration of many families from the area. The apparent stability of school enrollment can be explained by the growth of the Latino population in the area during the late 1990s. The Hispanic population increased from 0 to 6 percent between 1990 and 2000 as compared to from 2 to about 5 percent for the county. Interviews with those affiliated with the school district indicate that the increase in Latino children attending the local school has been an important factor in maintaining the stability of school enrollment. Although school enrollment has been stable for the Lake Quinault area, it is interesting to note that for the county, it has increased by 13 percent.

The Native American population also showed an increase from 1 to 46 between 1990 and 2000. Overall, the racial composition of the area, although still predominantly white, was more diverse in 2000 (table 13).

Economic change—

According to census data, the economic situation for residents of Lake Quinault improved between 1990 and 2000. Median household income increased by 30 percent, from $27,507 to $35,893 per year (table 14), slightly higher than the county average, which increased from $28,596 in 1990 to $34,160 in 2000. Some interviewees felt that the increase in median household income could be attributed to demographic changes in the community—that is, families that owned land could afford to stay in the community, whereas

Table 13—Population by race, Lake Quinault and Grays Harbor County, 1990 and 2000

	Population by race[a]					
	Caucasian	**African American**	**Native American**	**Asian and Pacific Islands**	**Other**	**2+ races (2000 only)**
			Number of people			
1990 Lake Quinault CBGA	700	0	1	4	0	
2000 Lake Quinault CBGA	547	0	46	2	13	14
1990 county	60,308	45	2,665	740	417	
2000 county	59,544	172	3,325	762	1,313	2,078

CBGA = census block group aggregate.

[a] The race question was changed in the 2000 census to allow individuals to choose two or more races, whereas in 1990 they were only allowed to choose one race. Hence, some individuals choose a particular race in 1990 and then in 2000 choose two or more races (see 2+ races 2000 only column). No percentage change was calculated for population by race owing to this change

working class logging families were forced to move away. Others felt that the increase in income was due to the higher percentage of government employees (i.e., Forest Service, Park Service, state (Washington Department of Natural Resources, Washington Department of Transportation), county, and school district), who were eligible to receive cost-of-living salary increases. Some felt that economic conditions were actually worse, and that census figures were incorrect or under-reported, (particularly for the Latino and Native American populations).

The percentage of people living in poverty decreased from 18 to 16 percent, though it remained relatively high (table 14). The poverty rate was similar for the county in 2000. Household income distribution shifted upward, with 80 households making $50,000 or more per year in 2000, compared to 36 in 1990 (table 15). Those making $10,000 or less decreased from 43 to 24, and those making $15,000 to $24,999 decreased from 82 to 40. This shift in household income distribution further suggests that the population of the area has changed (i.e., poorer households moving away, and wealthier ones remaining or moving in), rather than an increase in income for the same individuals over time. Interestingly, unemployment increased from 6.8 percent to 7.2 percent for the community, whereas it decreased for the county (table 14).

Interestingly, Donoghue and Sutton's (2006) socioeconomic well-being index showed very little change in socioeconomic well-being between 1990 and 2000. In 1990, the Lake Quinault census block group aggregate (BGA) ranked among communities in the "low" category of socioeconomic well-being, with a score of 59.33. In 2000, the area remained in the "low" category, with a score of 60.03. Most interviewees felt that this lack of change in socioeconomic well-being was more reflective of the actual situation in the community.

The types of jobs that people are employed in have also changed (table 16). Interestingly, employment in agriculture, forestry, fishing, and mining remained steady. The number employed in construction, manufacturing, and retail trade declined between 1990 and 2000. Jobs in transportation and utilities, wholesale trade, services (i.e., arts, recreation, accommodation, and food services), health and education, and public administration increased during this period.

Key social and economic changes—
Based on interviews with community members, some key social and economic changes that have taken place in the Lake Quinault area include the following:

***Shift in population*—**Residents felt that the population of the community had changed over the past 10 years. This change was due partly to an outmigration of loggers and other timber workers from the area owing to the decline in the industry. Neilton, in particular, housed many loggers and was heavily affected by the loss of timber industry jobs.

The Forest Service downsizing and district consolidations also resulted in the loss of Forest Service employees from the community. In the late 1980s, the Quinault office had 65 full-time employees and over 150 seasonal/part-time employees. Currently, there are 13 employees stationed at Quinault.

At the same time, there has been an inmigration of Latinos into the community. Initially, many came to work as tree planters, and more currently work in precommercial tree thinning, the cedar shake

Table 14—Economic indicators, Lake Quinault and Grays Harbor County, 1990 and 2000

	1990[a]	2000	Change
			Percent
Median household income, Lake Quinault CBGA (dollars)	27,507	35,893	30.49
Median household income, county (dollars)	28,596	34,160	19.46
Unemployed, Lake Quinault CBGA (percent)	6.81	7.22	6.02
Unemployed, county (percent)	9.31	8.32	-10.63
Poverty, Lake Quinault CBGA (percent)	18.30	16.01	-12.51
Poverty, county (percent)	16.37	16.10	-1.65

CBGA = census block group aggregate.
[a] The 1990 median household income has been adjusted for inflation.

Table 15—Household income distribution, Lake Quinault and Grays Harbor County, 1990 and 2000

	Household income distribution[a]								
	<$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
	Number of households								
1990 Lake Quinault CBGA	43	30	82	36	46	28	3	3	2
2000 Lake Quinault CBGA	24	20	40	35	46	41	23	13	3
1990 county	5,156	3,216	5,254	4,086	4,416	2,512	511	264	188
2000 county	3,260	2,389	4,128	3,916	4,921	4,883	1,951	984	375

CBGA = census block group aggregate.

[a] These data are not adjusted for inflation and are reported in 1990 dollar values and 2000 dollar values, respectively.

Table 16—Employment by industry, Lake Quinault, 1990 and 2000

	Number of employees	
Industry	1990 Lake Quinault CBGA	2000 Lake Quinault CBGA
Agriculture, forestry, fishing, hunting, and mining	37	38
Construction	19	9
Manufacturing	92	45
Wholesale trade	1	11
Retail trade	40	28
Transportation, warehousing, and utilities	7	21
Finance, insurance, real estate and rental, and leasing	1	3
Education, health, and social services	29	53
Arts, recreation, accommodations, and food services	23	43
Public administration	13	19
Professional and other services	39	21
Total	301	292

CBGA = census block group aggregate.

and shingle industry (as bolt cutters, and in shake mills), and brush picking for the floral greens industry. These types of jobs are highly labor-intensive, and generally offer few, if any, fringe benefits, making them unattractive to locals. The growth in the Latino population has been important in keeping school enrollment at a stable level, as well as providing business to local stores and gas stations.

***Lack of private land for residential and commercial development*—**Many residents felt that the lack of private land in the area was a major constraint in terms of attracting more residents to the area or creating new possibilities for economic development. The communities are surrounded by federal, state, tribal, and private industrial timberlands, with little private land available for housing and other development. Interviewees felt the community was suffering from a housing shortage, particularly for people such as school teachers, who often commute to work from Aberdeen/Hoquiam. Many of the trailer homes and lower cost homes that housed loggers and their families in the past have been destroyed. Some were bitter toward the National Park Service, which has been purchasing many of the homes on the north shore of the lake to return the land to wilderness.

***Shift in economic base*—**The economic base of the community has also changed over the past 10 years. In the 1980s, the local economy was highly dependent on timber, and at least two to three mills in the local area were highly dependent on timber from the Olympic National Forest.

The cedar shakes industry was particularly important. In the mid-1980s, residents estimate that about 15 shake mills were in operation in the local area. Today, about six remain. "There used to be a shake mill every 100 feet along Highway 101," describes one resident. In the 1970s and early to mid-1980s, the Forest Service had large cedar block sales, as well as salvage sales, which fed the numerous shake mills in the area. Many small mill owners are struggling to keep their businesses viable, and fewer jobs are available overall. One interviewee states, "The standard of living has dropped considerably compared to the early to mid-1970s. People are making less money. Cedar mills are not making any more money than they did 20 years ago, nor are people who work in the woods."

The impact of the curtailment of logging on the Olympic National Forest was felt disproportionately more by the small- to mid-size timber companies and related businesses in the local area. Many of the smaller companies relied on up to 50 to 75 percent of their timber to come from the national forest. Some mills that processed Forest Service timber in the Aberdeen/Hoquiam area also suffered. The decline in the timber economy, in turn, affected other local business such as stores and gas stations, as well as the school.

A growing segment of the population is employed in the service industry, specifically recreation tourism. "One of the reasons there is a community is because of tourism. If it wasn't for the lake and the beauty of the area, there wouldn't be a community here," said one interviewee. The number of visitors to the Quinault Ranger Station increased from about 600 in the mid-1990s to 1,000 in 2003. The majority of local jobs are in the hotel industry, with the Quinault Lodge being the largest employer (with about 150 employees). Some people feel, however, that since the lodge was purchased by Aramark Corporation, a large national corporation based in Philadelphia, its ties to the community have somewhat diminished. Nevertheless, the lodge still supports community events, donating gift certificates for raffles, free dinners, etc. A few other resorts and motels surround the lake. Some residents started guiding operations, taking visitors fishing and boating on the lake. Many of the local grocery stores and gas stations depend on tourism to survive.

Employment in tourism, however, is highly seasonal. Hotels are generally at maximum capacity during summer, and occupancy is low in the winter. Salaries for hotel employees are also relatively low compared to those in timber industry jobs.

One explanation for the increase in income for the area is a higher proportion of government employees. Although the number of Forest Service employees has declined for the area, government jobs still account for a large proportion of the local jobs. For example, the Lake Quinault School District is the second largest employer in the area, with about 100 employees. Other government employers include the Forest Service, the National Park Service, Washington Department of Natural Resources, the Quinault Indian Nation, and Grays Harbor County.

There is also a segment of the population that commutes, particularly to Aberdeen/Hoquiam or other parts of the peninsula. Most professional-level jobs are in these larger communities.

Retirees make up yet another group of residents. Many retirees have lived in the community all their lives, whereas a smaller proportion has moved to the area more recently. Many of the old timers used to raise cattle to supplement their retirement income, although for the past 20 years, this has become less common. Compared to other communities on the Olympic Peninsula that have experienced a large influx of retirees, the Lake Quinault area has yet to become a destination for retirees.

Finally, employment in the wild floral greens industry has been increasing over the past 10 years. The Latino population has been the primary source of labor for this industry, working in brush harvesting, transporting, and other postharvest preparation. Some residents mentioned that a large segment of the brush pickers are from Hoquiam and make daily trips up the peninsula. Large, multinational companies based in Shelton ultimately purchase the brush, which is often exported abroad or distributed across the Nation to florists. Although many of the harvesters purchase brush picking permits from the Forest Service as well as

with the state Department of Natural Resources and private landowners, there is also a growing problem with theft of floral greens.

***Shift in community capacity*—**Many interviewees noted that the economic and demographic changes to the community have had a detrimental effect on community capacity. We use the term "community capacity" as consisting of the physical, financial, human, cultural, and social capital of a community (Kusel 1996).[24] In the 1980s, the school, for example, had an active Parent-Teacher Association (PTA), a large number of volunteers, including "room mothers" (mothers that would volunteer to help teachers in the classrooms). Today, the level of volunteerism in the schools is low, with both parents often having to work to survive. One interviewee affiliated with the school felt that many of the parents also do not feel comfortable at the school or do not feel they could adequately be of help. At the same time, the school faces greater demands for supplemental programs and services, such as remedial programs, special education classes, and before- and after-school reading programs.[25]

Much of this loss of capacity is due to the general outmigration of residents, particularly Forest Service employees and their families. As logging came to a standstill and management priorities changed, the timber and roads programs for the Olympic National Forest (which historically were the largest programs), faced dramatic cuts in their budget and staff, resulting in the downsizing of Forest Service staff, as well as district consolidations. Many Forest Service employees and their spouses and other family members were active in community affairs, service clubs, volunteer fire department, and the school (e.g., PTA). Many took on leadership positions in the community.

The loss of timber industry workers and their families also contributed to the drain in social capital. Many of these workers were also active in community affairs, members of the volunteer fire department, service clubs, etc. Family wage jobs in the timber industry gave workers a certain level of leisure time that enabled them to participate in community activities. It also allowed spouses to stay at home with the children and play an active role in the school and community.

One positive effect on the community's capacity is the increase in the percentage of students completing high school. In the past, many students dropped out of school because they were able to get well-paying jobs in the timber industry. Because of fewer jobs possibilities, students are encouraged to finish school, and pursue higher education. Unfortunately, there are few positions for college graduates in the area, and many who leave to go to college are unable to return owing to the lack of local jobs.

***Lack of a tax base*—**Because the majority of land surrounding the three communities is either under federal, state, or tribal ownership, some residents mentioned their concern over the lack of a tax base to support the school and other infrastructure needs in the community. The transfer of private homes along the north shore of the lake over to the national park has further reduced the income to the school through taxes.

Adaptation to Change and the Role of Forest Service Assistance

The community's ability to adapt to these changes has been mixed. A segment of the population continues to try to make a living in the timber industry, although many have had to substantially downsize their operations. One interviewee involved in the timber industry was down to 3 employees, compared to 30 that he employed in the 1980s. Other shake mills simply went out of business. Many people involved in the timber industry are resigned to the fact that they cannot depend on Forest Service

[24] More detailed descriptions of the five types of "capital" that comprise community capacity are as follows: (1) **physical capital** is the physical infrastructure of a community (e.g., sewer systems, business parks, capital assets such as equipment, housing, and schools); (2) **financial capital** is the money, credit, and other financial resources available for local use; (3) **human capital** is the skills, education, experiences, and general abilities and capabilities of residents; (4) **cultural capital** is the myths, beliefs, norms, and lifeways that serve to organize groups and facilitate survival; and (5) **social capital** is the willingness of residents to work together toward community goals (and not just self-interested goals) (Kusel 1996).

[25] Studies have shown that student performance in school is associated with social capital: with a higher level of performance found in communities with greater social capital (Lee, R.G. September 2005. Personal communication. R.G. Lee, Professor of Forest Sociology, College of Forest Resources, University of Washington, P.O. Box 352100, Seattle, WA 98195-2100). boblee@u.washington.edu.

timber for their livelihoods. Some were able to obtain jobs with the large private timber companies, or shift their work to private land. The Quinault Indian Nation has also been an employer in the region. Although the tribe has a policy of Indian preference when hiring, some nontribal people were able to find work with the tribe. When the local Forest Service office began to downsize, some of the staff were also able to get jobs with the tribe.

A few residents have shifted to tourism, working as fishing guides, opening up a small golf course, or selling outdoor gear and equipment. Three general stores in the area cater to both tourists and locals, as well as three or four restaurants. When asked if tourism was important for the community, one interviewee said, "It's probably their lifeblood right now. Especially those businesses right here along this side of the lake…. We have the lake to draw the people here, so that's a good thing."

Despite the high number of visitors to the area, there are relatively few retail establishments aimed specifically at tourists. One explanation for this is that many of the resorts have their own restaurants and gift shops, as well as guide services. Most visitors to the area either stay in these resorts and eat and shop at the resort, or camp and bring their own food. The tourists that come to the area also remain segregated from the local residents. For example, the restaurant at the Quinault Lodge caters almost exclusively to the tourists.

Some interviewees mentioned that there has been some resistance by the community to become exclusively a tourist community, owing to the seasonality of work, low wages of service sector jobs, as well as the differences in values between many tourists and locals. For example, many visitors come to the area for its natural beauty and do not like to look at forests that have been clearcut. Those in the timber industry often feel criminalized by tourists with more preservationist values. Many residents resent the National Park Service for eliminating the homes on the north shore of the lake. Some worry that the national-park-style management will soon extend to the national forest, further restricting extraction-related activities in the area. Nevertheless, many interviewees feel that tourism has helped keep the community alive.

One segment of the community has taken a more proactive approach to these changes through community organization, planning, and development. As economic conditions declined in the mid-1980s, community members felt they needed a stronger voice in government. With assistance from the county and the Forest Service, the community formed the Lake Quinault Community Action Forum, a nonprofit economic and community development group. The forum received a $5,000 grant from the Forest Service to develop a community economic revitalization plan. Some accomplishments since then include eliminating the toll charge for phone calls to Aberdeen, cleaning up the Amanda Park area to help promote tourism, working with the National Park Service and the Youth Conservation Corps to clean up the park trails. The forum also worked with the National Park Service and the county tourism board to help market and promote the Quinault Rain Forest as a destination area. A segment of the road around Lake Quinault had washed out and was left in disrepair for about 6 years, preventing visitors from being able to take the scenic drive around the lake. The forum, working with their state senator, was able to secure $750,000 to repair and pave the road. The forum also worked with the county to change some of the zoning regulations. A more recent project has been the development of a historic museum.

Factors promoting adaptation to change—
The individuals that had been working in the timber industry prior to the spotted owl injunctions and the Northwest Forest Plan have "adapted" to these socioeconomic changes by using various approaches. Some left the community either to continue to work in the timber industry someplace else (e.g., Alaska), or to find other jobs in other sectors (e.g., construction, transportation). Others remained in the community but found work in other fields (e.g., working at the resorts, school, the Quinault Indian Nation). A third group of timber workers continue to operate but may have downsized or diversified in their work. For example, one contractor now extracts downed cedar logs from private land for shakes, but also works on road decommissioning and other restoration work on the national forest. One factor that has helped sustain a timber economy in the area, albeit

a much smaller one than in the past, is the presence of other private, state, and tribal forest lands that continue to provide a supply of timber.

The existence of the Quinault Lodge and other resorts and hotels, the school, and Forest Service contracts have been important factors in the ability of the Quinault community to provide local jobs. Many interviewees felt that the Quinault Lodge has served as somewhat of a buffer for the community by providing stable (albeit seasonal) jobs. Apart from providing jobs, the Quinault Lodge has also been important in providing other amenities to community members. It offers its swimming pool for use by community members and donates funds to help the local school. In 1999, one long-term resident and lodge employee organized a dance and dinner at the Quinault Lodge for community members as a way of bringing the community together. The lodge closed its doors to outside visitors and charged $19.99 for rooms and dinner and $1.99 for drinks. Since then, the dance has become an annual event.

The ability for those that remain in the community to come together to help one another and organize around issues such as the forum, speaks to the level of capacity that still remains. Many people mentioned that the people that remained in the community are the old-timers, and many are the descendents of some of the original pioneer families. They are the people with strong roots in the community, and they are the ones that remain highly involved in community affairs. Many of those people that were interviewed sit on several committees, are involved in service clubs, the school board, the forum, etc.

Factors preventing adaptation to change—
Although the spirit of the remaining residents remains strong, most people admitted that the community continues to suffer economically. Some of the factors that have prevented the community from moving forward include the loss of many of its residents over the past 15 years. The loss of Forest Service employees in particular has been noteworthy, in that they generally represented people with stable incomes, education, and active involvement in the community.

Some interviewees felt that the strong timber culture of the area has prevented the community from embracing and promoting tourism to a greater extent. Some complained that the forum has become somewhat exclusive, excluding those whose ideas or values may not match the majority.

The Role of the U.S. Forest Service in Helping to Adapt to Change

Contracting—
Since the inception of the Plan, the Quinault District has awarded contracts for heavy construction work, such as culvert installation, construction of trail bridges, road decommissioning, and road stabilization. Five of the seven projects funded over the past 5 years were flood damage projects, one was a trail bridge replacement project, and one was a road decommissioning project. The storm events in the late 1990s and early 2000s have kept the number of contracts up. Without the flood work, sources say that there would have been a large decline in contracts for the area. "I can tell you that we rely heavily on these RFL [flood work] contracts...we got hit heavily over a 5- or 6-year period with storms. We haven't had any storms in the past couple of years, so our contracts are going to go way down, because most of it's repaired now."

When asked if contractors were able to survive solely on Forest Service contracts, respondents said no. This was due to the lack of contracts available, as well as the very short work season for Forest Service contacts. The work season is officially from July 16 to October 15 (and sometimes extended in October if the weather is dry), but can be as short as 2 months. "We get to go to work mid-July, but ordinarily it's August 6 that we can start up any contracts because of noise issues and the murrelet and the spotted owl. And they do the fisheries restrictions, [so] we can't work in any water after September 30, so basically we have August and September," said one interviewee. Other restrictions include the hours of day that work can be carried out. "You can't start until 2 hours after sunrise, and have to quit 2 hours before sunset. So if they can't work from dawn 'til dusk, and then they can only work from August through September, and then you have the fisheries shutdown…." Because of the short work window, many contracts take

multiple years to complete. One contractor relied on the Forest Service contracts for only about 25 to 30 percent of his income, owing to the short season of work.

Three contractors living in the local area have been successful at obtaining contracts with the Forest Service for ecosystem management work. Other contractors came either from other parts of the Olympic Peninsula or the Interstate-5 corridor. According to interviewees, local preference did exist as a criterion for awarding contracts. For projects over $100,000, a pool of 20 contractors was selected for multiaward contracts over a 5-year period. This limited pool of contractors was part of a program called Hub Zone Certification (which limited contracts to those coming from depressed timber communities). Contracts under $100,000 are open to anyone.

One local contractor who had been working with the Forest Service for the past 12 years said that his business was doing well because he was able to get in early. He said newer contractors are struggling more. "[In the beginning,] road decommission was difficult to bid on because nobody knew how to do it. But I was able to get experience by getting some of the first bids. It was also new for the Forest Service back then, so we worked together. We went by trial and error."

One interviewee mentioned that the paperwork involved with the federal government can be intimidating for contractors, particularly those with little experience working on government contracts. Nonetheless, this contractor said that he would prefer to work with the federal government rather than with private companies:

> Their [Forest Service] contracts protect you versus private contracts that protect the private company only. With the feds, if you run into something unforeseen, there is money for it. They will pay for it. The private sector will bid anyone out of it. The feds are not allowed to try to pressure you to do things outside of the contract. With the private sector, you run into that a lot. I did a lot of road building for logging companies in the past. If you ran into a problem sometimes you don't make a profit.

When asked about the Jobs-in-the-Woods training program, most interviewees said that there was some activity early on in the Plan, but ultimately, no new contractors were created.

In terms of precommercial thinning contracts, the forest has developed some contracts with the Quinault Indian Nation, funded through the RAC. Latino crews carry out much of the thinning work.

Jobs with the Forest Service—
As a result of budget cuts, agency downsizing, and district consolidations, the number of employees working for the Forest Service at Quinault has declined dramatically over the past 10 to 15 years. Many of the district employees were from the community, especially those that worked as seasonal employees (e.g., on fire crews). There are currently no seasonal employees on the district. Thus, the downsizing of staff not only affected community capacity (as mentioned earlier), but also reduced employment opportunities for local residents.

Grants and loans—
As part of the Northwest Economic Adjustment Initiative (NEAI), the Quinault area received a total of $65,505 in grants, all from the USDA Forest Service Rural Community Assistance (RCA) program, and leveraged $42,409 in additional funds. The community also received $8,000 in non-NEAI funds from the Forest Service. Table 17 lists the grants awarded to the community. In addition to the grants, the Forest Service provided grant-writing assistance to the Lake Quinault Community Action Forum. The largest award ($36,500) went to the Neilton water system project.

Despite the benefits of the NEAI grants, most residents interviewed were unaware that these projects were funded by the Forest Service and were part of the Plan/NEAI. Because the communities are unincorporated, it is likely that the county filed most of the grant applications, which could explain the community's lack of awareness about the grants.

Table 17—Funding awarded by the U.S. Forest Service Rural Community Assistance Program to the Lake Quinault area

Fiscal year	Applicant	Grant name	Base economic programs FS[a] award	Base economic programs leveraged funds	NEAI[b] FS award	NEAI leveraged funds
			Dollars			
1993	Grays Harbor Chamber of Commerce	Amanda Park Visitor's Center	3,000	7,569		
1994	Grays Harbor County	Lake Quinault Community Plan			12,205	5,231
1996	Grays Harbor County	Neilton Water System			36,500	20,000
1997	Grays Harbor County	Lake Quinault Spirit Award	5,000	1,000		
1998	Grays Harbor County	Lake Quinault Land Use Plan			16,800	17,178
Total			8,000	8,569	65,505	42,409

[a] FS = Forest Service Rural Community Assistance Program.
[b] NEAI = Northwest Economic Adjustment Initiative.

Helping to promote local tourism—

To help promote tourism in the area, as well as shift the focus of the forest from timber production to recreation and environmental protection, the forest has worked on improving trails and campsites around Lake Quinault.

The Forest Service Visitor's Center, located next to the Quinault Lodge, serves as an important stopping point for many tourists to the area. In 2003, about 1,000 people came through the doors of the visitor's center. The Forest Service staff at the front desk provides information not only about the forest, but visitor information about the area in general, including the national park, beaches, and scenic travel routes around the peninsula. The staff also issues permits to harvest nontimber forest products (NTFPs) (such as salal (*Gaultheria shallon* Pursh) and mushrooms). The office serves a critical role with regard to interfacing with the public, and creating a link among the local community, the Forest Service, and visitors to the area.

Changing Relations Between the Lake Quinault Area Communities and the Olympic National Forest

Most interviewees felt that the relationship between the community and Forest Service had changed over the past 10 to 15 years as a result of the curtailment of logging, agency downsizing, and the consolidation of the Lake Quinault District with the Forks (Sol Duc) District. Because the new district office is now headquartered in the town of Forks, the district ranger spends much of his time there. The lack of a permanent district ranger at Quinault has resulted in a greater disconnect between the community and Forest Service. "It doesn't work well being based in Forks," says one local resident, "[the district ranger] is a good guy, but he has too many things to do. Without the ability to make decisions locally, it's been harder to get things done."

The loss of Forest Service employees from the community has meant fewer interactions between the community and the agency. Connections, however, are still maintained through personal relationships with the remaining staff, simply by the fact that they are long-term members of the community. New connections between the Forest Service and community have also been made through partnerships and committees, such as the Grays Harbor RAC, and the Lake Quinault Community Action Forum. Another place where connections are made is with the school. Each summer, the Forest Service provides jobs to high school students to help with trail and campsite maintenance and repair. One interviewee mentioned that by working with these students, it made the students understand what the Forest Service does, and relationships improved between the Forest Service staff and students and their families.

The Quinault Indian Nation

Community Change and the Effects of Forest Management Policy

Demographic change—

According to the U.S. census, 65 percent of the population of the Quinault Indian Reservation was Native American in 2000 (959 people) (table 18). About 28 percent of the population is Caucasian, most of whom reside in the Amanda Park area (table 18). The population declined by about 5 percent (from 1,542 to 1,471) between 1990 and 2000. This is in contrast to a 5-percent growth in population for Grays Harbor County. In terms of racial composition, the Caucasian population has declined the most from 546 in 1990 to 410 in 2000, most likely owing to an outmigration of displaced timber workers from the Amanda Park area. The Native American population also declined slightly, from 980 to 959. About 7 percent of the population in 2000 was of Hispanic origin, up from 4 percent in 1990. Most of the Hispanics live in the Amanda Park area.

The median age is also decreasing on the Quinault Indian Reservation, as it is with the county and buffer BGAs. It is interesting to note, however, that the median age on the Quinault Indian Reservation is about 10 years younger than that of the county (30 versus 39) (table 19). The greatest declines were in the age category between 0 and 4 and 20 and 29, both by 34 percent (table 20). The 20- to 29-age group may be those that have left the community to go to college or expand their career options. In contrast,

Table 18—Population by race, Quinault Indian Nation and Grays Harbor County, 1990 and 2000

	Population by race					
	Caucasian	African American	Native American	Asian and Pacific Islands	Other	2+ races[a] (2000 only)
			Number of people			
1990 Quinault Indian Nation CBGA	546	3	980	7	6	
2000 Quinault Indian Nation CBGA	410	0	959	12	62	28
1990 county	60,308	45	2,665	740	417	
2000 county	59,544	172	3,325	762	1,313	2,078

CBGA = census block group aggregate.

[a] The race question was changed in the 2000 census to allow individuals to choose two or more races, whereas in 1990 they were only allowed to choose one race. Hence, some individuals choose a particular race in 1990 and then in 2000 choose two or more races (see 2+ races 2000 only column). No percentage change was calculated for population by race owing to this change.

Table 19—Population, age, school enrollment, and educational attainment for the Quinault Indian Nation (measured at the census block group aggregate [CBGA] level), and Grays Harbor County, 1990 and 2000

	1990	2000	Change
			Percent
Total population, Quinault Indian Nation CBGA	1,542	1,471	-4.60
Total population, county	64,175	67,194	4.70
Median age, Quinault Indian Nation CBGA	26.9	29.7	10.41
Median age, county	35.3	38.6	9.35
School enrollment, Quinault Indian Nation CBGA	401	443	10.47
School enrollment, county	12,755	14,390	12.82
Completed high school, Quinault Indian Nation CBGA (percent)	64.59	73.52	13.83
Completed high school, county (percent)	73.97	81.09	9.63
Bachelor of arts, graduate, professional degrees, Quinault Indian Nation CBGA (percent)	8.28	11.27	36.11
Bachelor of arts, graduate, professional degrees, county (percent)	10.97	12.66	15.41

the 45- to 64-age category has increased by 40 percent. This is also the fastest growing age category for the county, which grew by 35 percent.

School enrollment has increased by 10 percent, which mirrors the county increase of 13 percent (table 19). The percentage of students completing high school has also increased by 14 percent from 65 percent to 74 percent, although the percentage is still lower than the county average (81 percent). Educational attainment has also increased by 36 percent, with 11 percent of the population holding a Bachelor of Arts or greater in 2000 compared to 8 percent in 1990. This rate is comparable to that of the county, which has an average of 13 percent of the population with a Bachelor of Arts or greater (table 19).

Economic change—

In terms of economic changes, median household income on the Quinault Indian Reservation increased by 10 percent, from $25,724 in 1990 to $28,171 in 2000 (table 21). Compared to the county average, however, which increased by 19 percent (from $28,596 to $34,160), median household income on the Quinault Indian Reservation is low. Unemployment showed a 29-percent decline, from 19 percent to 13 percent, although some interviewees felt that this was an underestimation (table 21) of actual employment. Also, because many tribe members work seasonally in fishing, unemployment is highly seasonal. According to statistics from the Bureau of Indian Affairs, unemployment on the Quinault Indian Reservation was 45 percent in 2000 (Stocks 2003).

The poverty rate declined between 1990 and 2000, although it still remains high (28 percent), compared to the county (16 percent) (table 21). The distribution of income has shifted upward, with a growth in the number of people earning between $35,000 and $100,000, from 104 to 171 (table 22).

Table 20—Age distribution, Quinault Indian Nation and Grays Harbor County, 1990 and 2000

	Age distribution					
	0 to 4	**5 to 19**	**20 to 29**	**30 to 44**	**45 to 64**	**65 and up**
			Number of people			
1990 Quinault Indian Nation CBGA	194	410	266	351	235	86
2000 Quinault Indian Nation CBGA	128	438	175	319	328	83
Change (percent)	-34.02	6.83	-34.21	-9.12	39.57	-3.49
1990 county	4,722	14,171	7,813	14,787	12,492	10,190
2000 county	4,239	14,833	7,130	13,784	16,876	10,332
Change (percent)	-10.23	4.67	-8.74	-6.78	35.09	1.39

CBGA = census block group aggregate.

Table 21—Median household income, unemployment, and poverty, Quinault Indian Nation and Grays Harbor County, 1990 and 2000

	1990[a]	**2000**	**Change**
			Percent
Median household income, Quinault Indian Nation CBGA (dollars)	25,724	28,171	9.51
Median household income, county (dollars)	28,596	34,160	19.46
Unemployed, Quinault Indian Nation CBGA (percent)	19.07	13.45	-29.47
Unemployed, county (percent)	9.31	8.32	-10.63
Poverty, Quinault Indian Nation CBGA (percent)	32.33	28.24	-12.65
Poverty County (percent)	16.37	16.10	-1.65

CBGA = census block group aggregate.

[a] The 1990 median household income has been adjusted for inflation.

Table 22—Household income distribution, Quinault Indian Nation and Grays Harbor County, 1990 and 2000

	Household income distribution[a]								
	<$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
	Number of households								
1990 Quinault Indian Nation CBGA	83	51	110	73	60	40	4	3	6
2000 Quinault Indian Nation CBGA	73	55	71	71	80	64	27	9	1
1990 county	5,156	3,216	5,254	4,086	4,416	2,512	511	264	188
2000 county	3,260	2,389	4,128	3,916	4,921	4,883	1,951	984	375

CBGA = census block group aggregate.

[a] These data are not adjusted for inflation and are reported in 1990 dollar values and 2000 dollar values, respectively.

According to the socioeconomic well-being index, socioeconomic well-being on the Quinault Indian Reservation has changed very little. In 1990, the area ranked among communities in the "very low" category, with a socioeconomic index score of 45.56. In 2000, the score decreased slightly to 44.18.

In terms of employment by industry, the manufacturing sector lost the greatest number of jobs between 1990 and 2000, from 125 to 35 (table 23). Many of these jobs were probably with the numerous shake mills that once lined Highway 101 around Lake Quinault, as well as the tribal shake mill that operated in Taholah. Public administration had the greatest gain in employment, more than doubling from 63 in 1990 to 142 in 2000. These jobs are most likely with the Quinault Indian Nation. Increases were found for jobs in health/education, the arts/recreation/accommodation/food services, construction, and agriculture/forestry/fishing/mining.

Key social and economic changes (as told by community residents)—

Based on interviews with community members, some key social and economic changes that have taken place on the Quinault Indian Reservation include the following:

Table 23—Employment by industry, Quinault Indian Nation, 1990 and 2000

Industry	Number of employees	
	1990 Quinault Indian Nation CBGA	2000 Quinault Indian Nation CBGA
Agriculture, forestry, fishing, hunting, and mining	45	65
Construction	26	42
Manufacturing	125	35
Wholesale trade	23	20
Retail trade	23	20
Transportation, warehousing, and utilities	2	12
Finance, insurance, real estate and rental, and leasing	4	12
Education, health, and social services	87	106
Arts, recreation, accommodations and food services	25	56
Public administration	63	142
Professional and other services	65	32
Total	488	540

CBGA = census block group aggregate.

Decline in the fishing industry—Not captured in the census statistics is the loss of income by tribal fishers owing to declines in the salmon runs, coupled with competition from farm-raised salmon, and state and federal regulations restricting salmon harvests. Fishing has been the lifeblood of the Quinaults for millennia. Since the late 1970s, commercial fishing has also been critical to the economy of many tribe members. For the past 20 years, however, declining salmon runs and poor prices have stressed the local fishing economy. Between 1982 and 1986, employment in the fishing industry declined dramatically. Within the past 5 years, the prices received for salmon have also plummeted to as low as $0.20 per pound (compared to the 1970s, when fishermen were receiving up to $2.00 per pound). Although many tribe members still fish, prices are often so low that many have dropped out of commercial sales—fishing primarily to meet subsistence, nutritional, nor ceremonial needs. In 2002, conditions were so bad that the Quinault Indian Nation began to develop and implement a salmon disaster relief plan to assist individuals and families meet basic subsistence needs, promote economic diversification in the community, and work toward improving salmon and steelhead (*Oncorhynchus* spp.) runs through scientific research and fish management (Stocks 2003). The tribe has also made efforts to hire displaced fishers in its natural resources programs, such as monitoring fish populations, and working on watershed restoration projects.

The loss of income in fishing cannot be linked to the Plan. The principal cause is low fish populations. An additional factor is Endangered Species Act (ESA) listings of certain salmon species, which have restricted the allowable harvest. Some interviewees mentioned that the Plan might have helped to improve fish populations through habitat improvement resulting from the curtailment of logging, the focus on watershed restoration, and the Aquatic Conservation Strategy. The decline in fisheries-related income is more likely due to competition from farmed salmon.

Decline in timber industry—During much of the mid-1900s through the 1970s, a very high proportion of tribal men were employed as loggers or mill workers, particularly in the village of Queets. Many timber workers (both tribal and nontribal) lost their jobs with the decline in the regional timber economy beginning in the 1980s.

The loss of manufacturing jobs has been due in part to the closure of many shake mills, particularly in the Amanda Park area. Although about a half dozen shake mills continue to operate in the area, and a few are even owned by tribe members, at least six to eight have closed, and those that continue to operate have significantly downsized their operations. The Quinault Indian Nation also had its own tribal shake mill in Taholah for 20 years, but recently closed it for relocation and renovation

The Quinault Indian Nation continues to actively log on the Quinault Indian Reservation, and logging serves as one of the prime sources of revenue for the Quinault Indian Nation. Nevertheless, harvest levels have dropped off, most recently owing to the low price of timber. The annual volume of timber harvested from the reservation declined dramatically in the early 1980s to around 50 mmbf, compared to 100 to 250 mmbf of volume harvested per year in the 1960s and 1970s. Since the 1980s, the annual harvested volume has continued to decline to around 25 mmbf. Cedar salvage is also important on the reservation. Currently, 13 tribal contractors have contracts with the Quinault Indian Nation to harvest cedar blocks. These contractors sell the cedar to the local shake mills. Most now subcontract the work out to Hispanic crews.

Forest management changes on the Olympic National Forest may have displaced some tribal timber workers, particularly in the Amanda Park area. In addition, the closure of several cedar shake mills along Highway 101 around Lake Quinault can be partially attributed to the decline in availability of cedar trees from the Olympic National Forest. Other factors, however, also affected the cedar shake industry, such as competition from Canadian imports and federal requirements for fireproofing shakes and shingles. Although some tribe members may have been affected by these changes, most interviewees felt the impact to tribe members who worked in the timber industry was fairly minimal, either because there were not that many working in the industry by the late 1980s/early 1990s, or that many were able to continue to work on reservation lands.

More likely causes of change include the overall decline in the timber economy of the region, particularly for Grays Harbor County, that preceded the Plan, and was exacerbated by the Plan and timber harvest restrictions on state and private lands as a result of ESA listings. This decline initially began as a result of structural changes within the timber industry (i.e., increased mechanization, retooling mills, laying off of union employees, national recession, changes in the export market, etc.). More recently, the prices for timber have also declined owing to competition from imports. Activities related to forest management, such as tree planting and thinning, which were once carried out by tribe members, have also shifted to Hispanic crews.

Decline in revenues from North Boundary and Section 2 lands—As mentioned above, in 1988–89, the Forest Service returned 11,000 acres of land (North Boundary Expansion Area) to the tribe owing to a surveying error from the 1800s. Active timber sales were occurring on this land when it was transferred, and the Quinault Indian Nation's intentions were also to harvest the timber from the land (much of it old growth) as part of its program of generating revenue for land acquisition. As part of the land transfer agreement, the Quinault Indian Nation had to submit an operating plan to the Bureau of Indian Affairs and U.S. Fish and Wildlife Service about its timber harvest plans. The initial plan was rejected, and while the Quinault Indian Nation was in the process of reworking the plan, ESA restrictions came into play, first with the spotted owl, followed by the marbled murrelet (*Brachyramphus marmoraturs*), bull trout (*Salvenius confluentus),* and bald eagle (*Haliaeetus leucocephalus*). To comply with specifications by the U.S. Fish and Wildlife Service under the ESA, the original logging plans had to be modified, which precluded most of the logging activity originally proposed. The original timber value of the property was $100 million. As time passed, the value of the timber decreased. Many of the local mills closed or retooled for smaller diameter timber. Eventually, there were no longer any local mills left to process the old-growth trees proposed to be harvested from the North Boundary. The small volume of large-diameter timber that was harvested had to be shipped to California for milling. The Quinault Indian Nation renegotiated for a $50 million settlement, but negotiations were set back by changes in federal administration. The case remained in litigation at the time of this study.

In addition to the expected revenues from the North Boundary land, the Quinault Indian Nation also anticipated revenues from the Section 2 lands (PL 100-638) on the Olympic National Forest. As mentioned previously, as part of the land transfer agreement, the U.S. Forest Service agreed to share 45 percent of the revenues generated from the Section 2 lands with the Quinault Indian Nation. Because this agreement was made in 1988–89, that is, prior to the Plan, the tribe anticipated substantial revenues generated from commercial logging activities. Active clearcutting and old-growth logging were occurring on the site when the law was passed. When the Plan was launched, the Section 2 land was designated as adaptive management area (AMA) lands. Although the Plan significantly decreased logging activities on the forest (from about 250 to 10 mmbf per year), the land use practices designated for the AMA lands allowed for commercial thinning. As commercial thinning activities were being planned for the site, however, a survey and manage species—the warty jumping slug (*Hemphillia glandulosa*)—was identified in the area, and commercial thinning harvests were suspended. After more extensive surveying, the slug was found to have a healthy population, and was removed from the threatened list of species. With a backlog of projects and thinning activities, the level of activity on the land has been relatively small. The Quinault Indian Nation has received from $0 to $1,200 in quarterly payments from the Section 2 lands, primarily from some gravel mining activities and through the sale of NTFP permits (such as for harvesting salal). The Forest Service is currently working on a new plan for commercial thinning that would gradually result in $30,000 per year in revenues to the Quinault Indian Nation.

Growth of jobs in tribal government—The growth in the number of jobs with the Quinault Indian Nation has been a result of the expansion in tribal government. In 1990, the number of people employed in the Quinault tribal

government was around 50 to 75. Currently, the Quinault Indian Nation employs about 350 full-time employees. The Quinault Indian Nation has also developed a number of business enterprises, including Quinault Pride Seafood (seafood purchasing, marketing, and processing plant), Quinault Land and Timber (timber purchasing and land acquisition), Quinault Beach Resort and Casino, Quinault Maritime Resort (yet to be constructed), and the Quinault Mercantile (stores in Taholah and Queets). The Quinault Beach Resort and Casino, located about 25 miles south of Taholah at Ocean Shores, has been in operation since 1999, and employs about 325 people year-round, with slightly more in summer. The combination of these enterprises together with jobs in tribal government has made the Quinault Indian Nation the second largest employer in Grays Harbor County,[26] and contributes $20 million in wages annually to the local economy.

In addition to the growth of jobs in tribal administration (within Quinault Indian Nation) and tourism (associated with the Casino/Resort), several interviewees spoke of new job opportunities in firefighting. Although the Quinault Indian Nation has always maintained a small firefighting crew, employed through the Quinault Department of Natural Resources, within the last 3 years, the demand and available funding for firefighters has increased. In 2003, there were over 30 people on the tribe's fire crew. The Quinault Indian Nation serves as the dispatch center for all tribes on the peninsula, and sends crews to fight fires nationwide, as well as to assist with national emergencies. Several interviewees mentioned that firefighting suited many tribe members because of the relatively good salary (over $10 per hour plus substantial overtime), and seasonality of work (the fire season generally does not overlap with the fishing season).

The development of the tribal government and the increase in employment within the Quinault Indian Nation are in large part due to the implementation of tribal self-governance and the capacity of the tribal administration and staff to develop partnerships and obtain grant funding, and to the longevity and competency of the Quinault Indian Nation employees.

Poverty and unemployment remain high—Poverty and unemployment continue to remain high among residents, as does the incidence of social problems linked to poverty, such as substance abuse and domestic violence. In a housing survey of 353 households conducted by the Quinault Housing Authority in 1999, results showed that overcrowding of houses was a major problem (191 households had more than one family living in the house); the condition of many homes was inadequate (11 percent lacked a cook stove or refrigerator, 35 percent had plumbing problems, 34 percent had electrical problems, and 23 percent had inadequate heat); and there were not enough houses to meet people's needs (102 families reported that their house was inadequate) (Stocks 2003). The survey also found that 58 percent of families had incomes less than $20,000, and 20 percent reported incomes below $5,000. Income levels for residents of Queets were lower than the rest of the reservation, with 48 percent of the population having incomes below $15,000 compared to 36 percent for the rest of the reservation. The survey also found that 64 percent of the residents of Queets would prefer to live elsewhere compared to 22 percent for the rest of the reservation.

Despite the high poverty rates on the Quinault Indian Reservation (100 percent of the students receive free lunch), a greater proportion of students are completing high school and going to college than in the past. Improvements in high school graduation rates have been attributed to programs such as GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs), which encourage youth to attend college, and to greater support and encouragement by parents and the community as a whole for children to go to college. The Evergreen State College, located in Olympia, has a satellite program at Taholah, which has allowed more people to complete college degrees while remaining on the reservation. As with other natural resources-dependent rural communities, in the past, well-paying jobs for young people were readily available in fishing or logging. Thus, there was little incentive for youth to finish high school and go to college. Also, in 1990, there was no local

[26] Weyerhaeuser is the largest employer in the county.

high school in Taholah, which likely contributed to the low school attendance and lack of community support at that time.

Adaptation to Change and the Role of Forest Service Assistance

Tribe members and the Quinault Indian Nation as a whole have developed several strategies for adapting to changing socioeconomic conditions. Many have had to shift away from natural-resources-based work, such as fishing and forestry, to employment in the service sector (e.g., at the casino) or in tribal administration. Several tribe members have returned to school to pursue college degrees.

Some tribe members have continued to try to make a living in the timber industry. Some have started shake mills. Currently tribe members own three shake mills in Amanda Park. One interviewee noted that in the past, tribe members worked as laborers but are now becoming mill owners and operators. Some mills also institute tribal preference when hiring.

Others have had to move away from the reservation to find work. Many tribe members now live and work in the Aberdeen/Hoquiam area.

The Quinault Indian Nation has also made a strong effort to diversify its local economy both by exploring new approaches to prosper from its natural resources and by developing economies that are less dependent on these resources. Providing employment opportunities within the Quinault Indian Nation has been by far the most direct approach to helping to offset job losses in natural-resources-based industries. Some displaced fishers and timber workers were able to obtain jobs within the Quinault Department of Natural Resources. The Quinault Indian Nation has temporarily employed displaced fishers to carry out fish monitoring and watershed restoration work. Others obtained work in firefighting. Jobs outside of natural resources include work in tribal administration, as well as with the casino.

The Quinault Indian Nation is also actively pursuing other economic development opportunities. In its 2003 Comprehensive Economic Development Strategy Report (Stocks 2003), the Quinault Indian Nation identified six economic development strategies: food processing, aquaculture and fisheries, forest products (timber and NTFPs), international trade, light industry, and tourism/visitor services. The first three focus on the refinement and value-added processing of its natural resources. Specific projects include upgrading and remodeling the existing fish buying station in Queets, as well as the fish processing plant in Taholah. Another proposed project is to develop an enterprise or cooperative to process and market NTFPs, along with opening a buying station in Taholah; creating a cranberry bog for development of that industry; and relocating and upgrading the tribal shake mill. Prospective tourism-based industries include guided ecotours and fishing trips in the Queets area; developing a historic district, with a cultural center and museum; developing an RV park and campground at Queets; and developing the Ocean Shores Marina. Other proposed projects include developing a tribal construction company to meet the future demand for 600 new homes on the Quinault Indian Reservation over the next 20 years.

Factors promoting adaptation to change—
One factor that has helped residents of the Quinault Indian Reservation and the Quinault Indian Nation as a whole adapt to changing socioeconomic conditions has been the tribe's relatively large land base and natural resource base. The ability to harvest and market timber from the Quinault Indian Reservation has allowed the tribe to generate capital to help finance not only land acquisition but also economic development projects, such as the resort/casino.

Also, as one of the earliest tribes to implement self-governance, the Quinault Indian Nation had the time to develop the institutional capacity and longevity among its employees to successfully obtain grant monies, garner support for projects, and collaborate with various agencies and entities on projects.

Factors preventing adaptation to change—
The high poverty and unemployment rates among Quinault Indian Reservation residents indicate that many residents still struggle to get by. One factor that has been a barrier to improved socioeconomic conditions has been the relative isolation of both Taholah and Queets from larger centers of social activity and commerce that could provide more job opportunities. On the other hand, some residents mentioned

that they preferred to be isolated from main transportation routes in order to help preserve the Quinault culture.

The Role of the U.S. Forest Service in Helping to Adapt to Change

The Quinault Indian Nation's success in building its tribal government and economic development enterprises has been a result of the tribe's own efforts and internal capacity to raise funds and engage in partnerships. The U.S. Forest Service has played a supporting role in helping the tribe adapt to changing socioeconomic circumstances and move forward in its endeavors, primarily through the NEAI, the economic development component of the Plan. The tribe was able to successfully compete for grant monies from the U.S. Forest Service RCA program and other funding entities (more details are provided below in the Grants section). In addition, the Quinault Indian Nation and the Olympic National Forest have worked in close partnership on watershed analyses, and hold quarterly meetings to update and communicate to each other on forest management issues. Specific details are provided in the following sections:

Contracting—

Very few, if any, tribe members have engaged in or benefited from either contract logging (i.e., commercial thinning) or service contracts (all procurement contracts such as precommercial thinning, surveying, watershed restoration, road decommissioning, etc.) on the Olympic National Forest. Tribe members who are contractors generally focus on contracts with the Quinault Indian Nation on reservation land. There have been a few agreements between the Quinault Indian Nation and the U.S. Forest Service for precommercial thinning contracts, paid for through RAC monies. The Forest Service is also discussing the possibility of establishing a contract with the tribe that would allow the tribe to lease the Section 2 lands for the commercial harvest of NTFPs.

Forest Service jobs—

Interviewees mentioned that some tribe members formerly worked as seasonal employees for the Forest Service, mostly on fire crews. Many tribe members prefer seasonal work because it allows them to also devote certain times of year to fishing. One interviewee estimated that in the early 1980s, there were over 100 people employed on fire management crews on the Quinault Ranger District. About 40 to 50 percent of the Forest Service fire crews were Native American, and about 20 percent were Quinault tribe members. With the reductions in logging on the Olympic National Forest, the need for fire crews to conduct slash burning virtually disappeared, and the budget for fire management declined accordingly. By 1989, one interviewee estimated that there were only 10 employees in fire management on the district. Today, there are only a handful of employees in fire management for the entire Olympic National Forest. The Forest Service now has a cooperative agreement with the Washington Department of Natural Resources to carry out most fire-related activities. Thus, the downsizing of employees at Olympic National Forest has meant fewer job opportunities for both tribal and nontribe members of the local area.

Interestingly, several former Forest Service employees who lost their jobs on the Olympic National Forest as a result of the agency downsizing have obtained jobs with the Quinault Indian Nation. At least five employees from the Quinault District now work for the Quinault Indian Nation. Thus, it is the Quinault Indian Nation that has helped the Forest Service adapt to changes brought about by the Plan. The presence of former Forest Service employees on the Quinault Indian Nation staff has helped contribute to a close working relationship and collaborative culture between the two entities.

Grants and loans—

One of the most significant contributions from the U.S. Forest Service and the Plan to the Quinault Indian Nation has been grants or leveraging of other monies under the NEAI. The Quinault Indian Nation received over $5 million in funds through the NEAI, including grants from USDA Rural Development, U.S. Forest Service Community Assistance Program, and the Bureau of Indian Affairs Jobs-in-the-Woods. Most of the funds required a match from the Quinault Indian Nation. Table 24 lists the projects funded through NEAI dollars. Projects included construction of the Quinault tribal administrative building; and construction of

Table 24—Projects awarded to the Quinault Indian Nation through the Northwest Economic Adjustment Initiative

Year	Project title	Amount funded
		Dollars
1994	Administrative Bldg. Consolidation	2,300,400
1994	Queets Community Store	517,250
1994	Jobs in the Woods	300,000
1994	Lake Quinault Interpretive Center	60,000
1995	Salmon River Restoration	183,000
1996	5th Ave. Mini-Mall Business Center	813,267
1996	Jobs in the Woods	348,092
1997	Rural Business Enterprise Grant	100,000
1998	Salmon River Watershed Analysis	249,677
2001	Seafood Business and Marketing Plan	177,063
Total		5,048,749

the only market and gas station at Queets; and construction of the 5th Avenue Mini Mall in Taholah, where the current planning and economic development offices are housed, along with a small museum.

Jobs-in-the-Woods grants, administered by the Bureau of Indian Affairs, provided funding for watershed analyses and restoration on the Quinault Indian Reservation. In 1994, Jobs-in-the-Woods monies paid for six dislocated timber workers and fishers to remove debris and other logging waste from rivers on the reservation. In 1996, the Quinault Indian Nation received $280,000 in Jobs-in-the-Woods monies to help fund a watershed analysis of the Quinault River. Jobs-in-the-Woods funds also helped pay for watershed analyses of the Salmon River and Raft River, and an inventory and analysis of culverts on the reservation. Four tribe members were hired and trained to conduct the culvert analysis. Although the initial intent of Jobs-in-the-Woods was to retrain displaced timber workers to obtain training and jobs in ecosystem restoration, relatively few tribe members benefited from these funds (about 10 displaced timber workers or fishers were directly hired to work on these projects). Nevertheless, some interviewees said that without the Bureau of Indian Affair's Jobs-in-the-Woods dollars, it would have been impossible to conduct watershed analyses of the rivers on the Quinault Indian Reservation and implement subsequent restoration activities. For example, the culvert analysis was one of the recommendations that came out of the watershed analysis. One interviewee said that he expected more work to be available in the future as "spin-offs" of the watershed analyses.

Additional funding provided through the state's Jobs-for-the-Environment[27] program funded stream type verification studies in the Quinault watershed, allowing for 10 dislocated timber workers to conduct field surveys. In 2000, the project expanded to cover the entire Usual and Accustomed[28] territory of the Quinault Indian Nation.

Changing Relations Between the Quinault Indian Nation and the Olympic National Forest

Prior to the late 1980s, there was little interaction between the Quinault Indian Nation and Olympic National Forest at an administrative level. The Olympic National Forest, however, did serve as a source of jobs for tribe members. For example, tribe members who were loggers harvested timber from the Olympic National Forest. Many tribe members also worked as Forest Service seasonal employees on fire crews. Budget cuts have significantly reduced the Forest Service's seasonal workforce, thus eliminating most temporary fire crews. Over the past 10 years, the Quinault Indian Nation's own fire crew has grown substantially. Ironically, the tribe in recent years has become a source of jobs for former Forest Service employees.

[27] Washington's Jobs-for-the-Environment (JFE) program was created through a house bill passed by the Washington state legislature in 1993, and served as the template for the federal Jobs-in-the-Woods program. The program recruited dislocated natural resource workers (originally forest workers, but later expanded to include fisheries workers), providing them with restoration training and certification. Funding was provided through state legislative appropriations and disbursed through competitive JFE grants, the Competitive Watershed Restoration Partnership Program grants, allotments to Department of Natural Resources regional offices for work on trust lands, and Washington State Department of Ecology's Conservation Corps. Between 1995 and 1997, the JFE program collaborated with the U.S. Fish and Wildlife Service's Jobs-in-the-Woods program, pooling funds and resources. In 2000, the JFE program was terminated. State funds that went to JFE are now being directed to the Washington State Salmon Recovery Fund.

[28] Usual and Accustomed lands include all lands that fell within the territory of a tribe prior to Euro-American settlement.

Overall, the relationship between the Quinault Indian Nation and the U.S. Forest Service has improved over the past 10 years. One of the most important factors in developing a closer working relationship was the increased national emphasis on government-to-government relationships between federal agencies and tribes in the late 1980s and early 1990s. The growth of the Quinault Indian Nation's tribal government and resource management departments have enabled tribal employees and Forest Service employees to work closely together on projects, building a relationship based on mutual collaboration, rather than one of dependency of one entity upon another. Quarterly meetings held between the two entities also ensure that there is regular communication about resource management issues and decisions. Details of this collaborative relationship will be discussed in chapter 4.

Improvements in the relationship between the tribe and U.S. Forest Service have also been brought about by the changes in management priorities on federal forest lands. The location of the Quinault Indian Reservation downstream of U.S. Forest Service land means that the tribe is highly affected by management decisions made by the Olympic National Forest. The Plan's emphasis on resource protection thus directly benefits the tribe by focusing on improving water quality and restoring habitat for salmon and other aquatic species—something that is of vital interest to the tribe.

The relationship that actual tribe members have with the Olympic National Forest, however, has been mixed. The Olympic National Forest is part of the ancestral territory or Usual and Accustomed Lands of the Quinault people. Thus, tribe members have always used the forest for hunting, fishing, gathering of NTFPs, and spiritual purposes. Many tribe members had favorite hunting spots within the Olympic National Forest where they would regularly hunt for deer and elk. With the Plan and closure of many roads, access to hunting grounds has been reduced. Some tribe members said they no longer hunt on the Olympic National Forest because the only access to their hunting grounds is by foot owing to road closures. The Forest Service has also put in locked gates on many of its existing roads, further limiting access by tribe members. Hunting season for tribe members begins on July 30th (versus October for non-Indians), and many of the gates are locked until October.

Tribe members have also traditionally used the Olympic National Forest to gather NTFPs. One interviewee states, "In the past, families would identify a location to harvest, and would maintain the landscape so that they were able to return to the area year after year…" The ability for tribe members to gathering NTFPs on the forest was significantly hindered when large-scale timber harvesting began. Over the past 30 years, additional pressure on NTFP resources has come from the floral greens industry. Thus, tribal access to NTFP harvesting on the Olympic National Forest was hindered long before the implementation of the Plan. More recently, however, as with hunting, the closure of more roads has meant reduced access to traditional gathering sites. Many of the gatherers are elderly and unable to walk long distances to collect NTFPs. The requirement of a Forest Service permit to gather NTFPs, albeit free, also deters some tribe members from gathering on the Olympic National Forest.

Chapter 3 Summary

The three case-study communities illustrate the types of changes occurring in forest-dependent communities on the Olympic Peninsula during the 1990s. All three communities showed a decrease in population and an increase in median age between 1990 and 2000. Key changes observed for all of the communities include demographic shifts in population, including an increase in older residents (owing to both the emigration of younger, working families, and the immigration of retirees) and an increase in the Latino population. All three communities also showed a shift in their economic base, with a decline in timber-industry-related employment, and an increase in service-industry and government (including schools) jobs. Quilcene's proximity to the Puget Sound metropolitan area and affordable housing market has attracted a new population of professional and service industry workers that commute to larger economic hubs. For the Lake Quinault area, residents are increasingly turning to tourism for their livelihoods, commuting to Aberdeen/Hoquiam for work, or working at the school. A large proportion of the Latino population of the area is employed

in the cedar shake and the floral greens industries. For the Quinault Indian Nation, employment in tribal government or at the casino has helped offset job losses in the fishing and timber industries.

The role of the Plan in affecting these changes is variable. Many of the changes observed in communities are a result of the restructuring of the forest products industry that began in the 1980s, national economic trends during the 1990s, and demographic shifts (such as the immigration of the Latino population). On the other hand, for communities such as Quilcene and Lake Quinault, which were highly dependent on the national forest for timber and also served as Forest Service district headquarters, the impacts of the Plan were significant. The loss of timber industry and Forest Service jobs not only affected individual workers and their families, but also had a profound affect on the social capital of these communities. The loss of Forest Service employees from these communities effectively removed many of the communities' leaders and active participants, reversing a policy of community building and community participation that had been operating for a century. Secondary and tertiary businesses that served the timber and Forest Service workers (e.g., gas stations, grocery stores) also suffered. In addition to the economic and social impacts, the loss of jobs and emigration of both working class and professionals from these communities left a psychological scar on the communities, resulting in feelings of anger and depression, and often leaving remaining residents feeling victimized, criminalized, and filled with a sense of hopelessness.

The mitigation measures implemented under the Plan to offset job losses (e.g., contracting, grants and loans, partnerships) were overall insufficient, owing largely to the Forest Service budget declines that were occurring both regionally and on the Olympic National Forest. For example, contracts in ecosystem restoration on the Olympic National Forest were insufficient to keep local contactors employed year-round, much less encourage new contractors into the business. For grants and loans offered under the NEAI, the Quinault Indian Nation was the most successful of the three case-study communities in obtaining monies, owing largely to the presence of a paid economic development staff person to develop projects, apply for funds, and network with funding entities.

Relationships between the Forest Service and case-study communities have also changed. The curtailment of timber harvesting activities on the Olympic National Forest combined with the loss of Forest Service employees from Quincene and Lake Quinault have weakened the ties between the Forest Service and these communities. Despite the diminished economic importance and lack of physical presence of the Forest Service in these communities, remaining Forest Service employees still make an effort to participate in community affairs and assist with community planning and economic development efforts. In contrast, the relationship between the Forest Service and the Quinault Indian Nation has grown and improved owing in part to the recognition of the tribe as a sovereign nation, (which institutionalized formal communication channels), the growth of the tribal government and its resource management departments, and collaboration on watershed assessments under the Plan. On a more formalized level, multiparty advisory committees (i.e., Provincial Advisory Committees and Resource Advisory Committees) have enabled community members to have a greater voice in management decisions on the Olympic National Forest.

Chapter 4: Communities and Forest Management

Chapter 3 focused on the links between changes in socioeconomic benefits from the Olympic National Forest under the Northwest Forest Plan (the Plan), and community-level change and adaptation. Chapter 4 examines current forest management issues of concern to communities, and the role of the Plan in shaping those issues. It also looks at the role of communities in collaborating with the forest to address management issues and joint forest stewardship, and at how the Plan has influenced this collaborative relationship. Chapter 4 aims to address two of the socioeconomic goals of the Plan: (1) to improve collaboration between agencies and communities and (2) to protect forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems. Chapter 4 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 land management agencies and communities in forest management and joint forest stewardship activities. This section examines how collaborative relationships between the Olympic National Forest and the three case-study communities have evolved since the Plan was implemented.

Most interviewees felt that the forest was engaging in more collaboration and collaborative stewardship activities with the public than in the past. Some, however, felt that the level of collaboration had not necessarily increased, but that the people that the forest was collaborating with had changed from timber industry interests to recreation, fish and wildlife, and watershed-oriented interests.

Who Are the Collaborators?

The Plan's emphasis on ecosystem management and protection of fish, wildlife, and watersheds has attracted these special interests. The establishment of multiparty organizations, such as watershed councils (called "Lead Entity Groups" in Washington), has also helped promote a climate of collaboration. Some examples of collaborating partners include tribes, watershed councils (Lead Entity Groups), volunteer recreational groups (e.g., Volunteers for Outdoor Washington, and Washington Trails Association, Interagency for Outdoor Recreation, Backcountry Horsemen's Association), community and economic development groups (Tacoma Urban League, Columbia Pacific Resource Conservation and Development Program), educational institutions (e.g., Grays Harbor College), environmental groups (Olympic Forest Coalition, NW Ecosystem Alliance), wildlife conservation groups (Rocky Mountain Elk Foundation, American Birders Association, Audubon Society, Pacific Coast Salmon Coalition, Trout Unlimited), conservation districts, state agencies (State Fish and Wildlife, Department of Ecology, Department of Natural Resources), and industrial timberland owners (Simpson Timber Company, Rayonier).

The establishment of the Province Advisory Committees (PACs)[29] and more recently, the Resource Advisory Committees (RACs) has also been an important mechanism for promoting collaboration. There are two RACs on the Olympic: the Grays Harbor RAC, and the Olympic Peninsula RAC (which includes Clallam, Jefferson, and Mason Counties). The Community Economic Revitalization Teams (WA-CERT in Washington) under the Northwest Economic Adjustment Initiative (NEAI) have also promoted collaboration among different state and federal agencies as well as between the agencies and communities.

Benefits of Collaboration

Much of the Forest Service's "culture" of collaboration developed out of necessity. With budget cuts and staff reductions, the ability to carry out the work that needs to be done depends on labor and funds from other sources. The Forest Service collaborates with several special interest groups around watershed, wildlife, and fisheries protection issues, and with volunteer groups on trail projects

[29] Under the Plan, PACs were established to allow nonfederal officials and the public to have a voice in how federal forests were to be managed. The PACs serve as advisory bodies to the 12 Provincial Interagency Executive Committees, the group responsible for land management activities within each province. The PAC members include representatives from federal, state, county, and tribal governments, the timber industry, environmental organizations, recreation and tourism groups, and the general public (Tuchmann et al. 1996). The Olympic Province Advisory Committee (OPAC) is the PAC for the Olympic National Forest. The OPAC members play an advisory role in assisting the Forest Supervisor in implementing the Plan (USDA FS 2004).

and recreation projects. Partnerships with various groups provide opportunities for cost sharing on projects, as well as volunteer labor, supplies, or services. For example, the State Recovery Fund for salmon (called the "SuRF Board") provides funding for watershed enhancement projects, but does not allow the Forest Service to apply directly for funds. A third party (such as a Lead Entity Group) must apply for funds, which can then be carried out on the national forest. The forest is also engaged in an Americorps program with the Washington Conservation Corps and the Washington Department of Ecology. These partners provide labor and funding/support for watershed restoration work on the forest. The Washington Conservation Corps brings in disadvantaged youth, ages 18 to 25, to work on various projects such as noxious weed removal and other restoration activities.

Within recreation, volunteer groups help with trail maintenance, and cost-sharing programs help fund trail work and recreation development. Joint funding on projects is common on recreation as well as restoration-type activities. For example, the forest regularly works with the Backcountry Horsemen's Association, which helps support volunteers working on trail projects by packing tools, equipment, and food to project sites. The group also provides feedback, guidance, and support for trail projects by making them accessible to horses and other pack animals.

Many Forest Service employees also reported that developing relationships with different collaborating groups was also beneficial, if not more important, than the financial benefits. "Building relationships—a benefit that outweighs the funding. It allows local communities to have a voice in what happens on National Forest lands." Another comment was, "Well, monetarily it's significant; I mean, we can actually get some good work done, but building community relations is also very important." In particular, collaborative efforts have improved relationships between the Forest Service and the regional environmental community as well as with the peninsula tribes.

Forest employees are encouraged to form collaborative relationships. However, some employees noted that it takes time to develop collaborative partnerships, and as staffing resources decline and the workload increases, some people find it harder to find the time and energy to do so.

Collaboration With Communities

Quilcene—

There has been very little collaboration between the Forest Service and the community of Quilcene. Many locals involved in the timber industry lost faith in the Forest Service and have consequently been unwilling to reestablish connections with the agency. What little collaboration that has taken place has focused on helping the community develop its public water system. Much of the district's focus has been on communicating with outside interests, such as environmental groups, and entities from the county and Port Townsend. The headwaters for the water supply for Port Townsend are in the Quilcene portion of the Hood Canal Ranger District. As a result, there is ongoing involvement in water quality issues by groups from Port Townsend and Jefferson County. There are also some county and regional groups concerned with watershed health issues and salmonid populations. The relationship between the Forest Service and these groups is increasingly collaborative. There has been no known involvement of Quilcene community members with these issues.

Lake Quinault area—

Collaborative efforts between the community and the Forest Service include participation by the Forest Service with the Lake Quinault Community Action Forum, participation by community members on the Grays Harbor RAC, and service contracts and other types of work offered by the Forest Service to local residents. Most of the agency's collaborative relationships in the Quinault area have been with the Quinault Indian Nation, other organizations and agencies, and special interest groups from the region (but not necessarily local).

Quinault Indian Nation—

The level of collaboration between the Forest Service and the Quinault Indian Nation has been high for the past decade, particularly following the transfer of the North Boundary land and the sharing of revenues on the Section

2 lands. Most of the Quinault Indian Nation's interactions have been with the Quinault Ranger District (now the consolidated Pacific Ranger District), although representatives from the Supervisor's Office also attend meetings. As mentioned above, the Quinault Indian Nation and Olympic National Forest meet on a quarterly basis to discuss topics of mutual interest. These include management and revenues from Section 2 lands and the south shore of Lake Quinault, which is under the jurisdiction of the Forest Service (while Lake Quinault is owned by the Quinault Indian Nation). Additional topics of discussion include trails, home sites on the south shore, campgrounds, commercial facilities, sewage treatment, the Quinault Indian Nation fish hatchery, updates on timber sale activities, and road use and maintenance.[30] The Quinault Indian Nation also participates in the National Environmental Policy Act (NEPA) process, reviewing Forest Service projects to see if they have a detrimental effect on cultural resources.

The Quinault Indian Nation and the Olympic National Forest have also collaborated on watershed analyses. Between 1995 and 1997, the Forest Service, Quinault Indian Nation, and U.S. Geological Society worked together on watershed analysis for the Quinault River. The Quinault Indian Nation used Jobs-in-the-Woods funds to pay for Forest Service staff time on part of the project. The Forest Service and Quinault Indian Nation also collaborated on watershed analyses for the Salmon River and Boulder Creek/Cook Creek.

Another area where collaboration has occurred is through the Grays Harbor RAC. At the time of this study, the tribal representative serves as the RAC president. Interviewees felt that the RAC was not only beneficial in terms of funding projects, such as for noxious weed eradication, culvert replacement, precommercial thinning, etc., but was also helpful in improving the relationship between the Forest Service and local communities. One interviewee also felt that the RAC has helped the Quinault Indian Nation develop a better working relationship with other nontribal entities that also serve on the RAC. The one drawback mentioned with the RAC was that there was a $100,000 funding limit per year, thus limiting the size of projects or forcing projects to take 2 to 3 years to be funded.

Several factors have helped contribute to the relatively high level of collaboration between the Quinault Indian Nation and the Olympic National Forest. One reason why the relationship between the Forest Service and the Quinault Indian Nation has been so strong is due to the stability of the individuals that meet, that is, the same people have been involved in meetings since the early 1990s. An additional factor mentioned earlier is the presence of former Forest Service employees who now work for the Quinault Indian Nation. These individuals tend to be good resources and liaisons for both the tribe and the Olympic National Forest because of their knowledge of both entities. Finally, the large land base of the Quinault Indian Nation has meant that the tribe has been less dependent on the national forests for resources, and can interact with the Olympic National Forest as a neighbor and an equal. At the same time, the presence of shared resources (such as watersheds and Section 2 land revenues) have helped to maintain a working relationship between the entities.

Protecting Forest Values and Environmental Qualities

Another goal of the Plan was to protect the forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems. The biophysical monitoring modules that compose the Plan monitoring program examine how well this goal has been achieved from the biological and ecological standpoints. Here we discuss peoples' perceptions of how well noncommodity forest values and environmental qualities on the Olympic National Forest have been managed for under the Plan.

Opinions tended to depend on an individual's background and orientation, but were consistent across communities. For example, many community members who were or had been associated with the timber industry expressed concerns about the health of the Olympic National Forest, particularly with regard to the high density of young trees and the potential risk of disease or catastrophic fire. Many felt that the current second-growth stands were becoming

[30] The Forest Service still manages roads that border the North Boundary.

decadent and in need of thinning, both to create healthy habitat for fish and wildlife, as well as to establish stands that could be commercially thinned in the future.

Another forest health issue was the perceived change in patterns of gathering nontimber forest products (NTFPs). Several people noted that in the past the harvesting was small scale, but the current trend is toward very intensive harvesting that is negatively affecting the resource. In addition to the intensity of harvesting, some community members commented about the possibility of changes in the availability of NTFPs, particularly commercially important species such as salal (*Gaultheria shallon* Pursh), as the forest's composition and structure change owing to the management practices prescribed under the Plan.

Another perception of community members was of a decline in the elk populations on the forest as a result of the loss of grazing lands from cutover lands.

On the other hand, community members whose views were more in line with environmental protection felt that the changes brought about by the Plan were improving water quality and wildlife habitat. Most tribe members and employees of the Quinault Indian Nation felt that the Plan has helped protect aquatic and riparian environments. Water quality and riparian function are critical issues facing tribal fisheries, and the curtailment of logging combined with restoration activities to reduce sedimentation from roads on the Olympic National Forest has thus been seen very positively by the Quinault Indian Nation. One comment was, "The Northwest Forest Plan has helped to prevent landslides with road decommissioning, removing side casts, replacing culverts, and providing better shade." Another tribal member commented on how important it was for his children and grandchildren to know what a mature forest looks like, and was happy to see the forest preserved on the Olympic National Forest, since about 90 percent of the reservations land had been logged.

Issues and Concerns Relating to Forest Management

Many of the issues and concerns raised by community members relating to the management of Olympic National Forest relate to topics described above such as forest health, reduced access to the forest owing to road closures and decommissioning, and the ability to derive economic benefit from the forest. Again, interviewees from all three communities raised similar issues and concerns. There were also separate issues that were very specific to a particular community. These issues are discussed in greater detail below.

Forest Health

Interviewees from all three communities raised concern over what they perceived to be the unhealthy state of many tree stands on the Olympic National Forest. Residents from Quilcene were particularly concerned about the risk of fire from overcrowded, decadent stands. Fire poses a greater threat to the east-side communities owing to the drier climatic conditions and an urban interface that is encroaching on the forest. Staff from the Quinault Indian Nation also expressed concerns about the high density of stands and lack of thinning on the forest. In this case, the concern was related to the spread of disease or fire from the Olympic National Forest to the forests on the Quinault Indian Reservation. Residents of the Lake Quinault area also stated that many of the stands looked unhealthy and felt there were economic opportunities for precommercial and commercial thinning that were being lost on account of the lack of more active management.

Access to the Forest

Tied to forest management is access to locations within the national forest. Many residents voiced concern about the lack of road maintenance and management for access. The lack of funding for road maintenance and repair and the short work season, combined with the shift in focus to road decommissioning, have resulted in fewer roads being accessible to the public. One local resident observes, "Many residents were irate because the Forest Service was putting money into road decommissioning, when there were so many miles of roads that needed maintenance." In addition, flood events that occurred in the late 1990s and early 2000s left many Forest Service roads severely damaged, resulting in several road closures, some of which were important access routes to the forest and national park. Increased

procedural requirements associated with the Plan combined with the lack of funding resulted in major delays in repairing these roads. Access issues affect both local tourism as well as recreational opportunities for local residents, such as hunting. As mentioned above, road closures have also reduced access to NTFPs and other cultural resources for Quinault tribe members.

Economic Benefits

All three communities felt that changes in the management of the Olympic National Forest brought about by the Plan had reduced economic opportunities for their communities. Given the forest's proximity to these communities and its former role as the economic engine for the area, many residents felt that there should be more economic benefits available to surrounding communities via timber sales, service contracts, and recreational development.

Residents of Quilcene spoke of their desire to see more timber sales on the Quilcene portion of the Hood Canal District, but were resigned to the likelihood that this would not happen. Nevertheless, several residents saw the development of small-scale forest-based industries as an economic opportunity that should be explored. Quilcene residents and county agents also expressed concern about their ability to exploit and rely on the national forest for tourism. One business owner, commenting about the closure of the Forest Service Dosewallips road, a major access route to Olympic National Park, states,

> The washed out road directly affects the businesses and people who rely on tourists who would normally use that road. The Dosewallips was one of the few places of access into the National Forest for people with handicaps. Now there is just no way for those people to get in. Once that access is cut off, people just stop coming. Well they stopped the timber industry… So first of all, no more cutting trees, so there goes the timber industry. Then tourism can come in—we can do the parks. Well now they are not letting you into the park. You have to pay to park in the park—that's a big problem, nobody wants to do that. Then when you get on the trails, they are not kept up anymore because they don't have the money to do that or for whatever reason. They are closing the roads—so then we don't have the tourism. We lost 25,000 people last summer because of the Dosewallips closure…It's like every which way you turn you are being stopped.

The reduction in timber harvesting on the forest continues to remain an important issue for Lake Quinault area residents. There have been few timber sales (i.e., commercial thinning) in the Quinault area since the Plan was implemented. Some projects have been delayed. Although most residents are resigned to the fact that the forest is no longer managed primarily for timber production, there is still resentment and frustration among some residents, particularly those that continue to try to make a living in the timber industry.

For the Quinault Indian Nation, one of the primary issues and concerns is the low level of revenue from the Section 2 lands. The transfer of the North Boundary lands and the revenue sharing from the Section 2 lands held the promise of substantial generation of revenue for the Quinault Indian Nation. With the effect of Endangered Species Act (ESA) listings on the North Boundary and the limitations of the Plan Section 2 lands, however, the Quinault Indian Nation has not realized much economic benefit that would have come from timber harvesting on the Olympic National Forest (Section 2 lands) and the North Boundary lands.

Law Enforcement

Finally, community members from each of the three communities raised the issue of law enforcement on the forest. Quilcene residents voiced concerns about tree poaching and nonforest related activities, including methamphetamine laboratories. Residents from all three communities also described NTFP theft and the hiring of harvesters who were undocumented citizens as compounding the difficulty of enforcing Forest Service regulations.

Local Views of the Northwest Forest Plan

We asked community interviewees about their views of what was working well and not working well with the Plan. Many interviewees did not feel familiar enough with the Plan to comment. Many of the comments we did receive are reported in the preceding discussions. We sum up the observations here.

Benefits of the Northwest Forest Plan

Protection of waterways /restoring and protecting riparian habitat—
Most interviewees regardless of their background or political orientation agreed that the Plan has been effective at protecting watersheds and improving conditions in riparian zones by reducing timber harvest activities and road construction, as well as through active restoration efforts such as road decommissioning, culvert replacement, revegetation, etc. One comment was,

> It's [the Plan] actually put emphasis back on watersheds; initially, when the Forest Service was formed in the early part of the century, that was one of the main issues was managing watersheds… National Forests were the watersheds for towns and cities, and protecting them was a big thing back in the early part of the century… And that part is working pretty well; that's what we need to be doing.

Although it is difficult to determine whether restoration efforts have resulted in an increase in salmon and steelhead runs, the overall change in management priorities is initiating a long-term process of fish recovery. This process of recovery can only be seen as a positive contribution to the economy and culture of people such as the Quinaults and other tribes and individuals that depend on the salmon fishery for their livelihoods.

Areas for Improvement

More thinning—
As mentioned in previous sections, many interviewees across all three communities felt that the forest is currently in an unhealthy state. Perceptions were that the lack of thinning and other activities on the Olympic National Forest was detrimental to the forests, increasing the risk of fire and disease, as well as reducing opportunities for economic benefits to communities that could come from commercial thinning sales. The dense growth of even-aged stands was preventing light from entering the forest understory, thereby reducing species diversity and wildlife habitat. Most interviewees felt that there should be more thinning and other types of active management to help restore the forest to a healthy state. Even some individuals that were more aligned with environmental conservation felt that more thinning was needed on the forest to help develop late-successional and old-growth habitat for wildlife species. One comment was,

> If you really want a healthy forest and to have our forest be more like the old-growth type forest with uneven-age trees, openings, large woody debris, all those kinds of things, they need to get out into some of these areas that were previously altered and do some work out there—commercial thinning as an example….A lot of these harvest units, the trees come in at the same size, and are very thick, and nothing's growing on the forest floor, and wildlife avoids those areas, as an example. They need to try to figure out how to get our forest fully functioning so that it will benefit the woodpeckers and the insects and the deer and the elk, as well as people.

Although the forest has undertaken an aggressive thinning program since 1990, with between 20,000 and 30,000 acres precommercially thinned and about 10,000 acres commercial thinned by 2000, it has been precluded from doing more thinning owing to the lack of budget and staffing.

More economic benefits to communities—
To many residents, the Plan solidified the fact that timber harvesting activities would not return to previous levels. Nevertheless, many individuals employed in the timber industry still expected and anticipated a consistent level of timber sales on an annual basis. These sales never materialized at the steady, consistent rate anticipated. Because of the

lack of constant or reliable sales, individuals with a long-standing involvement in the timber industry believe the Plan is not working well. However, these individuals do not fault the Plan directly, but rather attribute the lack of sales to court challenges that have continued despite the Plan. Since 2002, however, the annual sale volume on the Olympic National Forest has stabilized at or above the probable sale quantity. This stability is expected to continue.

In addition, the lack of service contracts for restoration activities has made it difficult for contractors to make their living on Forest Service contracts alone. Bundling contract work in a way that allows contractors to maintain a viable business would help support a "restoration economy" initially envisioned under the Plan.

Impacts of Endangered Species Act and survey-and-manage restrictions on management activities— Many people felt that the Forest Service was paralyzed from doing any activities because of restrictions associated with the ESA and survey and manage requirements. The survey and manage strategy has been heavily modified, and its effects on project development and implementation have been greatly reduced. However, ESA restrictions continue to delay projects owing to the short work window available for carrying out projects. Although most community members were unaware of the specific details associated with project planning, many felt that in general the planning process for timber sales and other projects had become extremely cumbersome.

Chapter 5: Conclusions—Meeting Northwest Forest Plan Goals and Expectations

To conclude, we draw on the data presented in chapters 2 through 4 of this document to assess how well the socioeconomic goals and expectations of the Northwest Forest Plan (the Plan) have been met over the last 10 years on the Olympic National Forest. We also evaluate the two monitoring questions posed in the "Introduction" to this report: "Are predictable and sustainable levels of timber and non-timber resources available and being produced?" and "Are local communities and economies experiencing positive or negative changes that may be associated with federal forest management?" We then identify lessons learned from the monitoring work that may be useful in the adaptive management context. Our findings from the Olympic case study will be used, together with findings from other federal forests and communities within the Plan area, to draw broader conclusions about the effectiveness of the Plan in meeting its socioeconomic goals at a larger, regional scale. This larger, regional analysis is presented in Charnley (2006).

Monitoring Questions and Socioeconomic Goals: An Evaluation

Goal 1: Produce a predictable and sustainable supply of timber sales, nontimber forest resources, and recreation opportunities.

Timber

Most respondents felt that the goal of producing a predictable and sustainable supply of timber had not been met. Some interviewees felt that timber sales were predictable and sustainable (apart from the period during which the jumping slugs [*Hemphillia glandulosa*] halted all action), but were so low that they were of no economic importance to the region. Others felt that the timber output levels were too low to provide for sustainable community well-being or forest health. Although the probable sale quantity (PSQ) target of 10 mmbf had been met on the forest overall, interviewees perceived that the distribution of those sales was unbalanced.

Nontimber Forest Products (NTFP)

Most interviewees felt that the availability of NTFPs have not been affected by the Plan. Although demand and harvest of many NTFPs, such as salal (*Gaultheria shallon* Pursh), has increased over the past 10 years, interviewees attributed this increase to market demand rather than anything associated with the Plan. There have been some restrictions on the harvest of more sensitive types of products, such as moss, ferns, and cedar boughs, but the demand for these species tends to be much lower than salal. Some interviewees reported that access to NTFPs has decreased since the implementation of the Plan owing to road closures, reduced road maintenance, and road decommissioning.

Recreation

Opinions about recreational opportunities on the forest were mixed. Most interviewees felt that overall recreational opportunities have been predictable and sustainable. On the other hand, many community members who used the national forest for hunting and fishing felt that access to fishing and hunting grounds had diminished owing to road closures and road decommissioning. Some hunters also felt that the big game populations were negatively affected by growth of dense forest stands associated with the lack of timber harvesting and thinning. In contrast, around Lake Quinault, some interviewees noted improvements in Forest Service trails and campsites. Fees collected from the Northwest Forest Pass (required for parking and camping on Forest Service land) have helped finance improvements to recreational facilities in this area.

Goals 2 and 3: Maintain community stability, contribute to community well-being, and assist with long-term economic development and diversification in communities affected by cutbacks in federal timber harvests.

Most interviewees agreed that the Plan had a minimal impact in terms of contributing to local or regional economies. The general sentiment among interviewees was that the Plan offered too little and came too late. Some community residents recognized the efforts made by the Forest

Service and other governmental and nongovernmental entities under the Plan and Northwest Economic Adjustment Initiative (NEAI) to help affected communities. Payments to Counties, NEAI, and Title II were viewed as having some stabilizing effect. Quilcene and Lake Quinault communities received very few NEAI grants or loans, and most residents who were interviewed from these communities were unaware that these funds were associated with the Plan. The Quinault Indian Nation received a significant sum in grants and loans through the NEAI that have made important contributions toward infrastructure development and economic diversification for the tribe. Although these funds and efforts helped ease the transition, their impact has been minimal compared to the economic losses experienced by the reduction in Forest Service timber sales and the decline in social capital owing to loss of Forest Service employees from these communities. Most interviewees felt that any economic stability that did exist was due to the continued (and more recent increased) harvest of timber on private land.

Goal 4: Protect forest values and environmental qualities associated with late-successional, old-growth, and aquatic ecosystems.

As discussed in previous sections, opinions about the effectiveness of this goal were mixed. Some interviewees felt that the Plan was very effective in protecting watersheds and improving environmental quality. Others mentioned concern over the lack of sufficient thinning, and the economic effects of lost commercial thinning potential, as well as the ecological effects of potential problems of disease or increased risk of fire. Some also mentioned how the focus on protecting a few species by closing the operating season in the summer (e.g., during nesting periods for murrelets [*Brachyramphus marmoraturs*]) could have a negative impact on other species, water quality, and the ecosystem as a whole.

Goal 5: Promote agency-citizen collaboration in forest management.

Opinions were also mixed regarding collaboration. As discussed previously, some people mentioned how collaboration had not necessarily improved but that the people the agency was collaborating with had changed. In the past, collaboration had been with the timber industry, whereas today it was with recreation or fish/wildlife interests. Others felt that the relationship between communities and district-level staff had remained the same, and was based on personal relationships between long-term residents. Some noted improved relationship as a result of forums such as the Province Advisory Committees (PAC) and Resource Advisory Committees (RAC), as well as efforts made by the Forest Service to work with the environmental community.

In Quilcene, residents were encouraged by the district ranger's participation in meetings and keeping them apprised of Forest Service activities. However, many longtime residents stated they had more distant relationships with the Forest Service now than in the past.

For the Lake Quinault area, most interviewees felt that their relationship with the remaining Forest Service employees was good, but that the lack of a permanent district ranger had helped to create a greater distance between the community and the agency.

For the Quinault Indian Nation, collaboration with the Forest Service has been high. The Plan requirement for watershed assessments led directly to a high level of cooperation on a number of watershed analyses. Other factors, however, have also contributed to the collaborative relationship, such as sharing of revenue from the Section 2 lands, the transfer of employees from the Forest Service to the Quinault Indian Nation, and the increased federal emphasis on government-to-government relationships. More recently, the RAC has also played an important role in further connecting the Quinault Indian Nation and other local communities to management activities and priorities on the Olympic National Forest.

Lessons Learned for Adaptive Management

It is unrealistic to think that Plan mitigation measures could have compensated for the dramatic downturn in the timber economies of the Olympic Peninsula that had been ongoing since the 1980s, as some expected. By the time the Plan was signed, the region's timber sector had already lost a substantial portion of its job base. 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 Olympic National Forest 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 discussion is not to provide recommendations per se. Rather, it is to summarize the ideas expressed by the interviewees and the authors regarding how the forest could interact better with local communities, and provide more community benefits.

Timber Production

Many interviewees believe the forest should not only meet its PSQ of timber, but that the PSQ of 10 mmbf could be increased while still protecting wildlife habitat, promoting the development of late-successional forests, and providing a predictable and sustainable supply of wood products to support community economic development efforts. Many felt that increased thinning in overly dense stands was necessary for improved forest health, and at the same time would help provide jobs to local communities. The greatest impediment to increasing the level of timber harvesting was the lack of funding and staffing at the forest to prepare and implement thinning projects. Increased funding for thinning projects was recommended to meet this need.

Nontimber Forest Products

Nontimber forest products are collected from the Olympic National Forest for recreational, cultural, medicinal, subsistence, and economic purposes. Harvesting of floral greens alone supplies a multimillion dollar industry. Observations made by community members included the lack of law enforcement capacity by the forest to prevent NTFP theft, insufficient information on the ecological impacts of NTFP harvesting, and the need to better control the level and methods of harvesting. Interviewees who were involved in NTFP harvesting mentioned reduced access to harvest locations owing to road closures, road washouts, and road decommissioning as a growing impediment to harvesting. The forest is currently experimenting with different permitting systems (i.e., open bid leases versus individual permits) to better manage their NTFP program. Because funding for the NTFP program is still connected to revenues generated from timber receipts, budget and staffing resources have been insufficient to meet the growing demand for these resources. The forest has been trying to improve communication with NTFP harvesters, particularly with Latino groups, to benefit both the forest ecosystem and the groups and communities that depend on these resources.

Recreation and Tourism

Despite increases in recreational use and tourism on the Olympic National Forest, budget and staffing cuts have limited the forest's ability to fully develop its recreation program. Interviewees mentioned road closures, washouts, and decommissioning as affecting access to traditional fishing and hunting sites for local residents. Road closures have also negatively affected tourism in surrounding communities. Some interviewees also felt that the closure and relocation of some trails and campsites to meet Plan requirements has reduced tourism in some areas. Safety has also become a concern for some interviewees, who cited the lack of Forest Service personnel and law enforcement on the ground to control unmanaged recreation. The use of volunteer labor and collaborative agreements with outside entities has been important to the forest in meeting its recreational needs. Funding obtained from the Recreation Fee Demonstration Program (i.e., Northwest Forest Pass) has proven to be an important source of revenue for the recreation program.

Contracting

The most common comment regarding procurement contracting for the Forest Service was that the number of contracts is insufficient to keep local contractors in

business. The forest spent $6.8 million on labor-intensive contracts between 1990 and 1992, but only $1.3 million between 2000 and 2002 (when most of the contract value went to equipment-intensive work). The number of contractors working on the Olympic National Forest decreased from 110 in the 1990–92 period to 51 in the 2000–2002 period. Most contracts that went to local contractors were for heavy equipment (versus labor intensive) work. Thus, compared to the early 1990s, the economic impact of contracting on local communities has declined dramatically. Interviewees familiar with the contracting process felt that strong leadership was needed at the regional level to support local preference in awarding bids.

Community Economic Assistance

The ability for communities to receive economic assistance funds was strongly related to the capacity of the community to apply for funds. Communities and entities that were successful in receiving grant monies had a designated (professional) grant-writer, were actively networking with funding agencies, and had a clear vision of what they wanted. Forest Service Rural Community Assistance Program (RCAP) funds were highly effective at providing seed money for projects and leveraging additional funds.

Collaboration

Interviewees felt that over the past 10 years, the Forest Service has increased its level of collaboration with recreation, fish and wildlife, and watershed-oriented interests as well as peninsula tribes, while decreasing its interaction with timber interests. For communities that were once heavily dependent on Forest Service timber, such as Quilcene and Lake Quinault, this has meant less interaction and collaboration. Forest Service staff cutbacks and district consolidations have also reduced the level of communication and interaction that takes place between the agency and these communities. Structured forums for collaboration, such as the Olympic PAC and the Olympic and Grays Harbor RAC have helped to keep communities connected to the Forest Service and enabled communities to have a voice in some of the management activities that take place on the forest.

Metric Equivalents

When you know:	Multiply by:	To get:
Inches	2.54	Centimeters
Feet	.3048	Meters
Miles	1.609	Kilometers
Acres	.405	Hectares
Square miles	2.59	Square kilometers
Pounds	.454	Kilograms
Board feet, log scale	.0045	Million cubic meters

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Literature Cited

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. Draft. On file with: Regional Ecosystem Office, 333 SW First Avenue, Portland, OR 97204.

Bernard, H.R. 2002. Research methods in anthropology: qualitative and quantitative approaches. Walnut Creek, CA: Altamira Press. 752 p.

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.

Clark, R.N.; Philpot, C.W.; Stankey, G.H. 1999. Overarching assumptions underlying the Northwest Forest Plan: imbedded implications for research at the PNW Research Station. Seattle, WA: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 46 p.

Clinton, W.J.; Gore, A., Jr. 1993. The Forest Plan for a sustainable economy and a sustainable environment. In: Tuchmann, E.T.; Connaughton, K.P.; Freedman, L.E.; Moriwaki, C.B. 1996. The Northwest Forest Plan: a report to the President and Congress. Washington, DC: U.S. Department of Agriculture, Office of Forestry and Economic Assistance: 231–238. App. A.

Danks, C.; Haynes, R.W. 2001. Socioeconomic research. In: Haynes, R.W.; Perez, G.E., tech. eds. Northwest Forest Plan research synthesis. Gen. Tech. Rep. PNW-GTR-498. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 52–62.

Donoghue, E.M.; Sutton, N.L. 2006. Socioeconomic conditions and trends for communities in the Northwest Forest Plan region, 1990 to 2000. In: Charnley, S.; Donoghue, E.M.; Stuart, C.; Dillingham, C.; Buttolph, L.P.; Kay, W.; McLain, R.J.; Moseley, C.; Phillips, R.H.; Tobe, L. 2006. Northwest Forest Plan—the first 10 years (1994–2003): socioeconomic monitoring results volume III: rural communities and economies. Gen. Tech. Rep. PNW-GTR-649. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 7–35. Chapter 2.

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.

Emerson, R.M.; Fretz, R.I.; Shaw, L.L. 1995. Writing ethnographic fieldnotes. Chicago, IL: The University of Chicago Press. 272 p.

Forest Ecosystem Management and 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 [et al.]. [Irregular pagination].

Forest Community Research. 2003. Assessment of the Northwest Economic Adjustment Initiative. Taylorsville, CA: Forest Community Research.

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.

Jackson, E.J.; Lee, R.G.; Sommers, P. 2004. Monitoring the community impacts of the Northwest Forest Plan: an alternative to social indicators. Society and Natural Resources. 17: 223–233.

Kusel, J. 1996. Well-being in forest-dependent communities. Part I: A new approach. In: Sierra Nevada Ecosystem Project: final report to Congress. Assessments and scientific basis for management options. Davis, CA: University of California, Centers for Water and Wildland Resources: 361–374. Vol. 2.

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.

Lynch, K.A.; McLain, R.J. 2003. Access, labor, and wild floral greens management in western Washington's forests. Gen. Tech. Rep. PNW-GTR-585. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 61 p.

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.

Mishler, E.G. 1986. Research interviewing: context and narrative. Cambridge, MA: Harvard University Press. 206 p.

Moseley, C. 2006. Northwest Forest Plan—the first 10 years (1994–2003): Procurement contracting in the affected counties. Gen. Tech. Rep. PNW-GTR-661. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 36 p.

Mulder, B.; Alegria, J.; Czaplewski, R.; Ringold, P.; Tolle, T. 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.

Mulder, B.; Noon, B.; Spies, T.; Raphael, M.; Palmer, C.; Olsen, A.; Reeves, G.; Welsh, 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.

Oregon Natural Resources Council [ONRC]. 1999. Web site http://www.onrc.org/press/002.faqnwfp.html. (August 15, 2004).

Quinault Indian Nation. 1993. The guide to agroforestry. Taholah, WA: Quinault Indian Nation. 11 p.

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.

Riessman, C.K. 1993. Narrative analysis. Qualitative Research Methods Series 30. Newbury Park, CA: Sage Publications. 79 p.

Righter, E. 1978. Cultural resource overview of the Olympic National Forest, Washington. Washington, DC: Jack McCormick & Associates, Inc.; contract 006709N. Submitted to U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Portland, OR. 253 p.

Rooney, J. 1997. Frontier legacy. Seattle, WA: Northwest Interpretive Association. 100 p.

Stocks, M. 2003. Quinault Indian Nation: comprehensive economic development strategy. Taholah, WA: Quinault Indian Nation. 82 p.

Tuchmann, E.T.; Connaughton, K.P.; Freedman, L.E.; Moriwaki, C.B. 1996. The Northwest Forest Plan: a report to the President and Congress. Washington, DC: U.S. Department of Agriculture, Office of Forestry and Economic Assistance. 253 p.

U.S. Bureau of the Census. 2000. Census 2000. http://www.census.gov/main/www/cen2000.html. (August 15, 2005).

U.S. Department of Agriculture, Forest Service [USDA FS] 2004. Olympic National Forest. http://www.fs.fed.us/r6/olympic. (August 21, 2004).

U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Bureau of Land Management [USDA and USDI]. 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].

U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Bureau of Land Management [USDA and USDI]. 2002. Tribal monitoring under the Northwest Forest Plan. Interagency executive letter. http://www.reo.gov. (August 2004).

Wilkinson, K.P. 1991. The community in rural America. New York: Greenwood Press. 152 p.

Appendix: People Interviewed for This Study

Olympic National Forest

Respondent's position[a]
Engineering program representative (3)
Forestry program representative (4)
District ranger (2)
Economic development representative
Public service representative
Forest planning representative
Forest supervisor
Aquatics program representative
Ecosystems/natural resources program representative
Wildlife biology program representative
Fire and aviation program representative
Operations staff representative
Timber contracting representative
Computer/mapping specialist
Botany/forest ecology program representative
Recreation program representative
Information specialist
Tribal relations representative

[a] Actual names and titles were removed to protect the confidentiality of interviewees.

Quilcene

Respondent's position[a]	Quilcene resident
Former logging contractor	X
Former logging contractor, business owner	X
Logging contractor, logging contractors' association	X
Local businessperson, recent immigrant (2)	X
Firefighter	X
Pastor	X
School official	X
County planning official (3)	
County planning official	X
Environmental interest group member	
Social service provider	X
Social service provider	
Economic development agency official	
County health and human services official (2)	
Industrial timberland manager	

[a] Actual names and titles were removed to protect the confidentiality of interviewees.

Forest Service employees working in Quilcene were also interviewed for the community case study and are included under the list of Forest Service employees interviewed.

Lake Quinault Area

Respondent's position[a]	Lake Quinault area resident
Former National Park Service employee, local tourism-based business owner	X
Elected county official	
Fire district representative	X
School official	X
Waitress, school board member	X
Owner of log truck company, pastor, member of community/economic development organization	X
President of local chapter of a national recreation organization	
Local tourism-based business owner, school board member	X
Retired rancher	X
Shake mill owner	X
Contractor for ecosystem management work on the forest	X
Representative from regional economic development organization	
Store owner	X
Representative from a regional environmental organization	

[a] Actual names and titles were removed to protect the confidentiality of interviewees.

Forest Service employees working at Lake Quinault were also interviewed for the community case study and are included under the list of Forest Service employees interviewed.

Quinault Indian Nation

Respondent's position[a]	Taholah/Queets resident
Quinault tribal council member, tribe member (2)	X
Quinault Indian Nation employee—forestry (2)	
Quinault Indian Nation employee—forestry, tribe member	X
Quinault Indian Nation employee—cultural historian, tribe member	X
Quinault Indian Nation employee—natural resources	
Retired logger, fisher, tribal elder	X
Basket weaver, tribal elder	X
School official	
Quinault Indian Nation employee—environmental protection	
Former Quinault Indian Nation employee—environmental protection	
Quinault Indian Nation employee—economic development	
Quinault Indian Nation employee—tribal liaison, tribe member	X
Basket weaver, Quinault Indian Nation employee—cultural historian, tribe member	X
Fisher, tribe member	X
Fisher, tribal elder	X

[a] Actual names and titles were removed to protect the confidentiality of interviewees.

Forest Service employees working at Lake Quinault were also interviewed for the community case study and are included under the list of Forest Service employees interviewed.

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