# Social and Economic Assessment of the Chugach National Forest Area

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## Abstract

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This is an assessment of the social and economic conditions in the Chugach National Forest area for use as background information for forest planning. Current regional conditions and recent trends are compared and contrasted with state and national conditions and recent trends. Regional employment and income trends in industries that use forest-related resources are detailed with a focus on their relation to forest management. Tourism and recreation is the industry likely to be most influenced by forest management policies.

The social and economic conditions in 14 communities, chosen because of their proximity to the forest, also are described. The results of two mail surveys designed to gain a better understanding of the communities' perceptions of themselves, their views about the management of the forest and other public lands, and the role of these lands in their quality of life also are presented and discussed. The survey results indicate that the communities are interested in the management of the forest and, because of the importance of public land to their quality of life, most wish to be equal partners with management agencies in planning for the future of these lands.



Keywords: Chugach National Forest, south-central Alaska, social and economic conditions, communities, community surveys.



## Summary

This document was prepared in support of the Chugach National Forest (CNF) revision of the 1984 Land and Resource Management Plan (forest plan). The assessment provides basic background descriptions and information for forest planners and the public to aid in their understanding of both qualitative and quantitative aspects of social and economic conditions in the area. Current conditions and recent trends in south-central Alaska are compared and contrasted with state and national conditions and recent trends. Regional employment and income trends in industries that use forest-related resources are detailed focusing on their relation to forest management.

The social and economic conditions in 14 communities, chosen because of their proximity to the forest, also are described. The results of two mail surveys designed to gain a better understanding of the communities' perceptions of themselves, their views about the management of the forest and other public lands, and the role of these lands in their quality of life also are presented and discussed. This summary begins with key findings from each section of the assessment followed by overall conclusions relevant to the management of the CNF, and suggestions for future research.

### Regional Social and Economic Conditions

**The population is increasing and aging—**Population is increasing in all three borough/census areas in south-central Alaska. It is increasing faster in communities in the Kenai Peninsula Borough than in the municipality of Anchorage and Valdez-Cordova Census Area. Similar to national ages, the median age increased in all three south-central Alaska areas between 1990 and 1998.

**Regional employment is increasing and diversifying, real per capita income is decreasing—**Total employment (measured in annual average equivalents) continues to grow at a faster relative rate in south-central Alaska (compared to the Nation) with the fastest relative rate in the Kenai Peninsula Borough, followed by the municipality of Anchorage and the Valdez-Cordova Census Area (which has shown slower growth than the Nation since 1992). Also similar to national trends, much of the increase

in employment has occurred in the services and retail trade sectors. The aging population and the large amount of tourism in south-central Alaska may be influences. Between 1977 and 1993, economic diversity increased in all three borough/census areas, but the Valdez-Cordova Census Area continues to be the least diverse. Because many of the services and retail trade sectors in south-central Alaska have a higher percentage of lower wage and seasonal jobs, as the percentage of total employment in these sectors has increased, the gap between real per capita income in south-central Alaska and the Nation has narrowed.

**Nonlabor income is increasing as a percentage of total income—**Similar to that of the Nation, earnings in south-central Alaska are decreasing as a percentage of total personal income while transfer payments and property income are increasing in percentage. In the Nation as a whole, transfer payments and property income are about the same percentage of total personal income, whereas transfer payments in Alaska's three south-central areas account for a larger percentage than property income. This is perhaps due to Alaska's Permanent Fund Dividend.

**Economic activity in the Valdez-Cordova area is the most variable—**Of the three borough/census areas, the Valdez-Cordova Census Area shows the most volatility in economic indicators such as total employment, real per capita income, and total personal income. This is perhaps due to its lower economic diversity and the larger relative significance of resource-dependent sectors (whose economic returns are heavily influenced by external market forces rather than state business cycles) in its economic structure.

## Forest-Resource-Related Industries

**The Chugach National Forest communities had more employment in forest-resource-related industries—**In 1996, communities within or near the CNF had a much larger percentage of employment in forest-resource-related industries as compared to Anchorage or the Kenai-Soldotna communities. Of Anchorage's total employment, about 6.1 percent was estimated to be in industries that use forest-related resources: commercial fish harvesting and seafood processing, logging and sawmills, minerals other than oil and gas, and the visitor industry. Of the 6.1 percent, the visitor industry was the largest component accounting for an estimated 5.4 percent of total 1996 employment. Forest-resource-related industry employment in the Kenai-Soldotna area (including Sterling) was estimated at 9.4 percent of total estimated employment in 1996. The visitor industry accounted for an estimated 5.4 percent of total employment, while commercial fishing and seafood processing accounted for an estimated 3.8 percent. Community employment in forest-resource-related industries within or near the CNF (Chenega Bay, Cooper Landing, Cordova, Girdwood, Hope, Moose Pass, Seward, Tatitlek, Valdez, and Whittier) accounted for an estimated 38.8 percent of total employment. The commercial fishing and seafood processing industry accounted for an estimated 23 percent of total employment, while the visitor industry accounted for an estimated 13.4 percent of the total employment.

**Forest management decisions likely to have largest impact on recreation and tourism industries—**The limited resource potential and high economic cost associated with accessing, extracting, and transporting wood fiber and mineral resources limit the impact forest management policies have on the overall level of economic activity in the wood products and mineral industries. Although commercial fishing is an important contributor to economic activity in two of the three subregions, the effects of forest management activities on it are mainly limited to impacts on the freshwater habitat of salmon. Currently, these impacts are small relative to other influences on the industry, such as external market forces. The industries likely to be most influenced by forest management policies are the recreation and tourism industries. Because of this influence and the importance of these industries in local economic structures, three other assessments (Brooks and Haynes 2001, Bowker 2001, Colt 2002) were commissioned to analyze the current and future outlook for these industries in south-central Alaska and their relation to CNF resources and management activities.

## Social and Economic Conditions in the Communities

**Although no two communities have identical demographic or economic characteristics, similarities exist between groups of communities—**The largest communities also had the highest employment diversity scores, whereas the smallest communities had the lowest employment diversity scores. The larger and more economically diverse communities of Anchorage, Kenai, Soldotna, and Valdez will probably not experience significant changes in their overall level of economic activity from forest management changes. They could, however, experience indirect economic and social effects from changes that impact their quality of life such as changes in recreation opportunities. Because of the spruce bark beetle infestation, the Kenai Peninsula communities share a common concern about fires that may potentially endanger structures or landscapes. Forest managers should make this issue a high priority.

**Forest management activity near Chenega Bay, Tatitlek, or Hope is likely to have greater community-level economic and social impacts—**These communities had the largest percentages of people below poverty level as well as high percentages of people who were either unemployed or not in the labor force. They also had low economic diversity scores, low median incomes, and subsistence preference. Chenega Bay and Tatitlek are Alaskan Native communities.

**The Whittier community will likely experience the most change in the near future—**This change is driven by the anticipated increase in visitors to the community on completion of the Whittier road. This road represents the first land link other than the railroad between Whittier and Anchorage. The other communities in Prince William Sound also are concerned about increased usage of the sound associated with the new road.

## Community Surveys

**Respondents indicated an interest in preserving wild and scenic areas while welcoming minimal growth needed for anticipated increased use of Prince William Sound—**Generally, respondents indicated they would like to see an increase in the amount of congressionally designated wilderness and wild and scenic rivers; the current amount or less timber harvesting; construction of a few roads on CNF land; and minimal expansion of facilities to mitigate anticipated increased use of Prince William Sound. A majority of respondents in all communities indicated they prefer that five or more rivers in the CNF be congressionally designated as wild and scenic. A majority of respondents in 9 of the 12 communities (with the exception of Hope, Soldotna, and Sterling) indicated that they prefer that 1.7 million acres or more of the CNF be congressionally designated as wilderness.

A majority of respondents in all communities indicated a preference for an annual timber harvest at or below 2.1 million board feet, or the past 13-year average annual cut on the CNF. Among possible reasons to log in the CNF, removal of dead or infested trees, fire prevention and protection of life and property, and creation of wildlife habitat were the most acceptable reasons to respondents in all communities.

A majority of respondents in 8 of the 12 communities (with the exception of Anchorage, Kenai, Soldotna, and Sterling)—including all three communities in Prince William Sound—indicated that the proper management response to increased use of the sound owing to the new Whittier road is to develop minimal new facilities to mitigate impacts rather than create more facilities to enhance use.

A majority of respondents in all communities indicated a preference for creating five or fewer new roads in the CNF. Among possible reasons to construct new roads in the CNF, vegetation management was the reason respondents chose most in 9 of the 12 communities (with the exception of Cordova, Valdez, and Whittier).

**Respondents generally favored the current amount of open area and season in the CNF for snowmachine and off-road vehicle use—**A majority of respondents in 10 of the 12 communities (with the exception of Sterling and Valdez) indicated a preference for the current amount of open area and season in the CNF for snowmachine use. More communities secondarily preferred increased access than preferred decreased access. A majority of respondents in 10 of the 12 communities (with the exception of Anchorage and Valdez) indicated a preference for the current amount of open area and season in the CNF for off-road vehicle use. An equal number of communities secondarily preferred increased access than preferred decreased access.

**Respondents generally rated less consumptive and noncommercial forest uses highest**—In general, respondents favored recreational and biological ecosystem values over economic values thus rating forest uses that protect these values highest. Among 13 different forest ecosystem values recognized as present in the CNF, recreation, life support, aesthetic, and subsistence values received the most consistently high ratings among respondents in all communities. Among 19 different forest uses, a majority of respondents in all of the communities generally favored nonconsumptive, low-impact forest uses (e.g., fish and wildlife habitat, camping and picnicking, and nonmotorized recreation) over consumptive, higher impact forest uses (e.g., commercial mining, oil and gas, and logging)—although none of the uses were substantially opposed.

**Respondents generally indicated they were very interested in CNF management wanting equal representation in management decisions with preference given more to local rather than national interests—**A majority of respondents in every community indicated that they were very interested in what happens to the CNF in the next 10 to15 years. A majority of respondents in every community also indicated that they believed the public should be a full and equal partner in decisionmaking with regard to planning for the CNF. Finally, a majority of respondents in 9 of the 12 communities (with the exception of Anchorage, Cooper Landing, and Whittier) felt that local community interests deserved more attention than national interests when planning for the use of public lands near their communities.

**Respondents rely on public lands to maintain their quality of life—**In all communities, at least two of the top five factors ranked most important to quality of life were related to public lands or were affected by public land management activities (public land factors, or PLFs). Survey respondents indicated that the three PLFs most important to their quality of life were (1) clean air and water, (2) beauty of the surrounding area, and (3) open undeveloped areas. These were also the three PLFs respondents were most satisfied with. The three PLFs respondents were least satisfied with were (1) the roads and transportation system (2) access to and use of public lands, and (3) subsistence hunting and fishing.

Of 19 public land uses (opportunities), the uses with the highest average importance ratings across communities were (1) fishing, (2) hunting, and (3) undeveloped land and wilderness. The lowest average importance ratings were for (1) trapping, (2) all-terrain vehicle and off-road vehicle areas, and (3) scenic drives. The uses with the highest average satisfaction ratings across communities were (1) scenic landscapes and (2) viewing wildlife, while the lowest average satisfaction ratings were for (1) jobs from logging and mining, (2) access for disabled people, and (3) all-terrain vehicle and off-road vehicle areas.

**Respondents generally favored no change in their community's current amount of economic activity in the forest-resource-related sectors—**In every community, the response chosen most often regarding the desired future level of local economic activity in the mining sector was no change. In 9 out of the 12 communities, the response chosen most often for the oil and gas sector was no change. For the forestry and forest products sector, the response chosen most often in eight communities was

no change. No change was also the response chosen most often in 7 out of the 12 communities for both the commercial fishing sector and the tourism services sector. Whittier, Anchorage, Cordova, Valdez, and Girdwood each had a majority of respondents favoring an increase in the tourism services sector. In terms of overall economic activity, more respondents from Whittier, Kenai, Anchorage, and Valdez appeared to favor additional growth in their communities, whereas Hope, Cooper Landing, Girdwood, and Moose Pass had the fewest respondents in favor of growth.

There appears to be a positive relation between quality-of-life ratings and community resiliency ratings for the CNF communities of interest. The self-assessed overall average quality-of-life rankings by community for the CNF communities were (from highest to lowest) Girdwood, Cooper Landing, Moose Pass, Hope, Sterling, Anchorage, Cordova, Seward, Kenai, Valdez, Soldotna, and Whittier. Community resiliency rankings for the CNF communities of interest were (from highest to lowest) Cooper Landing, Moose Pass, Anchorage, Girdwood, Seward, Hope, Cordova, Soldotna, Kenai, Valdez, Sterling, and Whittier. The three communities rated highest in terms of quality of life (Girdwood, Cooper Landing, and Moose Pass) also were rated in the top four for community resiliency, whereas three of the four communities rated lowest in terms of quality of life (Whittier, Valdez, and Kenai) also ranked in the bottom four for community resiliency.

## Conclusions

We offer several management suggestions based on our findings. First, because most forest-resource-related employment in the communities of interest around the Chugach National Forest occurs in the tourism and recreation and fishing and seafood processing industries, management strategies that protect or enhance the resources that support these industries should continue to sustain such employment. Protecting these resources also should protect many of the quality-of-life factors related to public land management that were rated high by survey respondents. Second, the survey results strongly indicate that both residents of CNF communities of interest and other Alaska residents rate the amenity values of the CNF higher than the commodity values. Thus, managing with an emphasis on the former ecosystem values rather than the latter should be in the interest of both the local and state publics. Third, the aging of the population (both locally and nationally) combined with survey results indicating the local public's desire for better access to the CNF as well as a better road and transportation system suggest that improvements in this area also would serve the public interest.

Fourth, concerning management activities near particular communities, activities that enhance growth would be desirable near those communities that favor additional growth: Whittier, Kenai, Anchorage, and Valdez. Activities that limit growth appear appropriate for Hope, Cooper Landing, Girdwood, and Moose Pass. Fifth, based on the following combination of indicators—the employment diversity score, the percentage of the population below poverty level, the median household income, the percentage of the population that is Alaskan Native, the civilian unemployment rate, and the percentage of adults not in the labor force—the communities of Chenega Bay, Tatitlek, and Hope are communities that may be the most susceptible to adverse social and economic effects (on minority and low-income communities) from forest management activities. Finally, the community of Whittier, which had both the lowest community resiliency and quality-of-life score, is also the community likely to face the greatest change in the near future because of the opening of a new road to Prince William Sound. Forest management strategies that allow for at least some expansion of facilities on the CNF to accommodate the increased use of areas near Whittier would probably mitigate some of the congestion and associated problems this community will endure as both locals and tourists funnel through the area.

## Future Research

Because of the timing of this assessment, much of the data on which the description of social and economic conditions in the CNF communities of interest was based are 10 years old. A reevaluation of community conditions after the 2000 census would give forest managers a better understanding of current community conditions. Additionally, periodic community and statewide random surveys, similar to those undertaken for this assessment, would keep forest managers abreast of changing conditions, values, and preferences for forest management activities. Developing methods to increase response from Alaskan Native communities should be a priority. Finally, research that would allow comparisons of local versus national values and preferences for the management of the CNF and other public lands could aid decisionmakers in balancing these interests in their management strategies.

# Contents

# Introduction

Ecosystem management is an ecological approach to land management that the USDA Forest Service uses to achieve its mandate of multiple use on the national forests. Ecosystem management combines the needs of people and their environmental values with physical and biological elements to maintain diverse, productive, and sustainable ecosystems. As a part of an ecosystem, human conditions are shaped by it, and in turn, shape the ecosystem. The physical and biological parts of an ecosystem offer opportunities and impose limits for people. One area may provide settings and resources for efficient human use or enjoyment, whereas another area may impose barriers preventing use owing to costs greater than potential benefits. A critical element in successful ecosystem management is understanding the role of humans within the ecosystem structure and function. Blending the dynamic human condition with the biological and physical resources will help create a credible and inclusive planning process.

The human story, or dimension, of an ecosystem is complex and dynamic. The more information we have on the social, economic, and cultural aspects of the citizenry, the richer the story we can tell concerning the general public and their demand for forest resources. By concentrating on the general public more than the few outspoken groups who have extreme or vested interests in forest resources, we hope that the planning process will result in better decisions.

This human story should be told at several scales, from global to local. Information from a larger area may mask important concerns and trends in a smaller area. It is also important to tell the story from the past, to the present, and into the future. Trends, changes, and growth in an area are important to consider so that decisions are based on dynamic, not static, conditions. The perspective that the current situation is continually changing provides context for future decisions.

In telling the story, many variables, both quantitative and qualitative, are considered. This information was collected from many different sources. It is important to note, however, the assumptions made in both collecting and reporting the data. Not all data are comparable, available at the scales desired, or complete. In the following analysis, data are introduced and assumptions are given to allow the reader to interpret the story told within the context of the data.

This analysis provides a description of the social and economic environment and trends in the south-central Alaska region surrounding the Chugach National Forest (CNF). This comprehensive description of social and economic conditions is similar to the more traditional resource inventories done for such concerns as recreation, vegetation, wildlife, fish, and soils. This assessment provides forest planners and the general public with basic background descriptions and information about the human environment that will aid them in evaluating the potential effects of forest management decisions on the human dimension of the ecosystem. The assessment is not intended to be an analysis of the effects of specific forest management strategies or policies.

## Social and Economic Resources of the Chugach National Forest

The present boundaries of the CNF were adjusted six times between 1907 and 1980. The forest is now 210 miles long and 120 miles wide and, at 5.4 million acres, is about the size of the state of New Hampshire. It extends south and east of Anchorage along the south-central Alaska coast, encompassing most of Prince William Sound, the northeast portion of the Kenai Peninsula (including all of the Seward Highway), and the Copper River Delta. The Seward Highway provides access to the western side of the forest bringing visitors from Anchorage into the Kenai Mountains and to the Prince William Sound via the town of Whittier. Valdez is accessible from the interior via the Richardson Highway; Chenega Bay, Cordova (includes Eyak), Seward, Tatitlek, Valdez, and Whittier are accessible by the Alaska state ferry system.

To complete a social and economic assessment of the CNF, it is necessary to answer the question: What areas are most likely to be impacted

by forest management actions? Fourteen communities are included within the boundary of the analysis area defined for the purpose of this assessment as south-central Alaska: Anchorage, Chenega Bay, Cooper Landing, Cordova (includes Eyak), Girdwood, Hope (includes Sunrise), Kenai, Moose Pass, Seward, Soldotna, Sterling, Tatitlek, Valdez, and Whittier. The communities with larger and more diverse economic structures, such as Anchorage, Kenai, Soldotna, and Sterling, are more likely to be impacted in terms of the social benefits they derive from the forest. The smaller communities and those within the CNF boundaries may experience both social and economic impacts.

Different segments of the local population use, process, and consume various resources of the CNF. Residents of south-central Alaska depend on the wildlife and fish in the forest as well as other natural resources for both subsistence purposes and cultural survival. South-central Alaska residents account for much of the recreation activity on the CNF, although nonresident tourism may be increasing at a faster rate (Colt and others 2002). Timber from the CNF provides a small part of the regional fiber supply for the local wood products industry. The forest also contains many of the salmon streams in the region, which are an essential component in the sizable regional salmon fishery and fish processing industry.

## Organization of the Assessment

The following assessment is composed of four sections describing the social and economic conditions and trends in south-central Alaska. Note that our purpose is to describe existing social and economic conditions and recent trends and not to forecast the future.[1] The first section is a regional assessment that serves as an overview of the study area, including the three main political jurisdictions around the CNF—the municipality of Anchorage, the Kenai Peninsula Borough, and the Valdez-Cordova Census Area. Although the 14 communities of interest are within these three areas, other communities not included in the study area lay within these borough/census area boundaries.

The second section is a description of employment and income trends in industries that utilize forest-related resources. Four principal industries most associated with the CNF are analyzed: wood products, commercial salmon fishing and processing, recreation and tourism, and mineral exploration and production. Descriptions of the industries, current industry issues, and the relation between forest management and each industry are discussed.

The third section is an assessment of the social and economic conditions of the 14 individual communities. We used many sources of secondary data to provide descriptions of the individual communities and to enable comparisons among them in our assessment. In the final section, the results from two mail surveys designed to gain a better understanding of community perceptions of themselves, their views about the management of the CNF and other public lands, as well as the role of these lands in their quality of life, are presented and discussed.

## Section 1: Regional Social and Economic Conditions

Anchorage is the largest population center in the state. Its economic activity is often more reflective of trends within Alaska as a whole than is the economic activity in the smaller areas of the Kenai Peninsula and Valdez-Cordova. When looking at economic trends, smaller area trends and local conditions may be swamped by the dominance of Anchorage's economic activity. For this reason, it is important to examine conditions and identify trends for each of the three borough/census areas individually.

[1] We display 10-year projections for selected variables taken from reports by Goldsmith (1998, 1999).

**Table 1—Population characteristics compared for the United States and Alaska, 1990 and 1998**

| Variable | United States | | Alaska | | Municipality of Anchorage | | Kenai Peninsula Borough | | Valdez-Cordova Census Area | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1990 | 1998 | 1990 | 1998 | 1990 | 1998 | 1990 | 1998 | 1990 | 1998 |
| Population: | 248,709,873 | 270,028,937 | 550,043 | 621,400 | 226,338 | 258,782 | 40,802 | 48,815 | 9,952 | 10,365 |
| Percentage of the state (%) | -- | -- | 100 | 100 | 41 | 43 | 7 | 8 | 2 | 2 |
| Caucasian (%) | 84 | 83 | 76 | 74 | 82 | 78 | 91 | 90 | 83 | 81 |
| Native American (%) | 1 | 1 | 16 | 17 | 7 | 8 | 7 | 7 | 13 | 14 |
| African American (%) | 12 | 13 | 4 | 4 | 7 | 7 | 1 | 1 | 1 | 1 |
| Asian-Pacific Islander (%) | 3 | 4 | 4 | 5 | 5 | 7 | 1 | 2 | 3 | 4 |
| Hispanic origin, any race (%) | 9 | 11 | 3 | 5 | 4 | 7 | 2 | 3 | 3 | 2 |
| Persons per square mile | 70.3 | 76.4 | 1.0 | 1.1 | 133.3 | 152.4 | 2.5 | 3 | .3 | .3 |
| Persons per household | 2.6 | 2.6 | 2.8 | 2.7 | 2.7 | 2.6 | 2.8 | 2.6 | 2.7 | 2.6 |
| Median age | 32.8 | 34.9 | 29.2 | 32.4 | 29.6 | 32.1 | 31 | 35.4 | 31.8 | 36.6 |
| Males to 100 females | 95 | 96 | 111 | 108 | 106 | 105 | 112 | 109 | 122 | 115 |
| Education, persons 25 or older: | | | | | | | | | | |
| High school degree or higher | 75.2 | 82.8 | 86.6 | NA | 90.4 | NA | 87.2 | NA | 83.9 | NA |
| Bachelor degree or higher | 20.3 | 24.4 | 23 | NA | 26.9 | NA | 17.9 | NA | 18.5 | NA |

NA = not available.
-- = not applicable.
Sources: Alaska Department of Labor, Research and Analysis 1999a; U.S. Department of Commerce, Bureau of the Census 1990.

## Population and Demographics

The state of Alaska represents about 0.23 percent of the U.S. population. It is ranked 48th in population followed by Wyoming and Vermont. Alaska is the largest of the 50 states and accounts for 16 percent of the U.S. land base. In comparison, the second largest state, Texas, has 7 percent of the U.S. land base. Because of the large land area, the large amount of federal land ownership (66 percent), and the small population, Alaska's population density is significantly lower than that of the United States as a whole. Table 1 displays 1990 and 1998 population data for the United States, Alaska, and the three borough/census areas surrounding the CNF.

Of the three areas surrounding the CNF, the municipality of Anchorage is the smallest in terms of land area. Although occupying less than 1 percent of Alaska's total land area, it contains about 43 percent of the state's population. The Kenai Peninsula Borough and the Valdez-Cordova Census Area together contain about 10 percent of the state's population and almost 10 percent of the state's land base. The differences in size and population among the three areas are reflected in population density figures. Anchorage has a higher population density than the Kenai Peninsula Borough or Valdez-Cordova Census Area. At 152.4 persons per square mile, the population density of Anchorage is higher than the state average of 1.1 and the national average of 76.4. At the other end of the spectrum, the Valdez-Cordova Census Area has a population density of 0.3 persons per square mile, owing to the large amount of federally owned land and the lack of road access to communities within the census area.

Within Alaska and the three south-central Alaska areas, minority populations increased between 1990 and 1998. By comparison, the Alaska Native

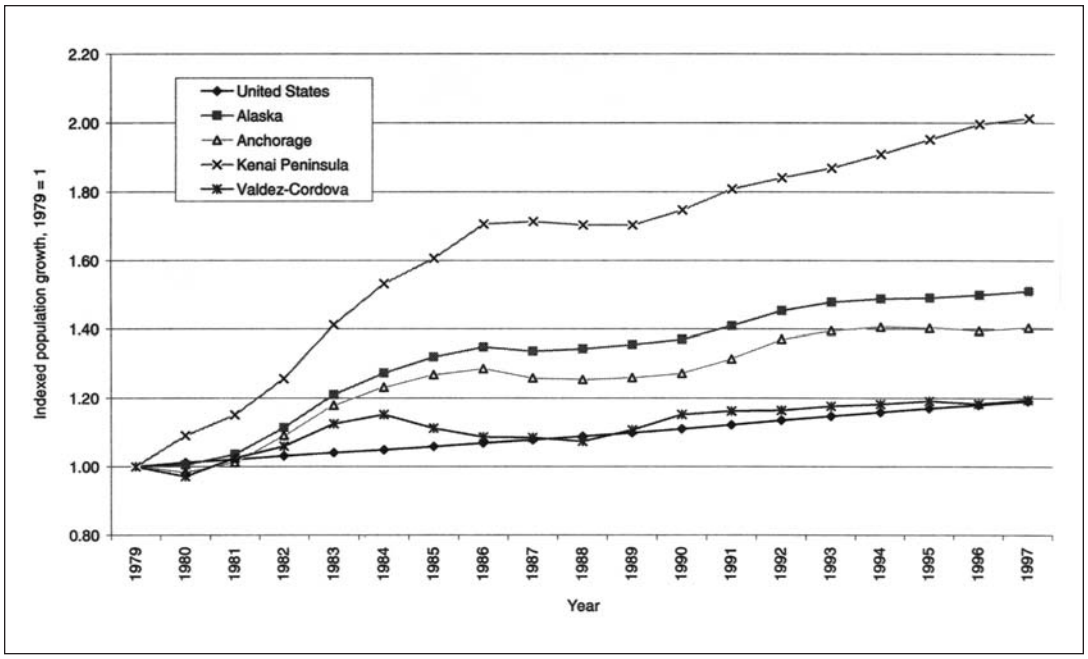


Figure 1—Population trends for the United States, Alaska, and south-central Alaska, 1979-97, indexed to 1979 (U.S. Bureau of Economic Analysis 1999).

population within Alaska is a greater proportion than the Native American population of the United States. Rural Alaska tends to have a greater percentage of natives. Anchorage has a smaller Alaska Native percentage than the state average, whereas the Valdez-Cordova Census Area has the highest percentage. Anchorage has a larger percentage of Asian-Pacific Islanders within its population than the United States average.

Alaska is generally following the national trend in terms of an aging population and the male-to-female ratio. The median age of the state's population increased between 1990 and 1998, from 29.2 to 32.4 years. The ratio of males to females also is moving toward the national average, although rural areas continue to have a higher percentage of males than females. This is especially true for areas with logging camps, active mines, or other resource processing facilities, which have traditionally employed primarily males.

In 1990, Alaska had a higher percentage of persons 25 years or older with a high school degree or higher, as well as a higher percentage of persons in this age group with a bachelor's degree or higher than the U.S. percentages. This is perhaps an indication that career opportunities in the state require a higher degree of education, or that people with more education are moving to Alaska for lifestyle reasons. Within south-central Alaska, Anchorage had higher percentages in both these categories than the state percentages in 1990, whereas the Kenai Peninsula Borough had a higher percentage than the state in the first category but a lower percentage in the second category, and the Valdez-Cordova Census Area percentages were lower than the state percentages for each category.

**Population change**—There are two components of population growth: (1) natural increase or decrease (births and deaths) and ( 2) migration. Natural changes in population are fairly stable as death and birth rates tend to change slowly. Migration, however, is less stable, changing with economic opportunities in the state. The number of people who move to Alaska from other states or countries (inmigration) increases during times of economic growth. Recent examples include the 1973-75 Trans-Alaska Pipeline construction period, and the 1980-85 economic boom created

through state spending of oil revenues. The opposite occurs during economic recessions. Alaska experienced outmigration during economic recessions in 1977 through 1980 and 1985 through 1989 as people left the state in search of better economic opportunities. Recently, better economic opportunities in the lower 48, combined with Alaska's lack of income growth and continued high cost of living, have slowed inmigration to the state (Alaska Department of Labor 1999a).

Figure 1 displays trends in resident population growth for 1979 through 1997, indexed to 1979. The use of an index allows for comparisons of changes between areas on a relative scale rather than in absolute magnitudes. Actual populations are displayed and discussed in the community assessment section of this document. Although the index is useful in comparing areas over time, it is difficult to select an index year that is completely neutral. Throughout this analysis, the index year 1979 is used because it is the first year population data are available for the current boundaries of all three areas. The year 1979 marks a point between a recession and a boom period. The selection of a different index year would probably change the overall comparisons if a year during a low point in a recession or a high point in a boom period was chosen.

The U.S. population grew at a steady rate from 1979 to 1997. During this same period, the Alaska population grew steadily except for a decline in the mid-1980s because of an economic recession. These same trends were mirrored in the municipality of Anchorage. Although the Kenai Peninsula Borough followed state trends in the late 1980s with a small decline in population, it has since shown significant growth and is currently the fastest growing of the three borough/census areas surrounding the CNF. The Kenai Peninsula Borough experienced an annual average growth rate of 2 percent between 1990 and 1997, larger than the state average of 1.4 percent during the same period. The Valdez-Cordova Census Area experienced population declines during the recession of the mid-1980s and had a slower recovery than the other areas.

## Employment

In this analysis, all employment figures are measured in annual equivalents, or the yearly average of all full- and part-time jobs. A person who works 12 months at a full-time job is counted as one job. A person who works three seasonal or part-time jobs during the year would be counted as three jobs. This measure is not the same as a full-time equivalent (FTE). An FTE is equal to one person working full time for 12 months; three people each working full time for 4 months would be counted as a single FTE. In considering the employment data presented, the annual equivalent count may overstate or understate some sectors depending on its level of seasonal or part-time hiring. The trends we present, however, still offer a consistent and informative account of the employment situation in the study area.

Some basic employment statistics for 1997 are displayed in table 2. Nonfarm employment is defined as all employment, both full and part time, not associated with farming. Government data made available to the public are subject to nondisclosure rules. This applies when the data reported may disclose the operations of a single firm.

The distribution of employment by industry sector in Alaska shows some significant differences from the United States as a whole. The agriculture-forestry-fishing (AFF) sector percentage is significantly higher in Alaska and in the south-central Alaska region owing to large commercial fishing and seafood processing operations. The mining sector, which includes all hard rock mining as well as oil and gas operations, and the transportation, public utilities, and communications (TPUC) sector, each comprise a larger percentage of employment in south-central Alaska and the state as a whole than they do in the rest of the United States. The largest difference in employment distribution is in the government sector, which includes all local, state, and federal employment. Alaska has 10 percent more of its total nonfarm employment in this sector than the Nation as a whole. The higher percentage of

**Table 2—1997 employment by industry, for the United States, Alaska, and south-central Alaska**

| Nonfarm employment by sector[a] | United States | Alaska | South-central Alaska | Municipality of Anchorage | Kenai Peninsula | Valdez-Cordova |
|---|---|---|---|---|---|---|
| | | | *Percent* | | | |
| AFF | 1.3 | 3.9 | 2.5 | 1.5 | 7.8 | 9.1 |
| Mining | .5 | 3.0 | 2.6 | 2.3 | 4.9 | (D) |
| Construction | 5.4 | 5.1 | 5.5 | 5.5 | 6.2 | 4.4 |
| Manufacturing | 12.6 | 4.8 | 2.9 | 1.7 | 9.0 | 10.2 |
| TPUC | 4.9 | 7.7 | 8.5 | 8.6 | 5.9 | 15.5 |
| Wholesale trade | 4.7 | 2.6 | 3.6 | 3.9 | 2.2 | (D) |
| Retail trade | 17.2 | 16.2 | 17.2 | 17.4 | 17.4 | 12.2 |
| FIRE | 7.6 | 5.3 | 6.3 | 6.8 | 4.2 | 2.2 |
| Services | 31.4 | 30.0 | 29.3 | 30.2 | 24.8 | 24.1 |
| Government | 14.2 | 24.5 | 21.4 | 22.1 | 12.5 | 20.4 |

(D)= not available due to nondisclosure rules.
[a] Sectors defined according to Standard Industry Classification Manual (1987):
*AFF (agricultural, forestry, and fishing services)* includes businesses engaged in agricultural production, forestry, commercial fishing, hunting and trapping, and related services.
*Mining* includes the extraction of minerals occurring naturally, quarrying, well operations, milling, preparation at the mine site, and exploration and development of mineral properties.
*Construction* includes new work, additions, alterations, reconstruction, installations, and repairs of structures.
*Manufacturing* includes the processing of materials (products of agriculture, forestry, fishing, mining, and quarrying) into new products. Examples include food, textiles, lumber, wood products, furniture, paper, machinery, and appliances.
*Retail trade* includes selling goods for personal or household consumption and rendering services incidental to the sale of the goods. Examples include groceries, hardware, drug store, and other specialty stores.
*Wholesale trade* includes selling goods to retailers or other wholesalers. Wholesalers maintain inventories of goods, extend credit; physically assemble, sort, and grade goods in large lots, break bulk goods into smaller lots, and advertise.
*FIRE (finance, insurance, and real estate)* includes business that operate in the fields of finance, insurance, and real estate, such as banks, investment companies, insurance agents and brokers, real estate buyers, sellers, and developers.
*Services* includes businesses engaged in providing a wide variety of services for individuals, business, government, and other organizations. Examples include hotels; health, legal, engineering, and professional services; and educational institutions.
*TPUC (transportation, public utilities, and communications)* includes passenger and freight transportation, communications services, electricity, gas, steam, water and sanitary services, and all establishments of the United States Postal Service.
*Government* includes all federal, state, and local government employees involved in executive, legislative, judicial, administrative, and regulatory activities.
Source: U.S. Bureau of Economic Analysis 1999; U.S. Department of Commerce, Bureau of the Census 1999.

employment and higher average earnings in this sector make government an important part of Alaska's economy.

In terms of total employment, Alaska and most of the south-central Alaska region have grown at a faster rate than the Nation. The United States has grown steadily, whereas Alaska has followed a boom-and-bust cycle. Figure 2 displays the general growth trends of the United States, Alaska, and the borough/census areas. This is an index of employment with 1979 as the index year, not actual employment numbers. Using an index allows trends between the areas to be compared without reference to the absolute magnitude of total employment figures.

Trends in employment are often related to population trends, showing a similar pattern of growth from 1980 to 1985 followed by a decline from 1985 to 1989. The Kenai Peninsula has continued to grow since the late 1980s as employment opportunities and population increased faster than the state and national growth rates.

Although growth patterns in the five areas are not identical, growth in both the services and retail trade sectors is a common trend in all areas (U.S. Bureau of Economic Analysis 1999). In Alaska, this trend may be influenced by the growth in tourism as well as the aging of the population. Because employment opportunities in

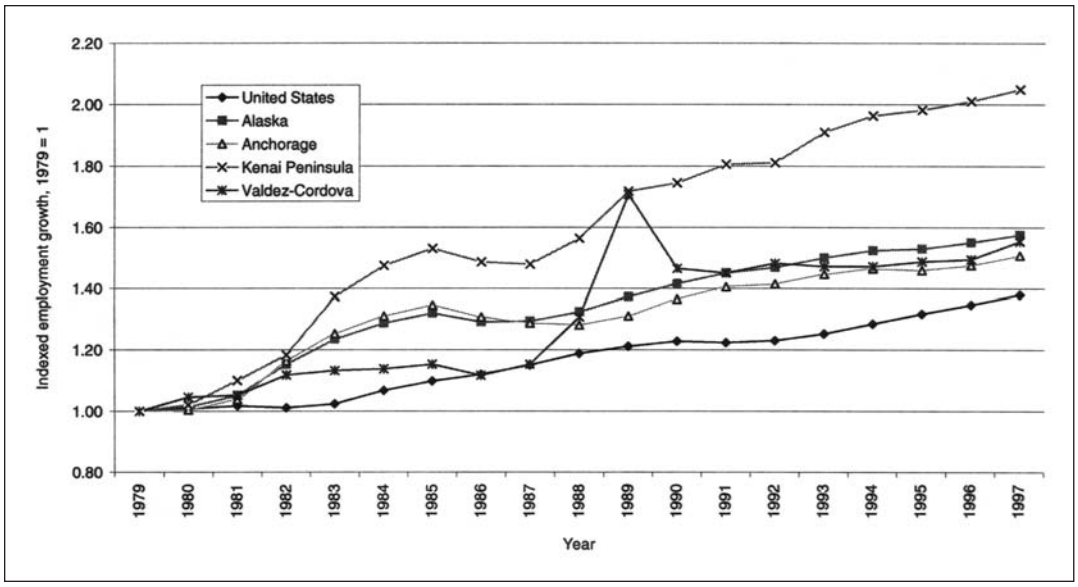


Figure 2—Total employment trends for the United States, Alaska, and south-central Alaska, 1979-97, indexed to 1979 (U.S. Bureau of Economic Analysis 1999).

these sectors are often associated with lower average earnings than in other industries, this trend may result in a reduction in overall average earnings in the state and local areas.

During past boom-and-bust periods in the state, the construction; retail trade; services; and finance, insurance, and real estate (FIRE) sectors were most affected. The other sectors appear to be more influenced by market forces outside of Alaska than by economic cycles within the state.

## Shift-Share Analysis of Employment Growth[2]

Shift-share analysis is useful for evaluating employment changes in the borough/census areas over a given period. Such analysis highlights important differences in the industry composition of employment growth in these smaller regions versus growth in the Nation and state atlarge. Before conducting shift-share analysis for the individual areas, we first present the changes in employment by major industry group for the Nation and the state of Alaska for the period from 1990 to 1997, in tables 3 and 4. This period was chosen because 1990 was the last census year and 1997 was the most recent year that these employment data were available. This period is similar to the period used to analyze recent demographic changes in the Nation, the state, and the three borough/census areas.

The first four columns in table 3 present employment levels and percentage share of total nonfarm employment for 1990 and 1997 by major industry sector for the Nation as a whole. The last two columns report the percentage and net change in the total number of jobs percentage increase in employment occurred in the decrease was in the government sector. The greatest retail trade sector (30.0 percent), whereas the largest absolute increase was in the services sector (22,431) for each industry sector. The percentage change results by industry allow us to distinguish between the faster and slower growing sectors irrespective of their relative importance. The net change results highlight those sectors that contributed most to the total net change. The overall national growth rate in nonfarm employment for the period was 12.8 percent. All sectors except mining and manufacturing had increases in employment, with the AFF sector having the largest percentage increase (35.8 percent) and the services sector having the largest absolute

[2] The method and definitions used here are from Smith (1999).

**Table 3—United States employment change, 1990-97**

| | Employment | | | | Actual growth in employment | |
|---|---|---|---|---|---|---|
| | 1990 | | 1997 | | | |
| Sector[a] | Level | Share | Level | Share | Percent | Net |
| AFF | 1,452,400 | 1.1 | 1,972,400 | 1.3 | 35.8 | 520,000 |
| Mining | 1,042,900 | .8 | 832,500 | .5 | -20.2 | -210,400 |
| Construction | 7,264,000 | 5.3 | 8,365,700 | 5.5 | 15.2 | 1,101,700 |
| Manufacturing | 19,634,600 | 14.4 | 19,415,800 | 12.7 | -1.1 | -218,800 |
| TPUC | 6,560,600 | 4.8 | 7,550,200 | 4.9 | 15.1 | 989,600 |
| Wholesale trade | 6,651,900 | 4.9 | 7,177,800 | 4.7 | 7.9 | 525,900 |
| Retail trade | 22,840,700 | 16.8 | 26,355,900 | 17.2 | 15.4 | 3,515,200 |
| FIRE | 10,695,600 | 7.9 | 11,778,300 | 7.7 | 10.1 | 1,082,700 |
| Services | 38,662,900 | 28.4 | 48,227,800 | 31.4 | 24.7 | 9,564,900 |
| Government | 21,232,000 | 15.6 | 21,780,000 | 14.2 | 2.6 | 548,000 |
| Total | 136,039,590 | | 153,458,397 | | 12.8 | 17,418,807 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

**Table 4—Alaska employment change, 1990-97**

| | Employment | | | | Actual growth in employment | |
|---|---|---|---|---|---|---|
| | 1990 | | 1997 | | | |
| Sector[a] | Level | Share | Level | Share | Percent | Net |
| AFF | 13,894 | 4.1 | 14,708 | 3.9 | 5.9 | 814 |
| Mining | 12,543 | 3.7 | 11,239 | 2.9 | -10.4 | -1,304 |
| Construction | 15,789 | 4.6 | 19,409 | 5.1 | 22.9 | 3,620 |
| Manufacturing | 18,932 | 5.5 | 18,293 | 4.8 | -3.4 | -639 |
| TPUC | 24,580 | 7.2 | 29,316 | 7.7 | 19.3 | 4,736 |
| Wholesale trade | 8,636 | 2.5 | 9,836 | 2.6 | 13.9 | 1,200 |
| Retail trade | 47,096 | 13.8 | 61,237 | 16.1 | 30.0 | 14,141 |
| FIRE | 20,321 | 5.9 | 20,014 | 5.3 | -1.5 | -307 |
| Services | 79,757 | 23.3 | 102,188 | 26.8 | 28.1 | 22,431 |
| Government | 98,768 | 28.9 | 92,783 | 24.4 | -6.1 | -5,985 |
| Total | 342,306 | | 381,020 | | 11.3 | 38,714 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

increase (9,564,900). Table 4 is an analogous table for the state of Alaska. The overall growth rate of nonfarm employment in Alaska during the same period was 11.3 percent. The mining, government, manufacturing, and FIRE industries had decreases in employment. The largest percentage decrease occurred in the mining sector (-10.4 percent), whereas the largest absolute decrease was in the government sector. The greatest percentage increase in employment occurred in the

**Table 5a—Municipality of Anchorage employment change, 1990-97**

| Sector[a] | Employment | | | | Actual growth in employment | |
|---|---|---|---|---|---|---|
| | 1990 | | 1997 | | | |
| | Level | Share | Level | Share | Percent | Net |
| AFF | 2,197 | 1.4 | 2,549 | 1.5 | 16.0 | 352 |
| Mining | 5,914 | 3.8 | 4,024 | 2.3 | -32.0 | -1,890 |
| Construction | 7,877 | 5.1 | 9,376 | 5.5 | 19.0 | 1,499 |
| Manufacturing | 2,854 | 1.8 | 2,889 | 1.7 | 1.2 | 35 |
| TPUC | 12,511 | 8.0 | 14,724 | 8.6 | 17.7 | 2,213 |
| Wholesale trade | 6,026 | 3.9 | 6,810 | 4.0 | 13.0 | 784 |
| Retail trade | 23,885 | 15.4 | 29,932 | 17.4 | 25.3 | 6,047 |
| FIRE | 12,449 | 8.0 | 11,610 | 6.8 | -6.7 | -839 |
| Services | 42,069 | 27.0 | 51,786 | 30.2 | 23.1 | 9,717 |
| Government | 39,754 | 25.6 | 37,925 | 22.1 | -4.6 | -1,829 |
| Total | 155,536 | | 171,625 | | 10.3 | 16,089 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

retail trade sector (30.0 percent), whereas the largest absolute increase was in the services sector (22,431).

**Municipality of Anchorage shift-share analysis—**Table 5a mirrors tables 3 and 4 for the municipality of Anchorage. Overall nonfarm employment in Anchorage increased by 10.3 percent. The mining, FIRE, and government sectors had decreases in employment between 1990 and 1997. The largest percentage and absolute decrease occurred in the mining sector (-32 percent and -1,890). The largest percentage increase in employment was in the retail trade sector (25.3 percent), whereas the largest absolute increase was in the services sector (9,717).

The first column of table 5b lists the national growth rates for each sector, whereas the second column lists the product of the first column and the 1990 level of employment in Anchorage in each sector. The third column is the sum of the second column and the 1990 level of employment in each sector for Anchorage. In other words, the third column—Standardized employment for 1997—is the level of employment in each sector in the municipality of Anchorage that would have resulted if each sector had grown at the same rate as its national counterpart since 1990. The last three columns list the same items using the state growth rates for each sector. Thus, the last column shows the level of employment that would have occurred in each sector in the municipality of Anchorage if each had grown at the same rate as its state counterpart since 1990.

The underlying purpose of shift-share analysis is to provide a way to sort out two key differences between growth in each borough/census area and the Nation (state) at large. The objective is to answer two different but interrelated questions. First, did the difference in employment growth arise because of initial dissimilarities in the industry composition of employment? Or, second, did the difference arise because of disparities in the performance of local industries compared to their national (state) counterparts?

The first six columns of table 5c present the results of a shift-share analysis for the municipality of Anchorage by using national employment in the comparison. Differences between the extent and composition of local employment growth in comparison to that of the Nation are broken down into three hypothetical components: national growth, industry mix, and regional shift.

**Table 5b—Municipality of Anchorage standardized employment, 1997**

| | National | | | State of Alaska | | |
|---|---|---|---|---|---|---|
| | Standardized growth | | Standardized employment | Standardized growth | | Standardized employment |
| Sector[a] | Percent | Net | 1997 level | Percent | Net | 1997 level |
| AFF | 36 | 787 | 2,984 | 6 | 129 | 2,326 |
| Mining | -20 | -1,193 | 4,721 | -10 | -615 | 5,299 |
| Construction | 15 | 1,195 | 9,072 | 23 | 1,806 | 9,683 |
| Manufacturing | -1 | -32 | 2,822 | -3 | -96 | 2,758 |
| TPUC | 15 | 1,887 | 14,398 | 19 | 2,411 | 14,922 |
| Wholesale trade | 8 | 476 | 6,502 | 14 | 837 | 6,863 |
| Retail trade | 15 | 3,676 | 27,561 | 30 | 7,172 | 31,057 |
| FIRE | 10 | 1,260 | 13,709 | -2 | -188 | 12,261 |
| Services | 25 | 10,408 | 52,477 | 28 | 11,832 | 53,901 |
| Government | 3 | 1,026 | 40,780 | -6 | -2,409 | 37,345 |
| Total | 12.5 | 19,490 | 175,026 | 13.4 | 20,878 | 176,414 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

**Table 5c—Municipality of Anchorage components of employment growth, 1990-97**

| | National components | | | | | | State of Alaska components | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | National growth | | Industry mix | | Regional shift | | State growth | | Industry mix | | Regional shift | |
| Sector[a] | Percent | Net | Percent | Net | Percent | Net | Percent | Net | Percent | Net | Percent | Net |
| AFF | 13 | 281 | 23 | 505 | -20 | -435 | 11 | 250 | -6 | -121 | 10 | 223 |
| Mining | 13 | 757 | -33 | -1,950 | -12 | -697 | 11 | 672 | -22 | -1,287 | -22 | -1,275 |
| Construction | 13 | 1,008 | 2 | 186 | 4 | 304 | 11 | 896 | 12 | 910 | -4 | -307 |
| Manufacturing | 13 | 365 | -14 | -397 | 2 | 67 | 11 | 324 | -15 | -421 | 5 | 131 |
| TPUC | 13 | 1,601 | 2 | 286 | 3 | 326 | 11 | 1,423 | 8 | 988 | -2 | -198 |
| Wholesale trade | 13 | 771 | -5 | -295 | 5 | 308 | 11 | 685 | 3 | 152 | -1 | -53 |
| Retail trade | 13 | 3,057 | 3 | 619 | 10 | 2,371 | 11 | 2,716 | 19 | 4,456 | -5 | -1,125 |
| FIRE | 13 | 1,593 | -3 | -333 | -17 | -2,099 | 11 | 1,415 | -13 | -1,604 | -5 | -651 |
| Services | 13 | 5,385 | 12 | 5,023 | -2 | -691 | 11 | 4,783 | 17 | 7,048 | -5 | -2,115 |
| Government | 13 | 5,089 | -10 | -4,062 | -7 | -2,855 | 11 | 4,520 | -17 | -6,929 | 1 | 580 |
| Total | 13 | 19,909 | -.3 | -419 | -2.2 | -3,401 | 11 | 17,684 | 2.1 | 3193 | -3.1 | -4,789 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

Each component attempts to account for a separate aspect of the disparity between the overall growth of employment, locally versus nationally, between 1990 and 1997.

The first component is national growth. It measures the growth in the municipality of Anchorage employment that may be attributed to overall national conditions and trends. If the industry composition and growth of employment had been the same locally as nationally, then Anchorage employment growth from 1990 and 1997 would have matched the overall national rate of 12.8 percent.

The second component, industry mix, is designed to answer the question: Did Anchorage employment growth of 10.3 percent fall behind the overall national rate (12.8 percent) because employment was more concentrated toward slower growing industries when compared to the Nation? That is, was Anchorage employment growth from 1990 to 1997 slower than national growth simply because its industry mix was weighted more heavily toward industries that experienced slower growth at the national level? The results are derived by multiplying local employment in each sector in 1990 by the difference between the national growth rate for each sector and the total national growth rate (12.8 percent). The industry mix results yield positive values for those industries that experienced employment growth above the 12.8-percent national average, and negative values for those industries that grew at rates less than 12.8 percent. The most crucial result from the industry mix calculation is the total derived from summing all industries. The negative values (-0.3 percent and -419) indicate that the industry composition of employment in Anchorage was slightly tilted toward slower growing industries. Positive values would have indicated just the opposite.

The third shift-share component, regional shift, computes the gain (or loss) in local employment from an industry growing faster (or slower) than the same industry nationally. When employment in a local industry grows faster (or declines less) than its national counterpart, there is a positive shift in the net share of national employment captured by that local industry. The total reported for the regional-shift component is -3,401, showing that municipality of Anchorage employment grew 2.2 percent slower than national employment because a larger proportion of employment was in industries that grew slower locally than nationally.

The last six columns of table 5c show results of the same type of shift-share analysis by using Alaska employment in the comparison. Examining the industry mix total, the positive values of 2.1 percent and 3,193 imply that the industry composition of employment in Anchorage was tilted toward the industries that were growing faster at the state level than the overall state growth rate. The negative value of -4,789 for the regional shift component total indicates that Anchorage employment grew 3.1 percent slower than state employment because a larger share of employment was in local industries that performed worse than their state counterparts.

**Kenai Peninsula Borough shift-share analysis**—Tables 6a, 6b, and 6c present Kenai Peninsula Borough employment change between 1990 and 1997, standardized employment in 1997, and national and state shift-share analysis, respectively. These results were calculated by using the same analysis procedures used for Anchorage.

Examining table 6a reveals that total nonfarm employment in the Kenai Peninsula increased by 3,951 jobs or 17.7 percent from 1990 to 1997. This is faster than both the state and national growth rates. Every sector except AFF (-18.2 percent) experienced positive employment growth, with the largest percentage (48.6 percent) and absolute (1,493) increase occurring in the retail trade sector. In table 6c, the positive total value of 204 in the industry mix component of the national shift-share analysis indicates that Kenai Peninsula employment grew by an additional 0.9 percent above the national growth effect because its industry composition of employment was weighted more heavily toward industries that were growing faster nationally than the rate of all industries combined. Similarly, the positive

**Table 6a—Kenai Peninsula Borough employment change, 1990-97**

| | Employment | | | | Actual growth in employment | |
|---|---|---|---|---|---|---|
| | 1990 | | 1997 | | | |
| Sector[a] | Level | Share | Level | Share | Percent | Net |
| AFF | 2,494 | 11.2 | 2,040 | 7.8 | -18.2 | -454 |
| Mining | 1,189 | 5.3 | 1,275 | 4.9 | 7.2 | 86 |
| Construction | 1,318 | 5.9 | 1,637 | 6.2 | 24.2 | 319 |
| Manufacturing | 2,182 | 9.8 | 2,368 | 9.0 | 8.5 | 186 |
| TPUC | 1,340 | 6.0 | 1,550 | 5.9 | 15.7 | 210 |
| Wholesale trade | 480 | 2.2 | 571 | 2.2 | 19.0 | 91 |
| Retail trade | 3,069 | 13.8 | 4,562 | 17.4 | 48.6 | 1,493 |
| FIRE | 1,053 | 4.7 | 1,105 | 4.2 | 4.9 | 52 |
| Services | 5,293 | 23.8 | 6,539 | 24.9 | 23.5 | 1,246 |
| Government | 3,867 | 17.4 | 4,589 | 17.5 | 18.7 | 722 |
| Total | 22,285 | | 26,236 | | 17.7 | 3,951 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

**Table 6b—Kenai Peninsula Borough standardized employment, 1997**

| | National | | | State of Alaska | | |
|---|---|---|---|---|---|---|
| | Standardized growth | | Standardized employment | Standardized growth | | Standardized employment |
| Sector[a] | Percent | Net | 1997 level | Percent | Net | 1997 level |
| AFF | 36 | 893 | 3,387 | 6 | 146 | 2,640 |
| Mining | -20 | -240 | 949 | -10 | -124 | 1,065 |
| Construction | 15 | 200 | 1,518 | 23 | 302 | 1,620 |
| Manufacturing | -1 | -24 | 2,158 | -3 | -74 | 2,108 |
| TPUC | 15 | 202 | 1,542 | 19 | 258 | 1,598 |
| Wholesale trade | 8 | 38 | 518 | 14 | 67 | 547 |
| Retail trade | 15 | 472 | 3,541 | 30 | 921 | 3,990 |
| FIRE | 10 | 107 | 1,160 | -2 | -16 | 1,037 |
| Services | 25 | 1,309 | 6,602 | 28 | 1,489 | 6,782 |
| Government | 3 | 100 | 3,967 | -6 | -234 | 3,633 |
| Total | 13.7 | 3,057 | 25,342 | 12.3 | 2,736 | 25,021 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

**Table 6c—Kenai Peninsula Borough components of employment growth, 1990-97**

| | National components | | | | | | State of Alaska components | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | National growth | | Industry mix | | Regional shift | | State growth | | Industry mix | | Regional shift | |
| Sector[a] | Percent | Net | Percent | Net | Percent | Net | Percent | Net | Percent | Net | Percent | Net |
| AFF | 13 | 319 | 23 | 574 | -54 | -1,347 | 11 | 284 | -6 | -137 | -24 | -600 |
| Mining | 13 | 152 | -33 | -392 | 27 | 326 | 11 | 135 | -22 | -259 | 18 | 210 |
| Construction | 13 | 169 | 2 | 31 | 9 | 119 | 11 | 150 | 12 | 152 | 1 | 17 |
| Manufacturing | 13 | 279 | -14 | -304 | 10 | 210 | 11 | 248 | -15 | -322 | 12 | 260 |
| TPUC | 13 | 172 | 2 | 31 | 1 | 8 | 11 | 152 | 8 | 106 | -4 | -48 |
| Wholesale trade | 13 | 61 | -5 | -23 | 11 | 53 | 11 | 55 | 3 | 12 | 5 | 24 |
| Retail trade | 13 | 393 | 3 | 79 | 33 | 1,021 | 11 | 349 | 19 | 573 | 19 | 572 |
| FIRE | 13 | 135 | -3 | -28 | -5 | -55 | 11 | 120 | -13 | -136 | 6 | 68 |
| Services | 13 | 678 | 12 | 632 | -1 | -63 | 11 | 602 | 17 | 887 | -5 | -243 |
| Government | 13 | 495 | -10 | -395 | 16 | 622 | 11 | 440 | -17 | -674 | 25 | 956 |
| Total | 13 | 2,852 | .9 | 204 | 4 | 894 | 11 | 2,534 | .9 | 202 | 5.5 | 1,215 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

national comparison, with the industry mix component adding 202 jobs (0.9 percent) beyond the state growth effect, and the regional shift component adding another 1,215 jobs (5.5 percent).

**Valdez-Cordova Census Area shift-share analysis—**Employment change between 1990 and 1997, standardized employment in 1997, and shift-share analysis (national and state) for the Valdez-Cordova Census Area are presented in tables 7a, 7b, and 7c, respectively. Because employment levels for the mining and wholesale trade sectors were not available because of disclosure rules, employment changes in these sectors could not be calculated

Table 7a shows that the overall growth rate in nonfarm employment for Valdez-Cordova was 6 percent, which was slower than both the national and state growth rates. The sector with the largest percentage decrease in employment was the FIRE sector (-32.2 percent), whereas the government sector had the largest absolute decrease (-181 jobs). The services sector had the largest percentage (43 percent) and absolute increase (506 jobs) in employment.

The national shift-share analysis for the Valdez-Cordova area shows that the industry mix component added 67 additional jobs. This indicates that local employment increased by an additional 1 percent (beyond the national growth effect) because the industrial composition of local employment was slightly tilted toward sectors that were growing faster at the national level than the overall national growth rate. On the other hand, the regional-shift component resulted in a decrease of 522 jobs, thereby suggesting that employment in the Valdez-Cordova area grew 7.8 percent slower because a large proportion of local industries performed worse than their national counterparts. The state shift-share analysis reveals that the Valdez-Cordova employment growth between 1990 and 1997 of 6 percent fell short of the 11.4 percent growth in employment statewide by 5.4 percent. A small amount of this difference (0.5 percent) was because the local industry mix of employment was inclined toward sectors that experienced slower growth at the state level, whereas most of the deficit (4.9 percent) was due to local industries performing worse than their state counterparts.

**Table 7a—Valdez-Cordova Census Area employment change, 1990-97**

| | Employment | | | | Actual growth in employment | |
|---|---|---|---|---|---|---|
| | 1990 | | 1997 | | | |
| Sector[a] | Level | Share | Level | Share | Percent | Net |
| AFF | 745 | 11.2 | 642 | 9 | -14 | -103 |
| Mining | 15 | .2 | | | | |
| Construction | 286 | 4.3 | 308 | 4 | 8 | 22 |
| Manufacturing | 817 | 12.2 | 715 | 10 | -12 | -102 |
| TPUC | 969 | 14.5 | 1,094 | 16 | 13 | 125 |
| Wholesale trade | 92 | 1.4 | | | | |
| Retail trade | 720 | 10.8 | 855 | 12 | 19 | 135 |
| FIRE | 230 | 3.4 | 156 | 2 | -32 | -74 |
| Services | 1,189 | 17.8 | 1,695 | 24 | 43 | 506 |
| Government | 1,614 | 24.2 | 1,433 | 20 | -11 | -181 |
| Total | 6,677 | | 7,076 | | 6 | 399 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

**Table 7b—Valdez-Cordova Census Area standardized employment, 1997**

| | National | | | State of Alaska | | |
|---|---|---|---|---|---|---|
| | Standardized growth | | Standardized employment | Standardized growth | | Standardized employment |
| Sector[a] | Percent | Net | 1997 level | Percent | Net | 1997 level |
| AFF | 36 | 267 | 1,012 | 6 | 44 | 789 |
| Mining | 0 | -3 | 12 | -10 | -2 | 13 |
| Construction | 15 | 43 | 329 | 23 | 66 | 352 |
| Manufacturing | -1 | -9 | 808 | -3 | -28 | 789 |
| TPUC | 15 | 146 | 1,115 | 19 | 187 | 1,156 |
| Wholesale trade | 8 | 7 | 99 | 14 | 13 | 105 |
| Retail trade | 15 | 111 | 831 | 30 | 216 | 936 |
| FIRE | 10 | 23 | 253 | -2 | -3 | 227 |
| Services | 25 | 294 | 1,483 | 28 | 334 | 1,523 |
| Government | 3 | 42 | 1,656 | -6 | -98 | 1,516 |
| Total | 13.8 | 921 | 7,598 | 10.9 | 729 | 7,406 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

**Table 7c—Valdez-Cordova Census Area components of employment growth, 1990-97**

| | National components | | | | | | State of Alaska components | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | National growth | | Industry mix | | Regional shift | | State growth | | Industry mix | | Regional shift | |
| Sector[a] | Percent | Net | Percent | Net | Percent | Net | Percent | Net | Percent | Net | Percent | Net |
| AFF | 13 | 95 | 23 | 171 | -50 | -370 | 11 | 85 | -6 | -41 | -20 | -147 |
| Mining | 13 | 2 | 3 | -5 | | | 11 | 2 | -22 | -3 | | |
| Construction | 13 | 37 | 2 | 7 | -7 | -21 | 11 | 33 | 12 | 33 | -15 | -44 |
| Manufacturing | 13 | 105 | -14 | -114 | -11 | -93 | 11 | 93 | -15 | -120 | -9 | -74 |
| TPUC | 13 | 124 | 2 | 22 | -2 | -21 | 11 | 110 | 8 | 77 | -6 | -62 |
| Wholesale trade | 13 | 12 | -5 | -5 | | | 11 | 10 | 3 | 2 | | |
| Retail trade | 13 | 92 | 3 | 19 | 3 | 24 | 11 | 82 | 19 | 134 | -11 | -81 |
| FIRE | 13 | 29 | -3 | -6 | -42 | -97 | 11 | 26 | -13 | -30 | -31 | -71 |
| Services | 13 | 152 | 12 | 142 | 18 | 212 | 11 | 135 | 17 | 199 | 14 | 172 |
| Government | 13 | 207 | -10 | -165 | -14 | -223 | 11 | 184 | -17 | -281 | -5 | -83 |
| Total | 13 | 855 | 1 | 67 | -7.8 | -522 | 11 | 759 | -.5 | -30 | -4.9 | -330 |

[a] See table 2, footnote a.
Source: Chugach planning team with data from U.S. Bureau of Economic Analysis 1999.

**Summary**—In all three areas, the regional shift component outweighed the industry mix component in both the national and state shift-share analysis for the 1990-97 period. In other words, differences between local (borough/census area) and national or state employment growth rates were primarily due to local sectors growing faster or slower than their national or state counterparts rather than the local employment growth being concentrated in sectors that were growing fastest or slowest at the national or state levels.

## Employment Versus Earnings

Because average wages and salaries differ by industry, a change in sector employment does not necessarily translate to a proportional change in earnings in that sector. In some instances, an increase in employment in a sector over a given period is associated with a decrease in total earnings in that sector over the same period, and vice versa. Figures 3 through 5 present the change in employment and income for each sector and overall, between 1990 and 1997, for the three borough/census areas.

Figure 3 shows that overall employment in Anchorage increased by 16,089 jobs (10.3 percent) and overall earnings increased by about $216 million (3.7 percent). The services and retail trade sectors had the largest increases in employment, whereas the services and TPUC sectors had the largest increases in earnings. Employment in the mining sector decreased by 1,890 jobs, and earnings in the mining sector decreased by about $160 million. Average earnings in the mining sector were actually higher in 1997 than they were in 1990.

Figure 4 shows that overall employment in the Kenai Peninsula Borough increased by 3,916 jobs (17.7 percent), but overall earnings decreased by about $23 million (-3 percent). The largest increases in employment were in the services and retail trade sectors, whereas the largest increases in earnings were in the government and retail trade sectors. Although employment in the AFF sector decreased by only 450 jobs, earnings in this sector decreased by over $53 million. Average earnings in this sector declined from about $32,000 in 1990 to about $13,000 in 1997.

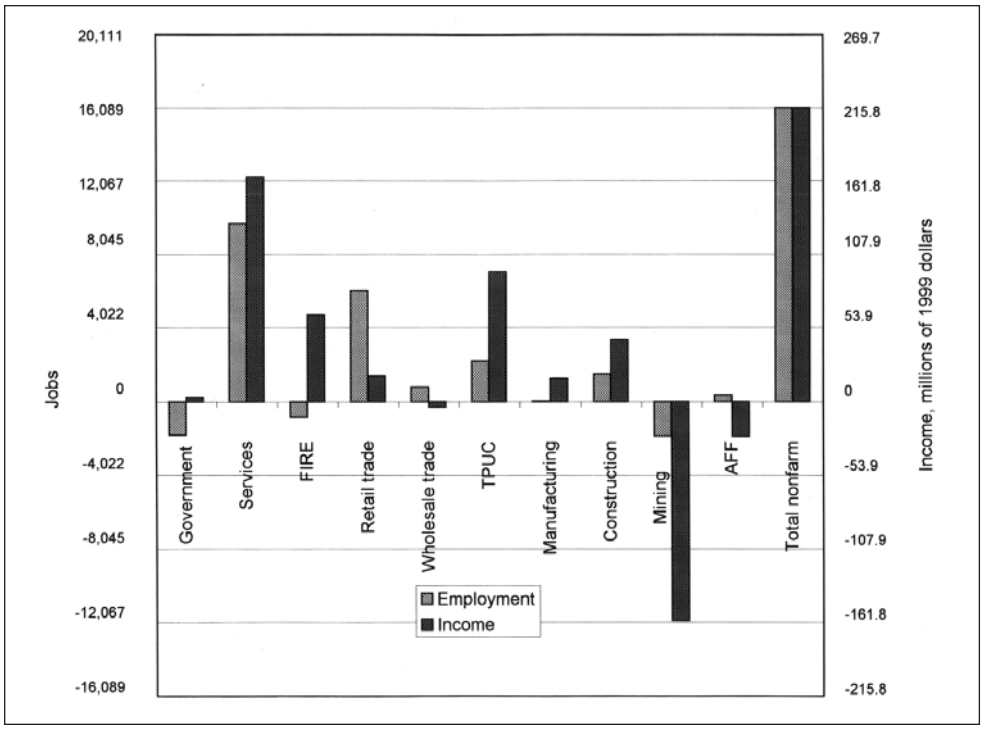


Figure 3—Change in employment and income (in thousands of 1999 dollars) by sector in municipality of Anchorage between 1990 and 1997 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999 and Economic Report of the President 2000).

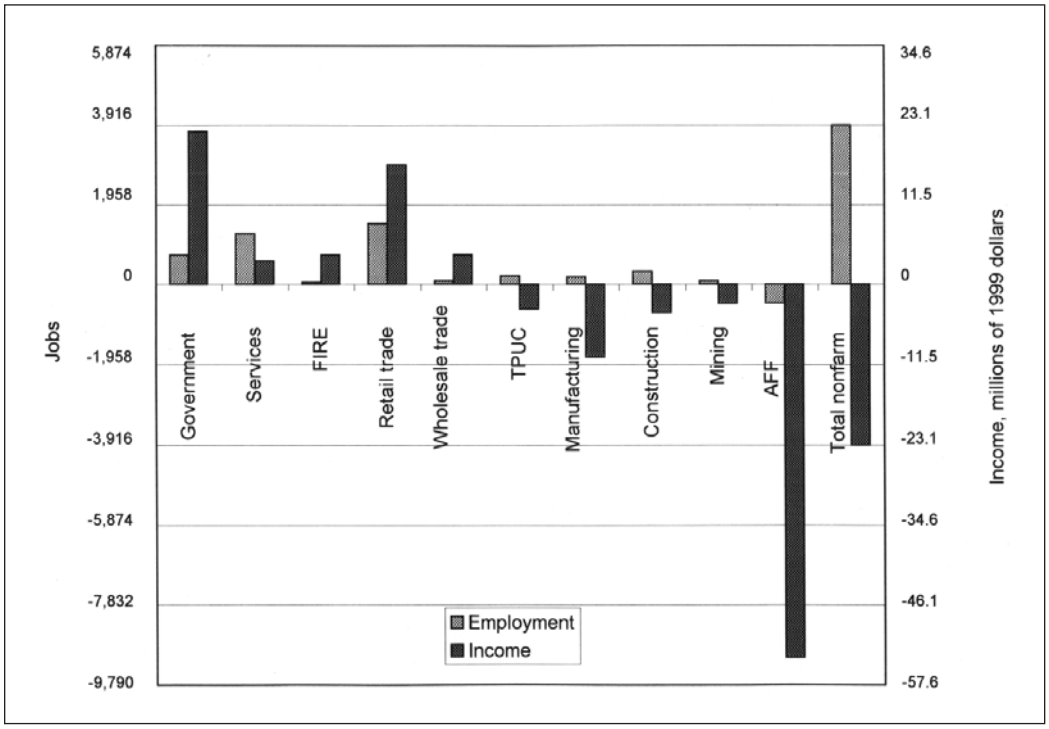


Figure 4—Change in employment and income (in thousands of 1999 dollars) by sector in Kenai Peninsula Borough between 1990 and 1997 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999 and Economic Report of the President 2000).

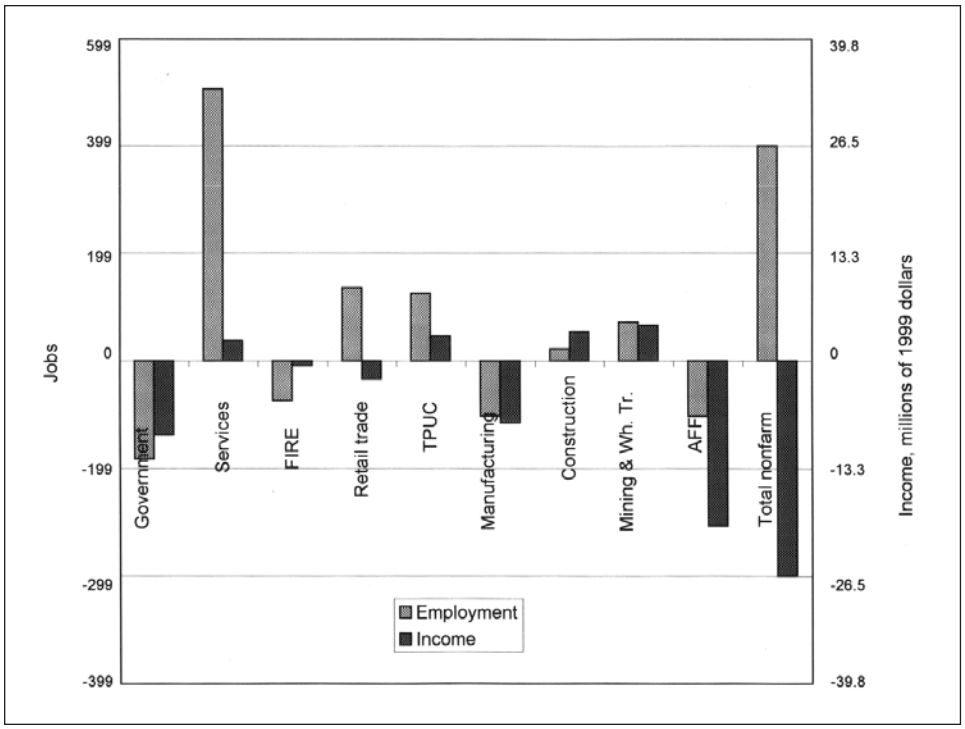


Figure 5—Change in employment and income (in thousands of 1999 dollars) by sector in Valdez-Cordova Census Area between 1990 and 1997 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999 and Economic Report of the President 2000).

In the Valdez-Cordova Census Area, overall employment increased by 399 jobs (6 percent), whereas total earnings decreased by about $26.5 million (-10 percent) (fig. 5). The services sector drove the overall increase in employment, whereas the AFF sector was the major cause of the overall decrease in earnings. Average earnings in this sector in the Valdez-Cordova area fell from $45,500 in 1990 to about $21,250 in 1997.

Figures 6a though 8b further illustrate important differences in employment and earnings by sector in the south-central Alaska areas. Figures 6a and 6b show the relative size of the sectors in Anchorage in terms of employment and income, respectively, for 1997. The retail trade and service sectors accounted for 48 percent of total employment in Anchorage but only 35 percent of total earnings. On the other hand, the government and mining sectors accounted for just 24 percent of total employment but 33 percent of total earnings.

Figures 7a and 7b show that a similar relation existed in 1997 in the Kenai Peninsula Borough. Here, the services and retail trade sectors comprised 43 percent of total employment, but only 28 percent of total earnings. The government and mining sectors accounted for just 22 percent of total employment but 34 percent of total earnings.

The employment and earnings breakdown for the Valdez-Cordova Census Area are shown in figures 8a and 8b, respectively. Again, the services and retail sectors make up a larger percentage of employment (37 percent) than earnings (19 percent). The TPUC sector accounted for only 15 percent of total employment but 33 percent of total earnings.

## Economic Diversity

Economic diversity is a measure of the distribution of employment across industries in an area. An area with high economic diversity has employment in many different types of industries. Economic diversity is an important element in

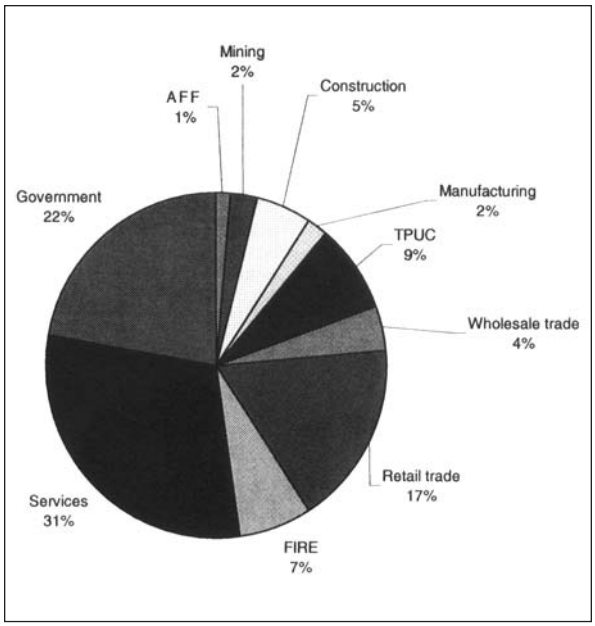


Figure 6a—Municipality of Anchorage employment in 1997 by sector (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999).

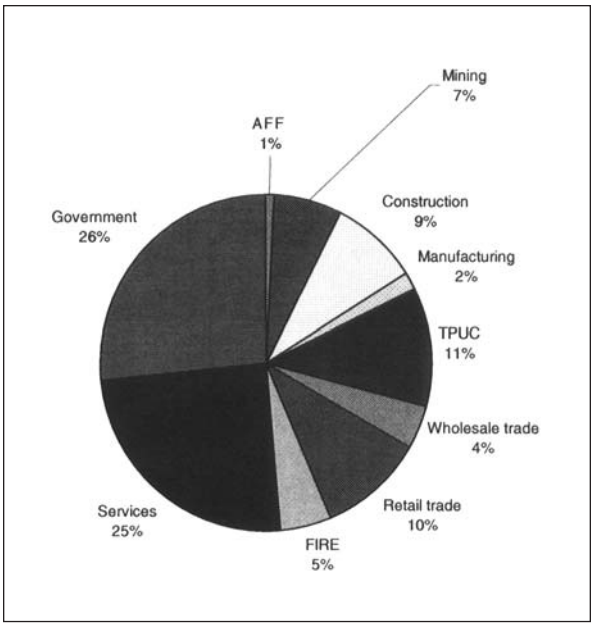


Figure 6b—Municipality of Anchorage income in 1997 by sector (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999 and Economic Report of the President 2000).

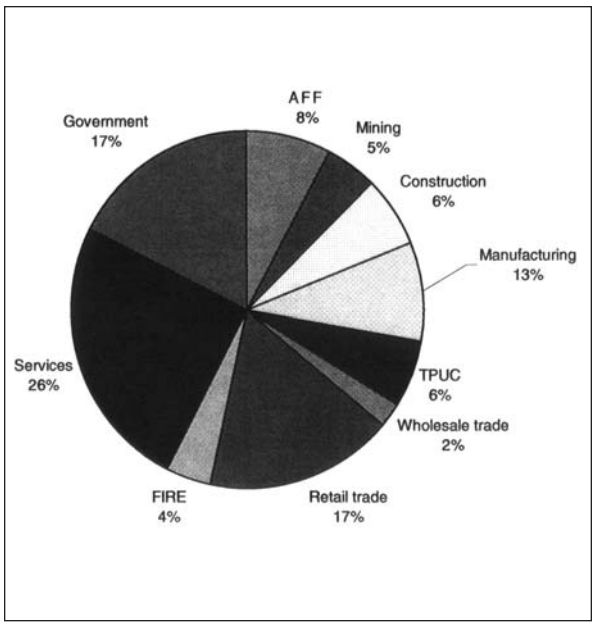


Figure 7a—Kenai Peninsula Borough employment in 1997 by sector (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999).

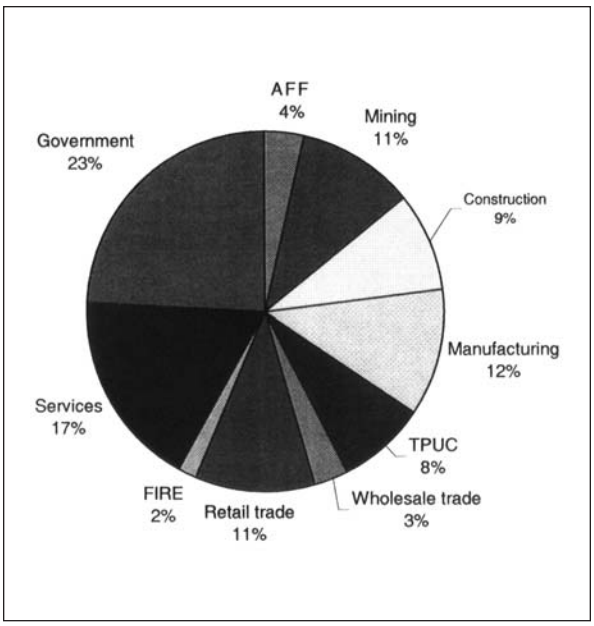


Figure 7b—Kenai Peninsula Borough income in 1997 by sector (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999 and Economic Report of the President 2000).

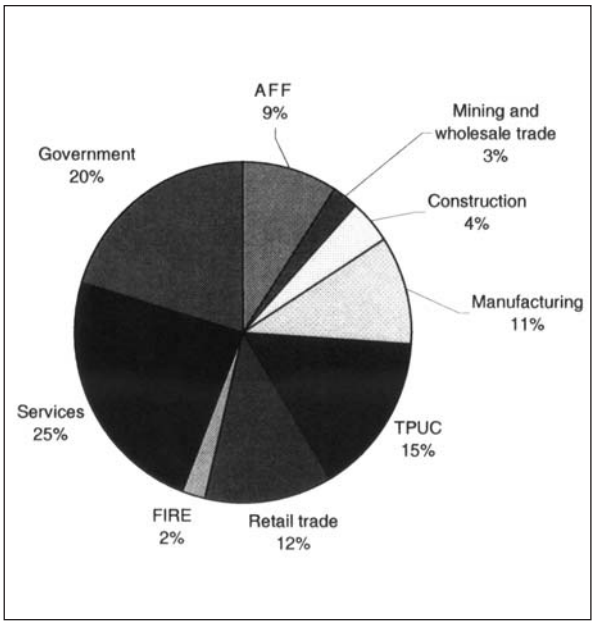


Figure 8a—Valdez-Cordova Census Area employment in 1997 by sector (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999).

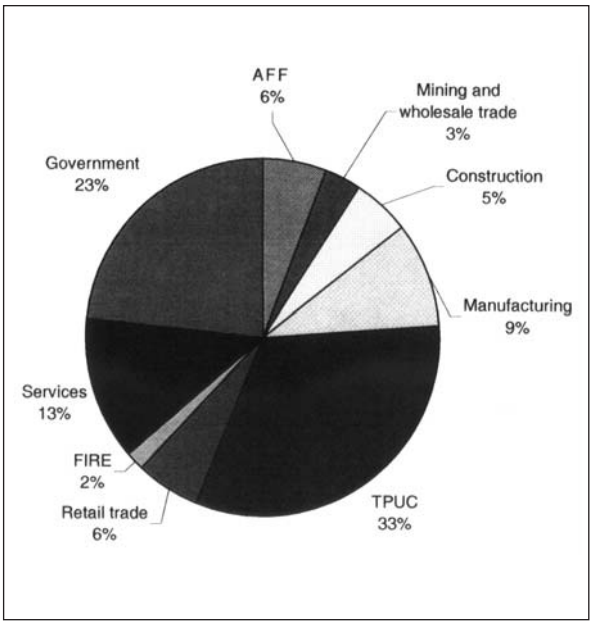


Figure 8b—Valdez-Cordova Census Area income in 1997 by sector (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999 and Economic Report of the President 2000).

the economic resiliency of an area, which can be defined as the ability to adapt to changes in economic activity caused by market or other outside forces. An area with a majority of employment in a single industry is vulnerable to declines within that industry. In contrast, an area with employment in many industries is less likely to be severely impacted by a decline in a single industry.

The Shannon-Weaver diversity index is a statistical method used to measure economic diversity in an area (Shannon and Weaver 1949). Comparisons among different areas are possible with this statistic. An area with all employment in a single industry will have an index of zero. An area with perfect diversity, an equal amount of employment in each and every industry category, will have an index of one. Table 8 displays the results of the Shannon-Weaver diversity analysis for the United States, Alaska, and south-central Alaska. The data used is from the IMPLAN (Impact Analysis for Planning) input-output model (Minnesota IMPLAN Group, Inc. 1999). All part- and full-time employees are counted in the employment total for each industry category.

The results show that the three borough/census areas have experienced increasing diversity over the period, as have the Nation and state. Economic diversity is often correlated to population density and transportation systems, especially highways. There is evidence of this in south-central Alaska where the Valdez-Cordova Census Area, which has the smallest population and lacks a connecting road system, has the lowest diversity score.

## Resident and Nonresident Employment

Alaska has a long history of nonresident employment. In 1997, 20.3 percent of all wage and salary employees in the state were considered nonresidents. The state average earnings per employee was $22,352 in 1997, with the average for residents at $24,845 and for nonresidents $12,560. The highest concentrations of nonresidents work in seasonal, lower paying positions.

**Table 8—Shannon-Weaver economic diversity index for the United States, Alaska, and south-central Alaska[a]**

| Year | United States | Alaska | Municipality of Anchorage | Kenai Peninsula Borough | Valdez-Cordova Census Area |
|---|---|---|---|---|---|
| 1977 | 0.66 | 0.35 | 0.34 | NA | NA |
| 1982 | .69 | .56 | .57 | 0.48 | .46 |
| 1985 | .72 | .58 | .58 | .58 | .49 |
| 1990 | .75 | .65 | .64 | .62 | .56 |
| 1991 | .74 | .65 | .65 | .60 | .55 |
| 1992 | .74 | .64 | .63 | .61 | .57 |
| 1993 | .74 | .65 | .63 | .63 | .57 |

NA = data not available.
[a] These indices are normalized with respect to the maximum possible index for the 528 industries (standard industry classification codes). The Shannon-Weaver entropy function (Shannon and Weaver 1949) was used to calculate indices of economic diversity (Attaran 1986).
Source: USDA Forest Service, Inventory and Monitoring Institute, 2150 Centre St., Fort Collins, CO 80526.

**Table 9—Nonresident employment and earnings for Alaska and south-central Alaska, 1993-97**

| | Nonresident employment | | | | | Nonresident earnings | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Community | 1993 | 1994 | 1995 | 1996 | 1997 | 1993 | 1994 | 1995 | 1996 | 1997 |
| | *- - - Percentage of total employment - - -* | | | | | *- - - Percentage of total employment - - -* | | | | |
| Alaska | 22.8 | 26.3 | 26.4 | 21.5 | 20.3 | 11.8 | 15.6 | 15.6 | 11.9 | 11.4 |
| Anchorage | 18.3 | 18.8 | 18.5 | NA | 16.5 | 9.7 | 10.7 | 10.4 | NA | 9.8 |
| Kenai Peninsula | 32.0 | 29.9 | 31.8 | NA | 26.4 | 17.1 | 13.7 | 14.9 | NA | 12.2 |
| Valdez-Cordova | 45.4 | 40.1 | 39.3 | NA | 38.7 | 27.9 | 28.0 | 22.1 | NA | 25.3 |

NA = not available.
Source: Hadland 1999.

Statewide, the seafood processing industry has the highest proportion of nonresidents. In 1997, nonresidents accounted for 76 percent of the industry's employees and took home 69 percent of industry wages. Sectors related to tourism activities also have significant nonresident employment levels. Thirty-one percent of employment in the hotel industry was made up of nonresidents, and they received 21 percent of the wages in 1997. In the same year, the restaurant sector employed 30 percent nonresidents, and they received 18 percent of total wages.

Table 9 shows total nonresident employment and earnings for the state and for the three borough/census areas from 1993 to 1997. Residency information is not available by sector for the borough/census areas. Over the period, nonresident employment and earnings as a percentage of total employment and earnings have declined. The Valdez-Cordova Census Area has the highest percentage of nonresident employees, which is probably due to the large amount of seafood processing activity in this area. The Kenai Peninsula has a higher percentage of nonresident employment than the state average, whereas Anchorage has a lower percentage than the state average.

## Personal Income

Total personal income comprises nonfarm income, farm income, property income, and transfer payments. The largest component is nonfarm income, which includes all wages and

**Table 10—Components of total personal income for the United States, Alaska, and south-central Alaska, 1997**

| Income component | United States | Alaska | South-central Alaska | Municipality of Anchorage | Kenai Peninsula | Valdez-Cordova |
|---|---|---|---|---|---|---|
| | | | *Percent* | | | |
| Nonfarm income | 65.7 | 67.9 | 69.5 | 70.2 | 65.0 | 67.6 |
| Farm income | .7 | .1 | .0 | .0 | .01 | .0 |
| Property income | 17.2 | 12.8 | 13.2 | 13.1 | 13.3 | 13.7 |
| Transfer payments: | 16.4 | 19.3 | 17.3 | 16.6 | 21.8 | 18.7 |
| Retirement and disability | 7.8 | 6.9 | 6.7 | 6.6 | 7.3 | 7.4 |
| Medical payments | 5.6 | 3.7 | 3.1 | 3.0 | 4.0 | 2.2 |
| Income maintenance | 1.4 | 1.6 | 1.2 | 1.2 | 1.3 | 1.0 |
| Unemployment insurance | .3 | .7 | .6 | .3 | 1.8 | 2.1 |
| Other benefit payments | 1.2 | 6.5 | 5.7 | 5.5 | 7.3 | 6.0 |

Source: U.S. Bureau of Economic Analysis 1999.

salaries that are not directly associated with farming activity. Farm income includes proprietor's net farm income, wages and payments-in-kind for farm labor, and salaries of officers of corporate farms. In 1997, nonfarm income was 65.7 percent and farm income was about 1 percent of U.S. total personal income. Property income includes all rents, dividends, and earnings not associated with employment. The 1997 property income portion of U.S. total personal income was 17.2 percent. Transfer payments include retirement and disability payments (social security; workers compensation; federal, state, and local government retirement); medical payments (Medicare); income maintenance (aid to families with dependent children, food stamps, and supplemental security income); unemployment insurance; and other benefits (veterans benefits, federal education and training, Bureau of Indian affairs, and Alaska permanent dividends). Transfer payments accounted for about 16.4 percent of the 1997 U.S. total personal income. Table 10 summarizes total personal income in 1997 for the United States, Alaska, and the study area.

Alaska has a higher percentage of total personal income in nonfarm income and a lower percentage in property income compared to the United States as a whole. Transfer payments are similar in total, but of the five subcategories, Alaska receives a greater proportion in the "other benefits" category. This includes payment of the permanent fund dividend, which is received by all residents of Alaska.

The composition of total personal income for 1979 to 1997 for the United States, Alaska, and the three borough/census areas are shown in figures 9a through 9e. The three categories shown are earnings (includes farm and nonfarm income), property income, and transfer payments. In all five areas, earnings have decreased, whereas property income and transfer payments have increased in percentage terms over the period. Much of the shift in the share of income from earnings to transfer payments is probably due to the aging of the population.

Figure 10 displays the 1979-97 trends in total personal income as an index, adjusted for inflation, for examining all areas in terms of growth over time rather than with respect to the absolute magnitude of total figures. Again, 1979 is used as the index year.

Personal income in Alaska fluctuated more than the fairly steady growth in U.S. personal income. A peak occurred in the mid-1980s when the state government spent oil revenues on infrastructure throughout Alaska. When oil prices dropped in the late 1980s, state personal income fell as well. Recovering in the early 1990s, Alaska's

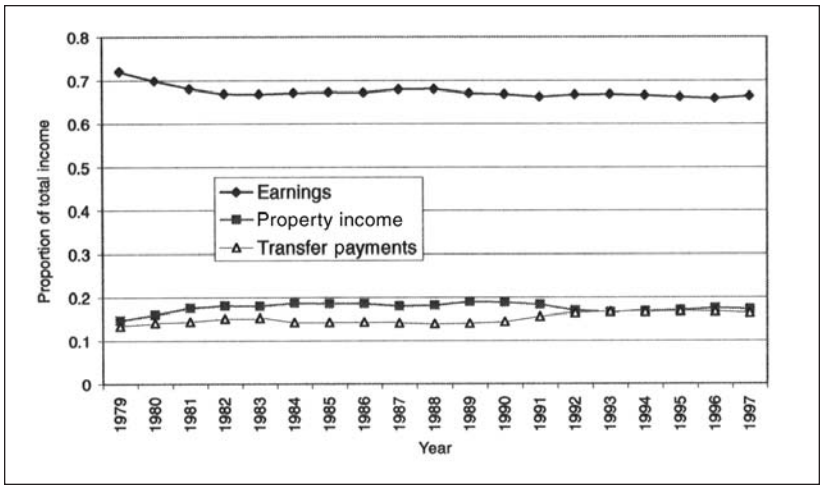


Figure 9a—Composition of total personal income in the United States, 1979-97 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

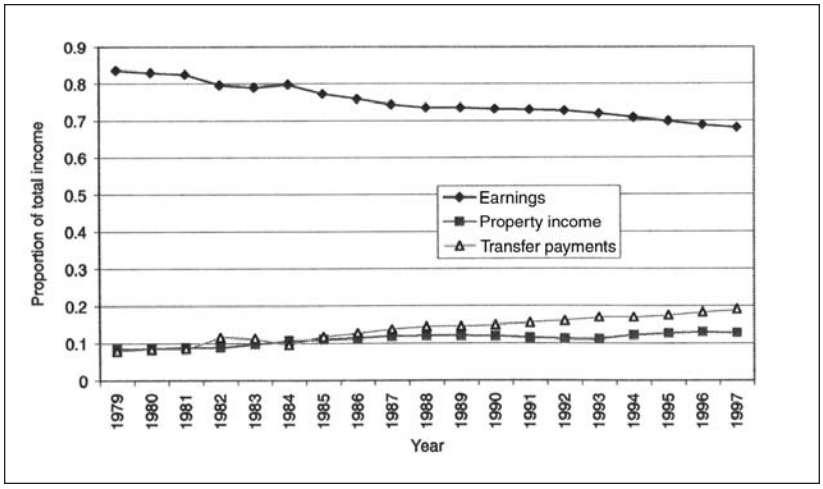


Figure 9b—Composition of total personal income in Alaska, 1979-97 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

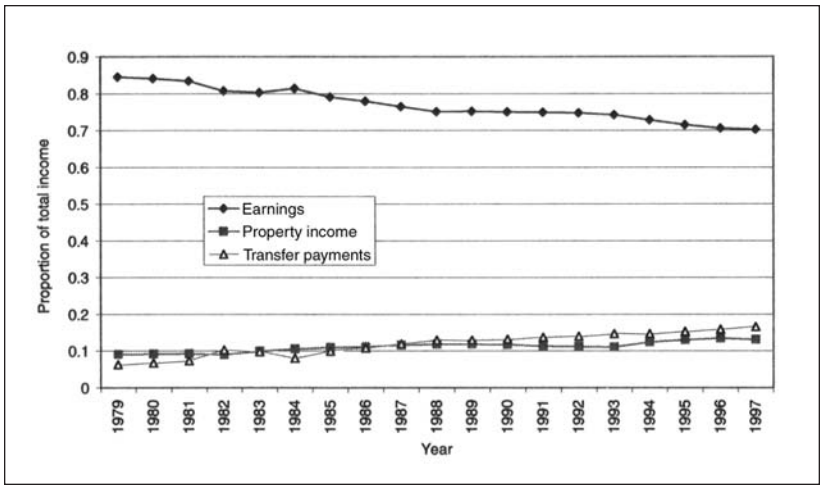


Figure 9c—Composition of total personal income in municipality of Anchorage, 1979-97 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

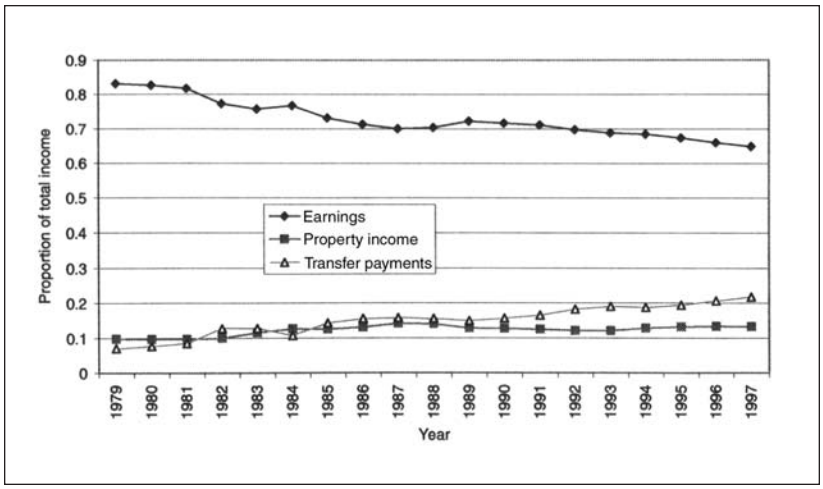


Figure 9d—Composition of total personal income in Kenai Peninsula Borough, 1979-97 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

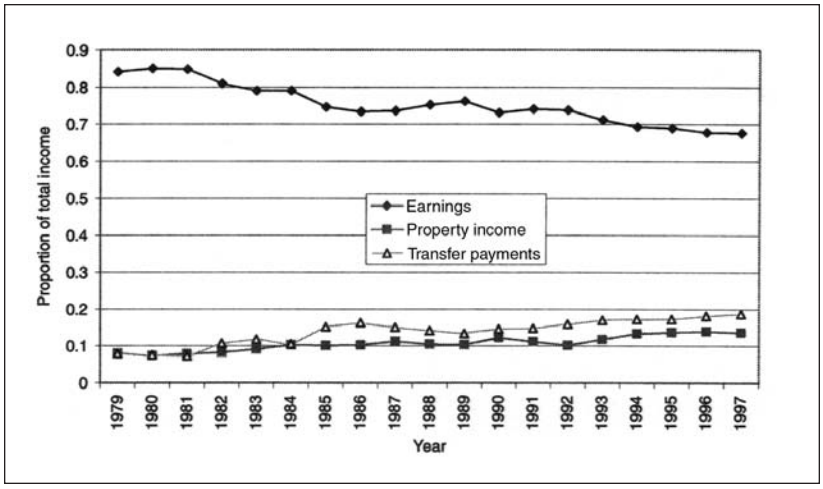


Figure 9e—Composition of total personal income in Valdez-Cordova Census Area, 1979-97 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

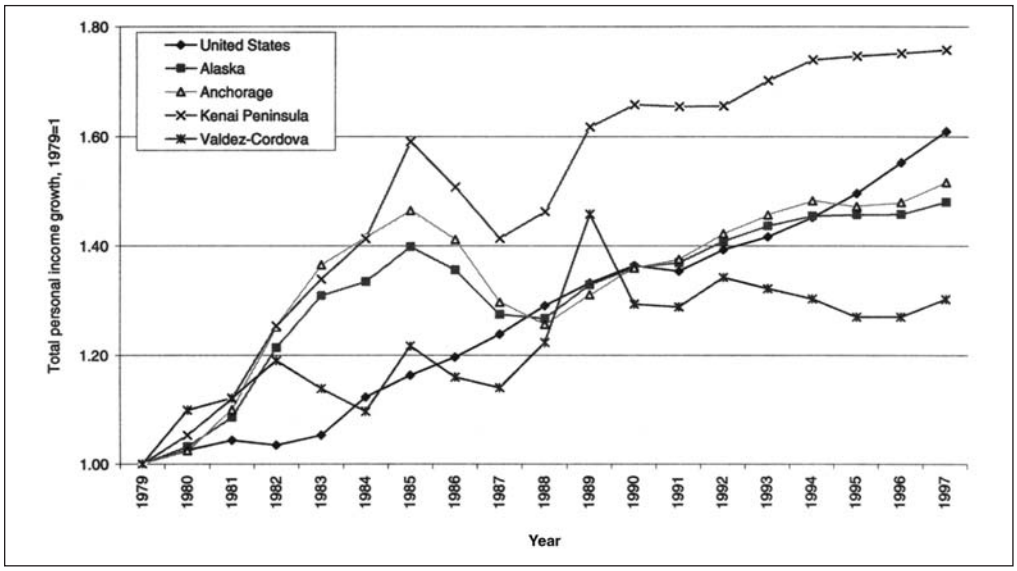


Figure 10—Total personal income (1999 dollars) in the United States, Alaska, and south-central Alaska, 1979-97, indexed to 1979. (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

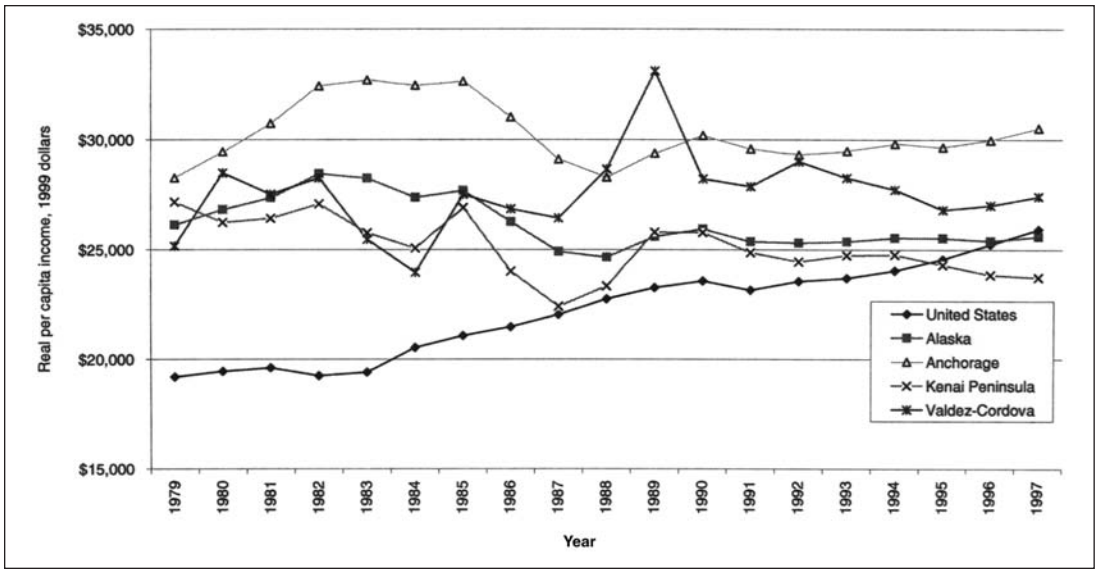


Figure 11—Per capita personal income (1999 dollars) in the United States, Alaska, and south-central Alaska, 1979-97 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

total personal income has seen fairly stable growth into the present. Personal incomes in the Anchorage and Kenai Peninsula Borough areas have roughly followed the same trends as the state, although personal income has grown proportionately faster in the Kenai Peninsula Borough.

The Valdez-Cordova Census Area is not in line with the other areas or with state trends. The area shows more volatility in personal income through the early 1990s with a 1989 spike associated with cleanup efforts related to the *Exxon-Valdez* oil spill. Personal income increased after the spill but has declined again in recent years. This area is linked to the harvesting and manufacturing of wood products, fishing, and mining. Income trends in the area may more closely follow trends in these industries rather than state income trends.

Per capita personal income is a measure that includes trends in population and total personal income. This measure is often used as an indicator of socioeconomic well-being in an area. In the past, people from the lower 48 states have been enticed to come and work in Alaska by the promise of higher wages and a higher standard of living. Over the years, the difference between average incomes in the United States and income in Alaska has decreased, although some areas maintain a larger gap. Figure 11 displays the trends in per capita income for the United States, Alaska, and south-central Alaska from 1979 to 1997. These values are adjusted for inflation, so the values of each year are comparable in 1999 dollars. It is easy to see the closing gap between Alaska per capita income and U.S. per capita income. The United States displays an increasing trend, whereas Alaska fluctuates more with overall economic trends. More recently, the per capita incomes at the state level and in Anchorage have remained fairly stable, whereas Valdez-Cordova and the Kenai Peninsula areas have had slightly declining per capita income levels.

Table 11 displays 1997 per capita income statistics for the United States, Alaska, and south-central Alaska. The per capita income in the Kenai Peninsula was only 82 percent of the U.S. average, whereas the per capita income in the municipality of Anchorage was 18 percent higher than the U.S average. Without cost of living estimates, it is difficult to determine whether Alaskans are relatively better off than the average U.S. citizen.

**Table 11—1997 per capita income statistics for the United States, Alaska, and south-central Alaska**

| Variable | United States | Alaska | Municipality of Anchorage | Kenai Peninsula | Valdez-Cordova |
|---|---|---|---|---|---|
| Per capita personal income | $25,288 | $24,969 | $29,765 | $23,143 | $26,743 |
| Percentage of U.S. per capita income | 100 | 99 | 118 | 82 | 106 |
| Percentage of Alaska per capita income | -- | 100 | 119 | 93 | 107 |
| Annual average growth in per capita income, 1987-97 | 4.7 | 3.3 | 3.5 | 3.6 | 3.4 |
| Annual average growth in per capita income, 1996-97 | 4.7 | 2.7 | 3.7 | 1.4 | 3.4 |

Source: U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000.

## Regional Summary

Figures 12a through 12e present a summary look at population, employment, total personal income, and per capita personal income in the United States, Alaska, and south-central Alaska from 1979 to 1997. Again, 1979 is used as the index year, and the income values have been converted to 1999 dollars. Figure 12a shows that in the United States, since 1984, employment has been increasing at the fastest rate, followed by total personal and per capita incomes, which have been increasing at about the same rate. Population has been increasing at the slowest rate and has grown at about the same rate throughout the period.

Figure 12b shows that in Alaska, employment, total personal income, and population increased fairly rapidly until the recession of the mid to late 1980s when these indicators decreased or leveled off. All three indicators, however, following this recessionary period, have increased. Per capita income in Alaska began to decrease in 1983, reaching a low in 1988 before increasing slightly and then remaining fairly constant through 1997.

As shown in figure 12c, Anchorage has followed the same general trends as the state with respect to the first three indicators, although employment and total personal income have increased relatively more than population. The dips in per capita income were more pronounced in Anchorage relative to the state as a whole.

Figure 12d shows that in the Kenai Peninsula Borough, the first three indicators were increasing at roughly the same rate until the recession of the mid to late 1980s. Since 1989, population and total personal income have grown at roughly the same rate whereas employment is growing at a slower rate. This may be indicative of a growing number of retirees in the area. Per capita income has followed a slightly decreasing trend in the 1990s.

Figure 12e reveals that the Valdez-Cordova Census Area exhibited the most volatility in the indicators up until 1990. Total personal income, employment, and per capita personal income all spiked with the 1989 *Exxon Valdez* oil spill clean-up efforts. Since 1990, total personal income and employment have experienced slight decreases and increases but have remained above their pre-spill levels. Per capita income also has vacillated in the 1990s but, except for 1992, has remained below its pre-spill level. Since 1988, population has increased at a fairly slow rate. The higher variability in the employment and personal income indicators for the Valdez-Cordova Census Area, relative to the other areas, is perhaps a result of the lower economic diversity and larger relative significance of resource-dependent sectors in its economic structure.

The dissimilarities between the three south-central Alaska areas, as shown in these summary figures and the accompanying discussion, indicate that the three areas are likely to be impacted

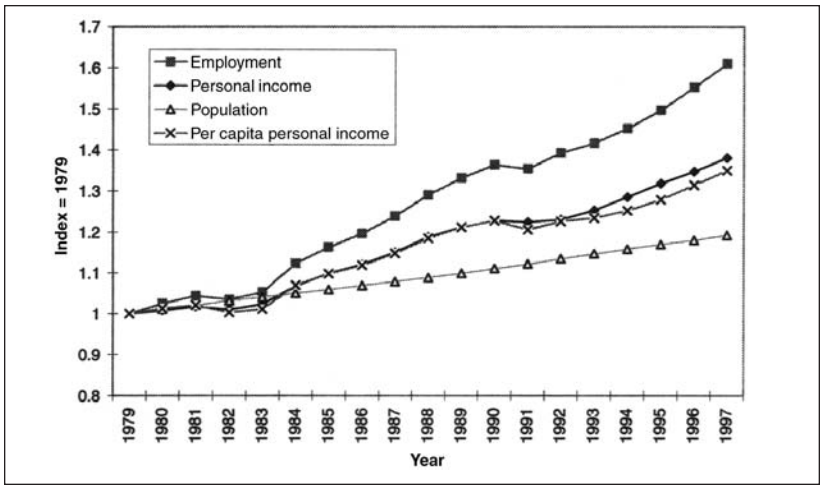


Figure 12a—Population, employment, and total and per capita personal income (1999 dollars) for the United States, 1979-97, indexed to 1979 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

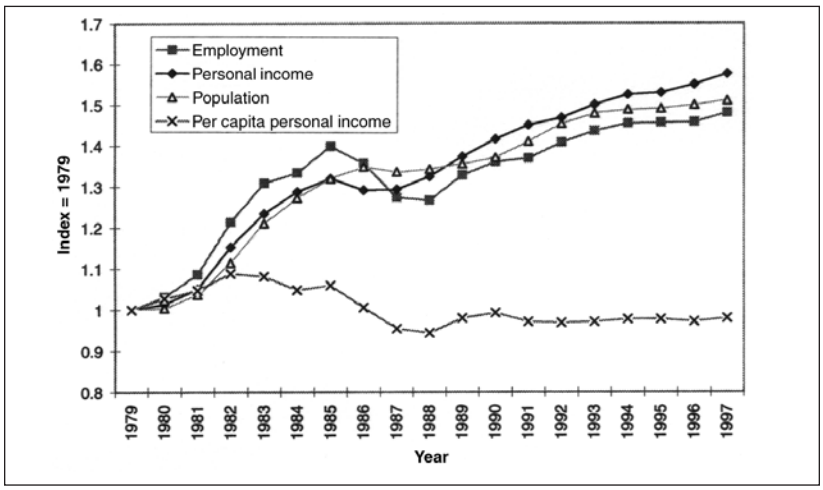


Figure 12b—Population, employment, and total and per capita personal income (1999 dollars) for Alaska, 1979-97, indexed to 1979 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

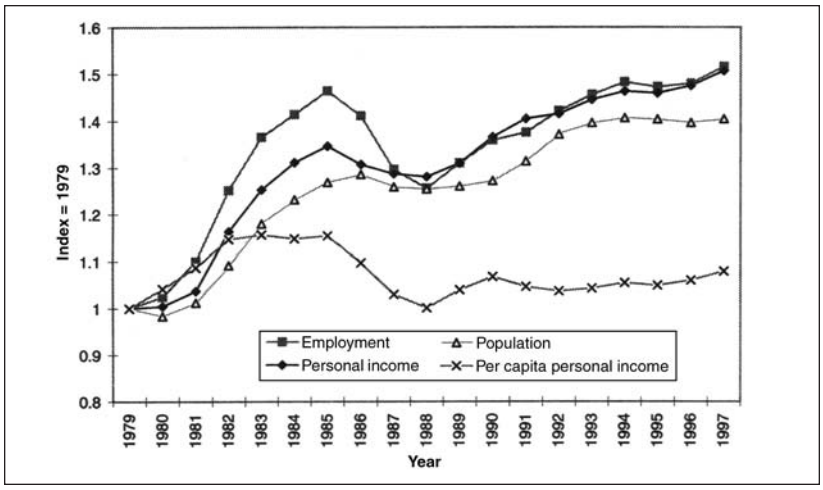


Figure 12c—Population, employment, and total and per capita personal income (1999 dollars) for the municipality of Anchorage, 1979-97, indexed to 1979 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

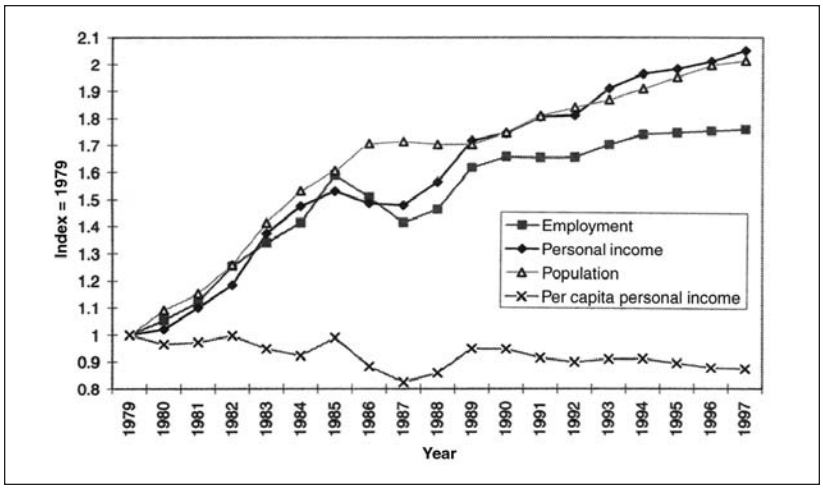


Figure 12d—Population, employment, and total and per capita personal income (1999 dollars) for the Kenai Peninsula Borough, 1979-97, indexed to 1979 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

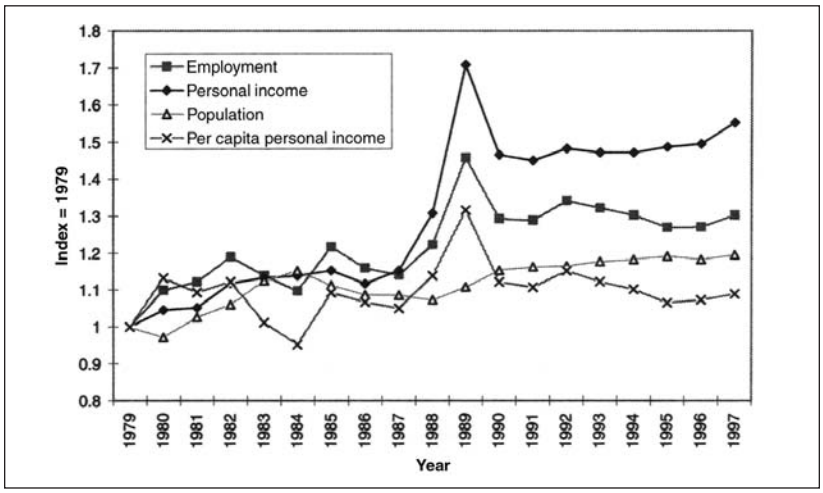


Figure 12e—Population, employment, and total and per capita personal income (1999 dollars) for the Valdez-Cordova Census Area, 1979-97, indexed to 1979 (Chugach planning team with data from U.S. Bureau of Economic Analysis 1999, Economic Report of the President 2000).

and respond to forest management changes in different ways and to different degrees.

Growth in both population and employment opportunities are higher in the region than in much of the rest of the country. The largest employment increases are in the retail trade and services sector. Although employment has increased, real per capita incomes have declined toward the national average because many of the new jobs are seasonal or pay lower wages than other year-round opportunities. If regional economic activity continues to follow the current patterns of change, the region will likely more closely resemble the United States in the future. This could mean further reduction of per capita income, but increased economic diversification.

Table 12 shows projected annual growth rates for Alaska and the three borough/census areas for population and selected economic indicators for the next 10 years. These are the base-case projections from Goldsmith (1998, 1999) and are derived from a set of assumptions regarding the most likely future levels of basic industry activity within the state, national variables, and state fiscal policy variables.

The Valdez-Cordova area has the lowest projected annual growth rate for population, employment, and total personal income as well as the largest projected negative annual growth rate for per capita income.Of the three areas, the Kenai Peninsula Borough has the largest projected annual growth rate for population and employment, whereas Anchorage has the largest projected annual growth rate for total personal income. In relative terms,

**Table 12—Population, employment, and income projections for Alaska and south-central Alaska (annual average growth rate, 2000-2010)**

| Variable | Alaska | Municipality of Anchorage | Kenai Peninsula Borough | Valdez-Cordova Census Area |
|---|---|---|---|---|
| | | *Percent* | | |
| Population | 1.46 | 1.33 | 1.48 | 1.30 |
| Wage and salary employment | 1.14 | .99 | 1.08 | .90 |
| Total personal income | 1.42 | 1.27 | 1.22 | .99 |
| Real per capita personal income (1995 dollars) | NA | -.06 | -.25 | -.32 |

NA = not available.
Source: Alaska data is from Goldsmith 1999; south-central Alaska data is from Goldsmith 1998.

the projected employment growth rates are similar to those for the 1990-97 period except that the projected Kenai Peninsula rate is lower than that projected for the state. If the shift-share patterns of 1990 through 1997 continue, this would imply that in all three borough/census areas, most sectors will experience slower employment growth locally than at the state level.

This regional overview has provided a general analysis of the economic and social structure of both the south-central Alaska region and the individual borough/census areas. At this stage, however, it is premature to analyze the manners or degree to which forest resources and management policies influence or are influenced by these structures. To do this, we must first take a closer look at both the resources and uses of the CNF and the characteristics of the industries and communities that use or enjoy these resources. In section 2, we will provide more detailed descriptions of industries that use forest-related resources as inputs.

## Section 2: Forest-Resource-Related Industries

This section concentrates on four industries: commercial fishing and processing, tourism and recreation, wood products, and minerals (including oil and gas) that use forest resources in production. These industries are directly dependent on forest-related resources and are the most likely to be impacted (positively or negatively) by CNF management. These industries require different levels of infrastructure development and amounts of forest-related resources in their production processes. The CNF provides habitat for salmon that require fresh water for the reproductive part of their life cycle. The CNF also provides settings and opportunities for tourism and recreation activities. Harvesting of trees from the CNF provides resources used in wood production activities. Extraction of mineral resources from the CNF is regulated by specific legislation and differs by surface and subsurface ownerships. These industry activities occur inside and outside the CNF, and in many cases, the CNF is not the only source of the resource.

Data for the following analysis are from IMPLAN Pro ZIP Code models and data (Minnesota IMPLAN Group, Inc. 1999). These data allow for the separation of communities and include detailed information not available from other state or federal data sources. The tradeoff is that the latest data available are for 1996. Other sources of current data are available and are used elsewhere in this assessment. The data in these sources, however, are at a larger scale, include communities not in the study area, and are not always available for specific sectors. IMPLAN allows communities to be combined so the model area can be tailored specifically to the study area.

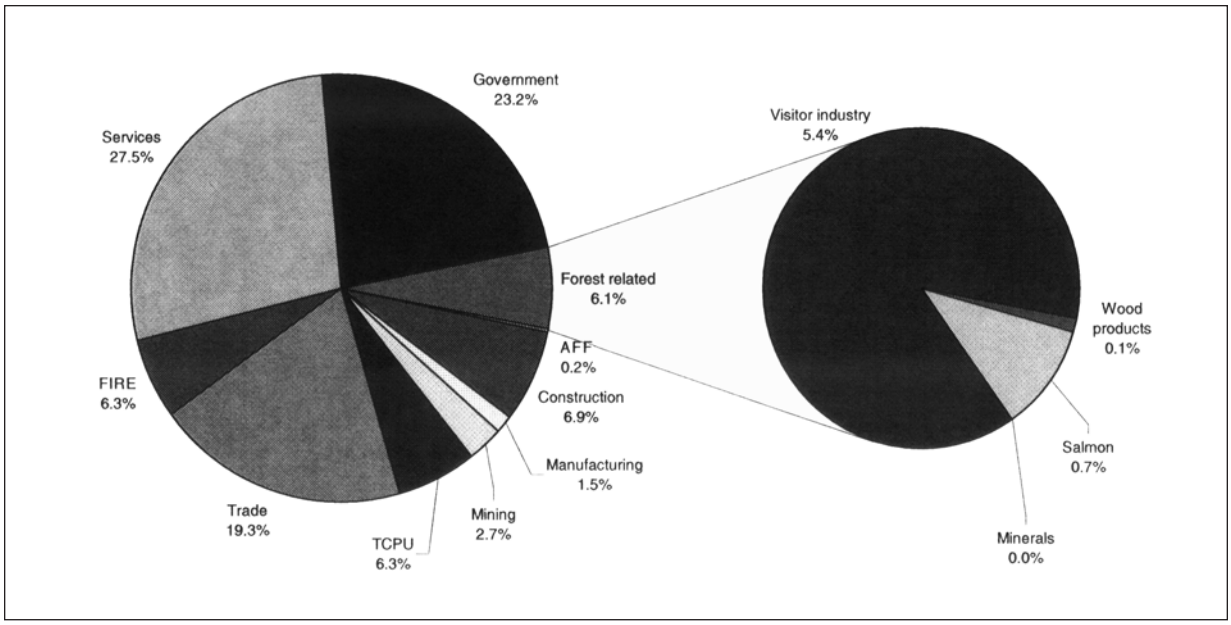


Figure 13—Estimated composition of employment by sector for Anchorage in 1996 (Chugach planning team with data from Minnesota IMPLAN Group, Inc. 1999, McDowell Group 1991).

For this analysis, the study area is divided into three smaller areas for separate analysis: Anchorage, Kenai-Soldotna (including Sterling), and communities within or near the CNF boundary (Chenega Bay, Cooper Landing, Cordova, Girdwood, Hope, Moose Pass, Seward, Tatitlek, Valdez, and Whittier). These three groupings were chosen to prevent the larger areas of Anchorage and Kenai-Soldotna from overshadowing employment conditions in the smaller communities and to highlight differences in employment in the three areas.

Figures 13, 14, and 15 display percentage of total employment by sector with industries dependent on forest resources summarized as a separate "forest-related" category. The forest-related category is further broken out by forest-resource-related sectors shown in the smaller charts. The forest-related category includes commercial fishing (commercial fishing and seafood processing), wood products (logging and sawmills), minerals other than gas and oil, and the visitor industry. The visitor industry was constructed based on a 1991 McDowell Group survey of Alaska businesses involved in providing goods and services to visitors (McDowell Group 1999a). This category includes both tourists and business travelers but does not include resident recreation. McDowell's survey indicates that about 73 percent of the total visitor industry is associated with tourism. This analysis highlights those industries that use forest-related resources in their production process, but does not isolate the proportion of the forest-related resource used by each industry that comes specifically from the CNF.

Anchorage has both the largest population base and the largest workforce in Alaska. As displayed in figure 13, in 1996, 6 percent of total employment came from industries that use forest-related resources. Of this forest-resource-related employment, most (5.4 percent of total employment) was within the visitor industry. Anchorage serves as a hub for tourism activity with extensive retail, service, and transportation businesses, including an international airport. Little of Anchorage's workforce was employed in manufacturing or production activities that use forest-related resources as there was less than one percent employment in both the wood products and commercial fishing industries. Given the

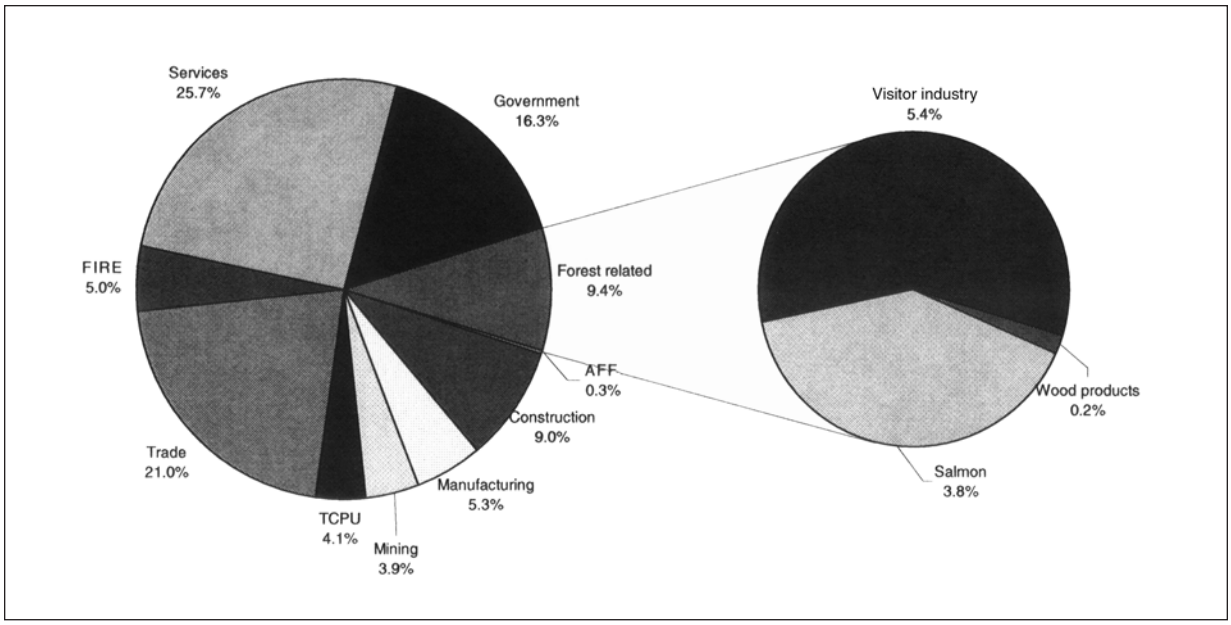


Figure 14—Estimated composition of employment by sector for Kenai-Soldotna in 1996 (Chugach planning team with data from Minnesota IMPLAN Group, Inc. 1999, McDowell Group 1991).

small proportion of total employment in industries that use forest-related resources, it is unlikely that CNF management activities will affect the overall level of economic activity in Anchorage.

The Kenai-Soldotna area also has a fairly large population base and serves as an economic hub to the smaller communities on the Kenai Peninsula. Figure 14 shows that this area had a larger proportion (9.4 percent) of total employment in forest-resource-related industries than Anchorage. An estimated 5.4 percent of total employment was in the visitor industry, and 3.8 percent was estimated in the commercial fishing industry. These findings highlight both the world-class sport fishing opportunities and the well-established commercial salmon fishing fleet and seafood processing infrastructure in the area. This area is similar to Anchorage in that changes in CNF management would likely have a limited impact on overall economic activity.

The remaining communities within the study area are smaller and, as a group, have significantly more employment in forest-resource-related sectors when compared to the Anchorage and Kenai-Soldotna areas. Figure 15 shows that 38.3 percent of total employment was in forest-resource-related industries. Employment in the commercial fishing industry accounted for over half the forest-resource-related employment. The communities of Cordova and Seward have large fishing fleets and several seafood processing plants. In the smaller, inland communities of Hope, Girdwood, Moose Pass, and Cooper Landing, residents also are involved in the commercial fishing industry. Although the visitor industry does not account for the largest share of employment in forest-resource-related industries, the percentage of total employment in the visitor industry is actually larger in this group of communities than it was in the Anchorage and Kenai-Soldotna areas. Several communities have large tourist attractions, such as the Alyeska ski resort in Girdwood, the Sealife Center in Seward, and sport fishing opportunities near Cooper Landing. Wood products employment is a small proportion of the forest-resource-related employment. Most of this employment is in logging and is primarily associated with harvests from Native corporation lands and other private lands.

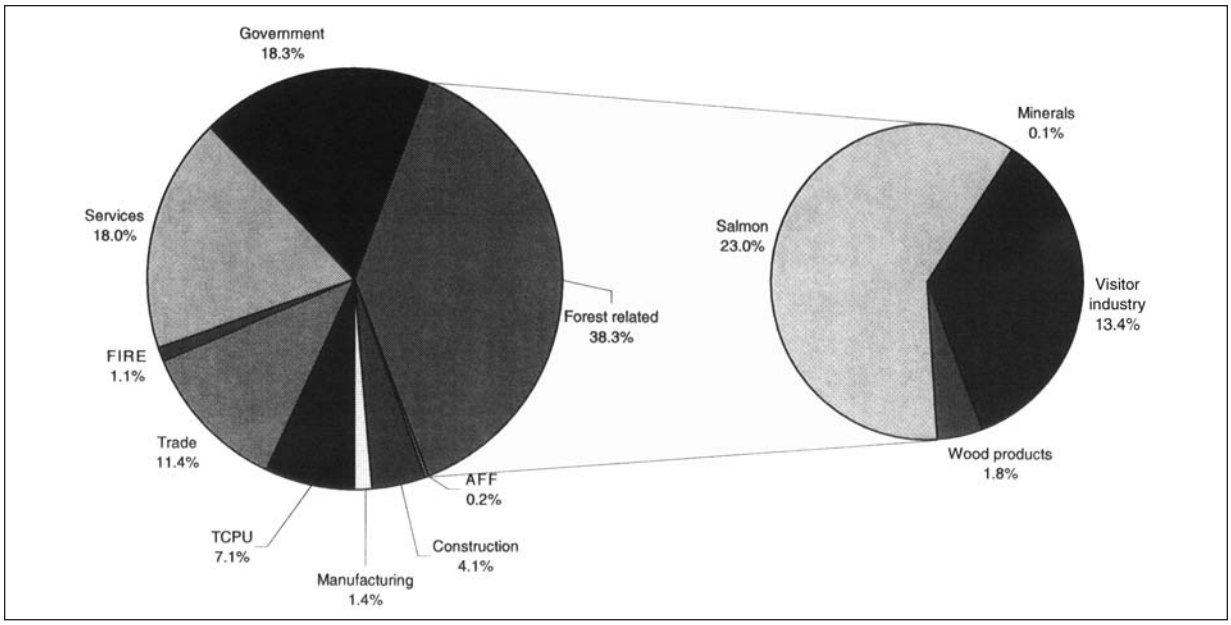


Figure 15—Estimated composition of employment by sector for communities within or adjacent to the Chugach National Forest boundary in 1996 (Chugach planning team with data from Minnesota IMPLAN Group, Inc. 1999, McDowell Group 1991).

With the forest-resource-related industries considered in the context of the larger south-central Alaska economy, the role that the CNF plays in providing employment opportunities is relatively small. Many people in the smaller and more isolated communities, however, are employed in forest-resource-related industries. For the visitor industry, the USDA Forest Service may not be directly involved in providing employment opportunities, but it is a significant provider of resources such as scenery, recreation settings, and fish and wildlife habitat.

In the following sections, the forest-resource-related industries are discussed in detail by using available information. Each industry is described in terms of its history, trends, and current situation. Comparisons are made between the state and the three regional areas where appropriate. Elements of resource supply and demand are discussed in general and with respect to the resources of the CNF. Estimates of 1996 direct employment, direct income, and average income are provided for each forest-resource-related industry and the sectors in that industry for each of the three areas.

## Commercial Fishing and Seafood Processing

The commercial fishery of south-central Alaska is an integral part of the region's economic activity. Existing commercial fisheries include five species of Pacific salmon, king crab, tanner crab, Dungeness crab, shrimp, herring, clams, halibut, and other bottom fish. The major emphasis of this assessment is given to commercial salmon fishing because it comprises most of south-central Alaska's commercial fishing industry and because this fishery is most influenced by forest land use. Salmon inhabit the fresh water of Prince William Sound streams and lakes at various times during their life cycle. Several species of wildlife and fish depend on the annual return of salmon and on the juvenile salmon produced in Prince William Sound streams and lakes.

The salmon industry in Alaska is heavily regulated by the state. The length of boats, nets, seasons, take, entry permits, and locations are all regulated for different fisheries. The permit system is designed to keep the number of people involved in commercial salmon harvesting at a

stable level, with employment and revenue distributed among a consistent number of operators. The state's involvement is to ensure adequate escapement for future salmon runs, allow sport fishery and subsistence users access to fish, and protect other resources. Several international agreements also come into play in determining allowable Alaska harvest levels. Within the confines of state regulations and permits, commercial salmon fishers continuously look for technological advancements and increased efficiency to decrease costs and increase pounds of fish per trip to remain competitive in the global salmon market.

Most salmon fishing in Alaska is made up of drift gill nets, set gill nets, and purse seiners. Most drift gill net and set gill net operators are small, employing one or two persons per permit, whereas purse seiners are larger with an average crew size of four to five persons per permit (McDowell Group 1989). Drift gill net and set gill net operators held about 80 percent of Alaska permits fished in 1997. The purse seiners, while holding only 10 percent of the permits fished in Alaska in 1997, landed about 52 percent of the total salmon volume in the state (McDowell Group 1999b).

The state does not allow finfish farming in state-managed waters. All salmon caught and processed in Alaska are considered wild—including the hatchery fish once they are released into the open ocean. Fish farming in other coastal states and in other countries has steadily increased since the early 1990s. The unpredictable year-to-year fluctuation in wild stocks is a permanent source of market instability, which increases the risk associated with investments in processing and marketing. Every decline in wild stocks creates an opportunity for farmed-fish operators to increase their market share.

Farmed fish are available year-round, can be transported fresh, have a predictable and reliable supply, and are generally cheaper than Alaska wild salmon (Hutchison 1999b). As more fish farms come on line and supply increases, prices will continue to drop, creating difficult times for Alaska salmon harvesters and processors. The demand for farmed salmon is increasing. Most people who eat salmon prefer the farmed salmon because of its lighter taste compared to wild salmon (Hutchison 1999c). People also seem to prefer farmed salmon because of its controlled sources of food, water, and living conditions as well as its cheaper prices (Hutchison 1999c). There is also an increase in public disapproval of commercial fishing because of over fishing, bycatch waste, ecological damage, endangered wild salmon and the competition with subsistence and sport fishing (Hutchison 1999a, 1999d, 1999e, 1999f, 1999g, 1999h, 1999i). The future of Alaska wild salmon may depend on finding a niche market where buyers are brand loyal and willing to pay more for wild salmon.

The wild salmon harvest from Alaska is about 90 percent of the total wild harvest in the United States, and about 42 percent of the world's wild salmon supply. However, Alaska's share of total world salmon supply, including farmed fish, declined 18 percent between 1996 and 1998, while the total tons of salmon harvested increased by 25 percent. Farmed fish are entering the salmon market and having significant impacts. Between 1985 and 1997, the market share of farmed fish increased from 7 to 46 percent (Salmon Market Information Service 1998).

The total Alaska commercial harvest of the five salmon species (chinook, coho, sockeye, pink, and chum) and prices paid from 1980 to 1997 are displayed in figure 16. Trends in prices are similar between species with all showing a general decline since 1992. The high prices in 1988 were due to a combination of lower harvests and the favorable exchange rate of the Japanese yen. After 1992, prices for all salmon species harvested in Alaska declined owing to both the global increase in farmed fish and the downturn in the Asian market.

The commercial fishery numbers included here at south-central Alaska are from only the Alaska Department of Fish and Game commercial fishing management areas of Prince William Sound because the CNF borders this area. Resurrection

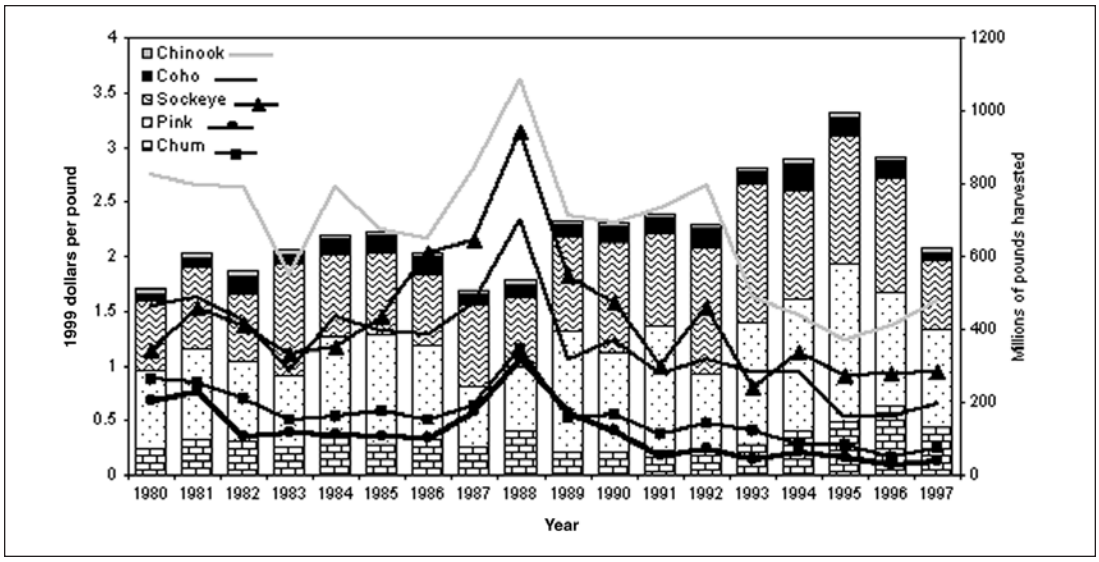


Figure 16—Alaska commercial salmon harvest and average price (1999 dollars) by species, 1980-97 (South-central Alaska numbers exclude Resurrection Bay and Cook Inlet because the related freshwater habitat is not managed by the Forest Service.) (Chugach planning team with data from Salmon Market Information Service 1999a,1999b; Economic Report of the President 2000).

Bay and Cook Inlet also are bordered by the CNF but are not included because most of the freshwater habitat is managed by land ownerships other than the Forest Service.

Several communities in the study area have a lot of employment in salmon harvesting and processing activities. Cordova has a large commercial fishing fleet, seafood-processing facilities, and serves as the headquarters for the Prince William Sound aquaculture operation. In Cordova, half of all households had someone working in commercial fishing, processing, or hatcheries in 1998 (Alaska Department of Labor 1998). Kenai-Soldotna, Valdez, Whittier, and Seward also have commercial fleets and seafood processing facilities. There are several large processing facilities and hatchery operations in Anchorage. Chenega Bay and Tatitlek do not have processing facilities. However, some people in these villages have commercial fishing permits, and there is some oyster farming activity.

In table 13, the 1997 number of commercial salmon fishing permit holders for each of the study area communities is displayed in terms of both the absolute number of permit holders and as a percentage of community population. Cordova had the largest percentage of its population holding permits. Anchorage had the largest number of permit holders but is tied with Sterling for having the lowest number of permits per capita.

There are three major types of commercial salmon permits used in Prince William Sound: purse seine, drift gill net, and set gill net. Table 14 summarizes the high and low prices and permits fished by type. Alaska residents own most of the permits; however, the number of Alaska residents who actually use their permits in any given year is not tracked. Commercial fishing is a volatile industry as operators move in or out of the industry depending on each year's prices, catch, regulations, and other industry conditions. The number of purse seine permits fished is declining. In 1999, there were 37 people with intent to transfer or sell their permits; 19 of those people were from study area communities. Statewide, gillnetting had the most permits issued. Of the 56 people in south-central Alaska who wanted to transfer their permits, 30 were from study area communities. Set gill netting shows the largest percentage variation in the number of permits fished. The 1989 *Exxon-Valdez* oil spill shut the fishery down for that year, and in the late 1970s, there were several years with few permits active. Currently there are four

**Table 13—Commercial salmon fishing permits by community, 1997**

| Community | No. of people holding permits | Percentage of 1997 population |
|---|---|---|
| Municipality of Anchorage | 902 | 0.35 |
| Kenai Peninsula: | | |
| Cooper Landing | 4 | 1.48 |
| Hope | 1 | .66 |
| Kenai | 223 | 2.39 |
| Moose Pass | 4 | 3.45 |
| Seward | 81 | 2.70 |
| Soldotna | 170 | 4.15 |
| Sterling | 20 | .35 |
| Prince William Sound: | | |
| Chenega Bay | 5 | 5.49 |
| Cordova[a] | 393 | 15.93 |
| Tatitlek | 3 | 3.03 |
| Valdez | 49 | 1.17 |
| Whittier | 14 | 4.84 |

[a] Eyak was annexed into Cordova in 1993.
Source: Alaska Commercial Fisheries Entry Commission 1999b.

**Table 14—Prince William Sound commercial salmon permit statistics, 1977-97**

| Prince William Sound permits | Total permits | Alaska resident | Most permits fished | Least permits fished | High average permit price | Low average permit price | 1997 permit price |
|---|---|---|---|---|---|---|---|
| | *Permits* | *Percent* | *- - - - Permits (year) - - - -* | | *- - - - - - - - - - 1999 dollars - - - - - - - - - -* | | |
| Purse seine | 269 | 71 | 268 (1981) | 90 (1996) | 290,227 (1989) | 35,825 (1996) | 37,292 |
| Drift gillnet | 541 | 74 | 533 (1985) | 393 (1980) | 193,907 (1990) | 24,254 (1977) | 69,558 |
| Set gillnet | 30 | 90 | 30 (1992-3) | 2 (1978) | 45,775 (1982) | 31,427 (1984) | NA |

NA = not available. Data for set net permits is not available for all years due to the small number of people involved.
Source: Alaska Commercial Fisheries Entry Commission 1999a, Economic Report of the President 2000.

people with intent to transfer their set gill net permits, and three of those are from study area communities (Alaska Commercial Fisheries Entry Commission 1999c).

Figure 17 displays an estimate of employment based on permit type and average crew employment and an income per employee figure based on yearly salmon revenues. Despite the permit system, employment has been less stable and income has been low since 1989. This perhaps is due to the 1989 *Exxon-Valdez* oil spill. The area is still in recovery 10 years later, and debate continues as to the total impact of the event on the fisheries in Prince William Sound. Fish harvests have been lower in recent years throughout Alaska. (Hutchison 1999c). This may be attributable to many factors including the 20-year cycle of ocean currents affecting salmon returns, farmed fish affecting supply, and the recent collapse of the Asian market affecting demand. Whatever the reasons, commercial salmon fishing in south-central Alaska is not as strong today as in the past. This trend will have the most impact in those communities in which salmon harvesting and seafood processing is a large contributor to economic activity.

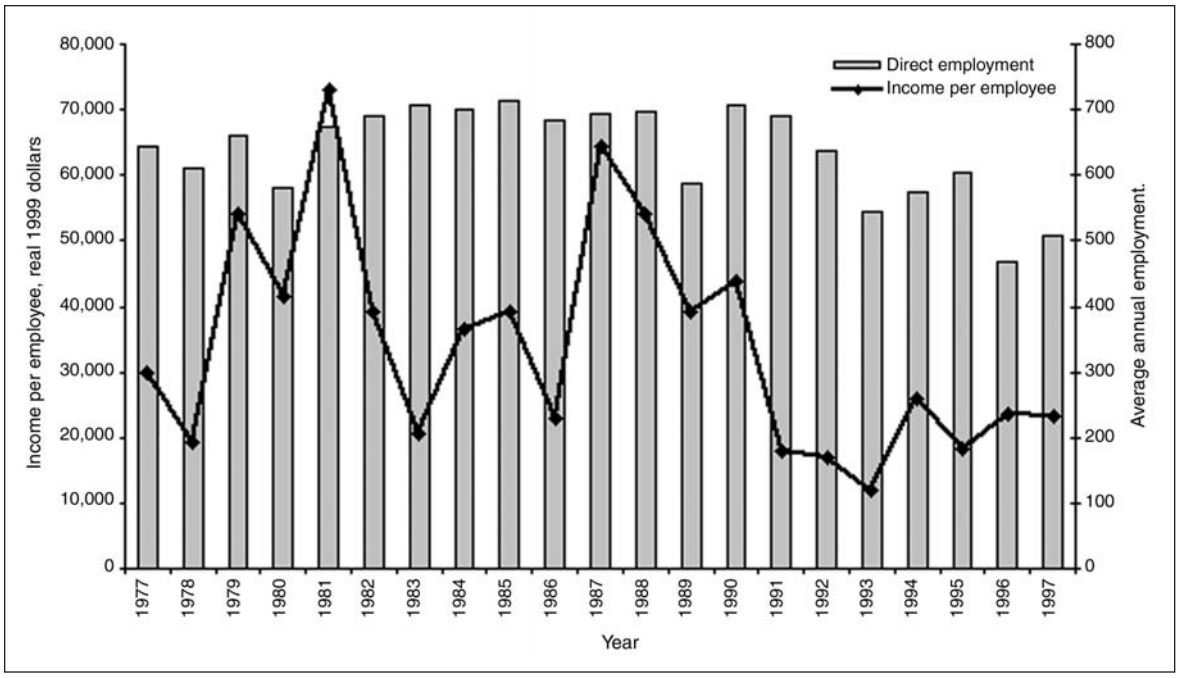


Figure 17—Employment and average income estimates (1999 dollars) for the Prince William Sound salmon industry, 1977-97 (Chugach planning team with data from McDowell Group 1989, Alaska Commercial Fisheries Entry Commission 1999a, Economic Report of the President 2000).

**Table 15—Employment and income of commercial fishing and seafood processing in the study area groups, 1996**

| Industry | 1996 direct employment | 1996 direct income | Average income |
|---|---|---|---|
| | *No. of jobs* | *- - - - -1999 dollars - - - - -* | |
| Anchorage area: | | | |
| Commercial fishing | 19 | 802,146 | 42,218 |
| Seafood processing | 77 | 1,642,937 | 21,337 |
| Kenai-Soldotna area: | | | |
| Commercial fishing | 27 | 1,087,284 | 40,270 |
| Seafood processing | 218 | 5,830,179 | 26,744 |
| Chugach communities: | | | |
| Commercial fishing | 507 | 20,791,034 | 41,008 |
| Seafood processing | 1,071 | 31,266,974 | 29,194 |

Source: Chugach planning team with data from Minnesota IMPLAN Group, Inc. 1999.

Table 15 highlights employment and income differences between the three community groups in the study area in 1996. The communities within or near the CNF boundary had more employment in this industry than the other two areas. The average commercial fishing income in the three areas was roughly equivalent. The communities within or near the CNF boundary had the highest seafood processing average income. The differences in average income highlight the differences between commercial fishing (average of boat owners and crew combined) and seafood processing. It is important to note that commercial fishing income depends heavily on market prices and the volume of fish caught. The 1996 figures reflect a good fishing year.

The commercial fishing and seafood processing sectors have some of the highest percentages of nonresident workers of all industries in the state. In 1997, the commercial fishing workforce was 47.1 percent nonresident, who were paid 34.8 percent of the total wages in the sector. The seafood-processing sector had an even higher percentage of nonresidents, 75.1 percent, in 1997. These workers received 64.9 percent of the wages (Hadland 1998). Seafood processing also had one of the lowest percentages of 1996 nonresident workers who became residents in 1997 (Hadland 1999). In general, nonresident seasonal work decreases the stimulus to local area economic activity as much of the income flows out of the area.

Currently, the major influences on commercial fishing in Prince William Sound are from factors other than Forest Service management. These factors include ocean currents, international fisheries, farmed salmon trends, state management of hatchery and finfish operations, and global demand for and supply of salmon. Although the outcome of these situations will affect the study communities, the USDA Forest Service may only be indirectly involved.

Although the USDA Forest Service is not directly involved in management of commercial fishing, it does manage much of the upland habitat for salmon. Salmon streams in the CNF are currently considered at maximum productivity with little possibility of improving natural production. Riparian and aquatic habitats are protected in all activities that have potential to affect fish habitat through the application of Forest Service Region 10 (the Alaska Region) aquatic ecosystem protection standards and best management practices. Forest processes such as bark beetle kill, windthrow, landslide, or culvert failure may significantly alter fish habitat in the areas in which they occur. Although such localized impacts would not affect all upland habitats at once, the potential exists for long-term cumulative impacts to the fisheries.

## Tourism and Recreation

Throughout this analysis, tourism refers to visitors from outside the state of Alaska, and recreation refers to residents of Alaska engaging in outdoor recreation pursuits. Recreation is often not considered as an economic impact to local areas because it is considered a circulation of local money rather than an inflow of outside money. Residents who decide to buy groceries for a picnic would probably have spent that money on local food anyway, so the opportunity to recreate is not likely to generate additional economic activity. Tourism is considered an export of local goods and services to visitors who bring outside money into the local area. People who decide to visit Alaska from elsewhere bring the money they would have spent at home or on other vacation opportunities to Alaska. Thus, tourism activity generates additional economic activity in the local area.

Owing to the large and increasing amount and types of recreation and tourism activities taking place in and around the CNF, as well as their economic and social importance to communities in the area, a separate set of assessments was conducted to focus specifically on these activities. The Pacific Northwest Research Station in support of the CNF land management planning effort commissioned two studies examining recreation and tourism. The first, Colt and others (2002), uses a sectoral approach to examine patterns and trends in recreation and tourism in south-central Alaska. The second, Bowker (2001), uses a formal, model-based approach to analyze recreation demand in Alaska, by activity. These studies are summarized and synthesized in Brooks and Haynes (2001) who also provide a comprehensive look at the recreation and tourism industry in south-central Alaska as well as the current and potential role of the CNF in this industry. Although some of the major findings of these assessments are incorporated in this section, interested readers are referred to the original documents for an indepth analysis of the industry and associated implications for CNF management activities.

The industry associated with serving visitors and residents is not easily identified. It is a mix of many industries. The research completed by the McDowell Group (McDowell Group 1991) is used here as a consistent definition of the visitor industry and includes the following: local and interurban transit, water and air transportation, transportation services, general retail, clothing stores, food stores, eating and drinking places, service stations, hotels and other lodging, personal services, auto repair, car rentals, and amusement and recreation services.

In the last 8 years, the McDowell Group (1999a) reports an average annual growth of about 5 percent in the visitor industry. About 80 percent of visitors move through Alaska in the summer (May through September). Southeast and south-central Alaska have the highest levels of visitors owing to cruise ship activities. South-central Alaska, which includes Anchorage, has the highest percentage of visitors in business travel. Along with the increase in tourism, the population of Alaska has increased. Population has increased at an average annual rate of 1.5 percent since 1990 (Alaska Department of Labor, Research and Analysis 1999a). Some of the largest increases are in south-central Alaska's Kenai Peninsula Borough and the municipality of Anchorage. The growing local population increases the number of residents looking for recreation opportunities on the CNF. As reported in Colt and others (2002), resident recreational use of the CNF is potentially four times that of tourist use.

According to the McDowell report (McDowell Group, 1999a), the 1998 visitor industry generated about 20,300 direct jobs and about $390 million in earnings in Alaska. The authors calculated that 8 percent of all state employment and 5 percent of total state earnings were directly related to visitor activities. Just over 50 percent of visitor-related jobs, about 10,800, were based in south-central Alaska (municipality of Anchorage, Mat-Su Borough, Kenai Peninsula Borough, and Valdez-Cordova Census Area).

The CNF contributes to south-central Alaska recreation and tourism activities by providing resources and opportunities for residents and visitors. The forest contributes to local quality of life by providing communities with recreation opportunities in their "backyards." Tourism opportunities also are provided through scenery management, access to resources and facilities, and permitted commercial uses. The CNF land base is inventoried through the recreation opportunity spectrum into nine general types of settings available to people engaging in outdoor experiences. For details on this inventory and the types of settings, see Colt and others (2002).

Based on the management of this supply of settings, future opportunities will change. As activities and technology change, people may demand different settings from the CNF. For example, the move from nonmotorized access to motorized activities including snow machines, ATVs, and helicopter use. Allowing these activities could change current settings and possibly displace current nonmotorized uses to other areas in the CNF. The visitor industry is likely to take advantage of these different settings by providing visitors and residents with various outdoor opportunities. Communities often benefit economically from jobs and increased money flowing through the local economy from visitor industry use of the CNF. However, the same community also may have their local quality of life compromised in terms of crowding, displacement, declined success in subsistence activities, and inflated prices.

By staying abreast of local, regional, and national changes in demographics, economic conditions, tastes and preferences, and technologies, the Forest Service can tailor its land management strategies to account for user demand. A different mix of resource opportunities can be offered through the building of facilities, management of access, hardening sites to accommodate increasing use, or dispersing people in areas to prevent resource damage, crowding, or displacement of current users. Tourism and recreation interests such as access, scenery, and solitude need to be balanced with management of wildlife

**Table 16—Employment and income of recreation- and tourism-related sectors in the study area groups, 1996**

| Area and industry | 1996 Recreation—tourism direct employment[a] | Average sector income[b] |
|---|---|---|
| | *No. of jobs* | *1999 dollars* |
| Anchorage area: | | |
| Local transport | 780 | 18,187 |
| Water transport | 286 | 53,192 |
| Air transport | 1,470 | 55,563 |
| Transport services | 343 | 26,024 |
| General merchandise | 245 | 22,102 |
| Clothing stores | 40 | 16,683 |
| Food stores | 82 | 28,103 |
| Eating and drinking | 1,690 | 17,679 |
| Service stations | 200 | 33,703 |
| Miscellaneous retail | 431 | 15,879 |
| Hotels—lodging | 1,224 | 19,675 |
| Personal services | 9 | 22,436 |
| Auto repair and car rental | 78 | 20,868 |
| Recreation services | 1,763 | 14,174 |
| Kenai-Soldotna area: | | |
| Local transport | 20 | 17,905 |
| Water transport | 4 | 32,610 |
| Air transport | 34 | 38,403 |
| Transport services | 11 | 34,728 |
| General merchandise | 20 | 17,332 |
| Clothing stores | 4 | 14,492 |
| Food stores | 13 | 25,255 |
| Eating and drinking | 125 | 14,261 |
| Service stations | 19 | 24,645 |
| Miscellaneous retail | 58 | 18,239 |
| Hotels—lodging | 263 | 13,301 |
| Personal services | 0 | 8,530 |
| Auto repair and car rental | 5 | 22,489 |
| Recreation services | 152 | 14,405 |
| Chugach communities: | | |
| Local transport | 38 | 19,234 |
| Water transport | 97 | 39,791 |
| Air transport | 20 | 40,850 |
| Transport services | 17 | 49,834 |
| General merchandise | 1 | 18,148 |
| Clothing stores | 1 | 11,663 |
| Food stores | 5 | 25,519 |
| Eating and drinking | 105 | 15,285 |
| Service stations | 8 | 24,380 |
| Miscellaneous retail | 27 | 16,481 |

**Table 16—Employment and income of recreation- and tourism-related sectors in the study area groups, 1996 (continued)**

| Area and industry | 1996 Recreation—tourism direct employment[a] | Average sector income[b] |
|---|---|---|
| | *No. of jobs* | *1999 dollars* |
| Hotels—lodging | 871 | 18,231 |
| Personal services | 0 | 28,592 |
| Auto repair and car rental | 1 | 24,584 |
| Recreation services | 220 | 14,485 |

[a] Employment represents the jobs associated with recreation and tourism activity (McDowell 1991).
[b] Income represents the average income (per job) associated with the entire sector, not specifically with recreation and tourism employment in that sector.
Source: Chugach planning team with data from Minnesota IMPLAN Group, Inc. 1999.

and their habitat, subsistence use, resource development and extraction, watershed protection, and other resource regulations and uses.

As mentioned earlier, it is difficult to collect employment and income statistics for the economic activity associated with recreation and tourism because the activity occurs in many different sectors. Table 16 displays estimated 1996 employment and income for the sectors identified by the McDowell Group's 1991 tourism study as representative of the tourism and recreation industry. These estimates include all activity in these sectors, not just tourism-related employment and income. Table 16 reveals some interesting aspects of the employment and income related to recreation and tourism activity.

Although the proportion of employment and income in individual sectors differs across the three groups of communities, there are a few similarities. In all three areas, the highest average incomes occur in the water transport, air transport, or transport services sectors. All three groups of communities also have several of the same sectors in which average incomes are less than $20,000. Two of these lower-average-income sectors (eating and drinking, and miscellaneous retail) have some of the highest levels of employment in all three areas. There are only slight variations in individual sector average incomes across the three areas. Anchorage generally has higher average incomes, especially in the water and air transportation sectors. This likely is due to the relatively large dock facilities, international airport/cargo service, and location of business headquarters and meetings in the area rather than to tourism-related activities. Similarly, the high average income in the Chugach communities is mostly due to the Trans Alaska pipeline terminus in Valdez rather than to tourism activities.

Similar to the salmon harvesting and processing industry, tourism in south-central Alaska is largely a seasonal business and attracts a large portion of nonresident workers. The highest nonresident proportions are seen in the hotel/motel sector with nonresidents holding almost 33 percent of employment and earning 20.5 percent of sector wages. The eating and drinking sector is slightly lower with their workforce employing 29.8 percent nonresidents who earn 17.6 percent of the wages. Of the workforce employed in recreation jobs (outfitters and guides), 27.8 percent were nonresidents taking in 15.8 percent of these wages. Local transportation had the lowest nonresident proportions with 20.2 percent of nonresidents employed, earning 14.7 percent of the sector wages (Hadland 1998). As stated earlier in the commercial fishing section, generally the larger the proportion of nonresidents employed in an industry, the less local impact there will be as much of the nonresident wages are likely to leave the state.

Recreation and tourism are important economic activities in the study area communities, and future management will continue to influence use of the CNF by resident recreationists and

tourists. Brooks and Haynes (2001) suggest that relatively higher rates of economic growth and growth in per capita income in the lower 48 states, as compared to Alaska, lead to higher rates of growth in tourism as compared to resident recreation. Current trends, as outlined in Colt and others (2002), suggest that growth is slowing for some types of tourism, such as cruise ships, but increasing for other activities, such as soft adventure and winter sports. Some communities are interested in structuring their development activities to take advantage of opportunities to attract visitors to their area. Some small operators are tailoring tour packages to meet the desires of the time-poor and money-rich independent travelers and Alaska residents who visit the area.

The CNF will play a significant role in future patterns and trends in recreation and tourism in south-central Alaska by providing opportunities through infrastructure and access. Wildlife viewing and scenery are the primary uses of the CNF by both residents and nonresidents (Colt and others 2002). Decisions that affect CNF resources could have significant impacts on both the quantity and quality of user experiences. The CNF cannot, by itself, ensure any specific future for the tourism industry as decisions to take advantage of forest-related resources also are based on private sector influences. The level and location of many future recreation and tourism activities, and developments are likely to depend on the interaction of both public and private sector infrastructure development and land management choices. This is especially true because the Forest Service has a policy of not developing opportunities that would directly compete with private developers.

## Wood Products

The wood products industry in Alaska began in the early 1900s in support of other industry growth. Construction of the railroads, pilings for fish canneries, and timbers for mining structures demanded significant wood products from the local area. Development of communities around these industries also required wood products. Most communities had small mills for construction of houses and other community infrastructure. These small mills were abandoned as readily accessible timber was depleted and lumber from outside Alaska was made available. As the mining and railroad industries declined, and wood substitutes were found for fishing boxes, demand for local wood products declined and the wood products industry searched for new markets.

Beginning in 1926, sawmills in Seward, Hope, Bird Creek, Cooper Landing, and Cordova were operated to process CNF timber into cants (round logs cut lengthwise into quarters) for export. Today, there are three small sawmills using some CNF timber in the production of rough-sawn dimension lumber and timbers, house logs, and chips. Timber from the national forest has the additional requirement of primary processing within the local area (36 CFR 223.201). This increases opportunities for sawmill employment, but in south-central Alaska, it also may decrease the competitiveness of the final wood product. The three sawmills currently operating (including one in Anchorage and one in Cooper Landing within the study area) have a combined estimated installed capacity of 2 million board feet (MMBF) per year. The Alaska Spruce Products mill employs about 30 people, filling a niche market by supplying finished lumber to Home Depot and Artic Builders Supply in Anchorage (Fried and Windisch-Cole 1999).

The timber supply figures for the CNF, the state, and private lands in south-central Alaska are displayed for fiscal years 1987 through 1998 in table 17. Most of the south-central Alaska timber supply comes from 40 million acres of land owned by various Native corporations. About 1 percent of total south-central Alaska timber comes from the CNF and 2 percent from state lands. In recent years, the harvest of state saw logs has increased owing to the spruce bark beetle (*Dendroctonus rufipennis* Kirby) infestation and forest health issues. On average, the CNF has supplied an even mix of sawtimber and utility wood over the last 10 years with a total annual average harvest of 2.1 MMBF. By comparison, timber supply from Native corporation lands began in earnest in 1986 and continues with an average annual volume over the last 10 years of

**Table 17—South-central Alaska timber harvesting, fiscal years 1987-98**

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Millions of board feet* | | | | | | | | | | | |
| Chugach National Forest: | | | | | | | | | | | | |
| Sawtimber | 0.7 | 1.0 | 1.1 | 1.1 | 1.1 | 0.5 | 1.7 | 0.0 | 1.1 | 1.3 | 0.8 | 0.8 |
| Utility | .0 | .0 | .4 | .4 | .4 | .0 | .0 | 6.5 | .8 | 2.0 | 1.4 | .7 |
| Total | 0.7 | 1.0 | 1.5 | 1.5 | 1.5 | 0.5 | 1.7 | 6.5 | 1.9 | 3.3 | 2.2 | 1.5 |
| State of Alaska: | | | | | | | | | | | | |
| Sawtimber | 1.1 | .5 | .5 | .4 | 1.7 | .8 | .0 | .0 | 2.6 | 8.1 | 8.6 | 5.0 |
| Utility | .8 | 1.6 | 1.6 | .6 | .8 | .2 | .0 | .0 | .0 | .0 | .0 | .1 |
| Total | 1.9 | 2.1 | 2.1 | 1.0 | 2.5 | 1.0 | 0.0 | 0.0 | 2.6 | 8.1 | 8.6 | 5.1 |
| Private: | | | | | | | | | | | | |
| Export saw logs | 44.2 | 79.2 | 120.0 | 105.1 | 134.5 | 123.5 | 127.2 | 186.0 | 210.6 | 199.6 | 197.6 | 88.7 |
| Pulp logs | .0 | 6.4 | .0 | .0 | .0 | .0 | .0 | .0 | 19.5 | 8.0 | 39.7 | 83.5 |
| Total | 44.2 | 85.6 | 120.0 | 105.1 | 134.5 | 123.5 | 127.2 | 186.0 | 230.1 | 207.6 | 237.3 | 172.2 |
| Total sawtimber harvest | 46.0 | 80.7 | 121.6 | 106.6 | 137.3 | 124.8 | 128.9 | 186.0 | 214.3 | 209.0 | 206.8 | 94.5 |
| Total harvest | 46.8 | 88.7 | 123.6 | 107.6 | 138.5 | 125.0 | 128.9 | 192.5 | 234.6 | 219.0 | 247.9 | 178.8 |

Source: USDA Forest Service 1998b.

about 164 MMBF. Timber harvested on Native corporation lands does not require primary processing by law and is generally exported as saw logs. Over the past 10 years, saw log exports accounted for about 90 percent of all Native corporation timber harvest. Recently, however, the mix between saw log and pulp log is about even. This decline in log exports follows a state trend and is perhaps reflective of troubled financial markets abroad (Brooks and Haynes 1997).

Table 18 displays the CNF allowable sale quantity (ASQ) (the quantity of timber that may be sold from a designated area covered by a Forest Service land use plan for a specified period) and the timber offered, sold, and cut for the 1985-99 period. The 1986 forest plan amendment limited timber sale offerings to an average of 6.3 MMBF per year for 1985 through 1989 and 10.6 MMBF per year for 1990 through the present. In the first 10 years of the plan, 1984 to 1993, an average of 2.3 MMBF was harvested annually—significantly less than the ASQ ceiling. The high offered and cut volumes in fiscal year 1997 were related to the high market prices in the mid-1990s. During that time, the CNF prepared a large amount of volume under contract, much of it cut. Both prices and volumes have declined since then. The currently installed sawmill capacity to process timber in south-central Alaska is about 2 MMBF per year. Most recent sales are related to forest stewardship, personal use firewood, fire protection and management, road right-of-way clearings, and spruce bark beetle infestation rather than for the commercial timber industry.

Aside from commercial timber production, the CNF supports a significant amount of personal use (house logs, posts, poles) and Alaska free-use (firewood) wood permits. Although the CNF receives no payment for these activities, the personal- and free-use supply supports some local economic activity as people hire loggers and mills to custom process or deliver wood. Most of the personal-use activity occurs on the Kenai Peninsula owing to timber resources and access from the existing road system.

Personal-use permits have accounted for 100 to 500 thousand board feet (MBF) per year over the last 13 years. Free-use permits between 1994 and 1997 have averaged 555 MBF per year, with an

**Table 18—Chugach National Forest timber offered, sold, and cut, fiscal years 1985-99**

| Fiscal year | Allowable sale quantity | Volume offered | Volume sold | Volume cut |
|---|---|---|---|---|
| | | *Millions of board feet* | | |
| 1999 | 10.6 | 0.5 | 0.2 | 0.4 |
| 1998 | 10.6 | .1 | .2 | 1.4 |
| 1997 | 10.6 | 14.5 | 9.5 | 2.2 |
| 1996 | 10.6 | 2.1 | 2.7 | 3.3 |
| 1995 | 10.6 | 5.6 | 3.6 | 1.9 |
| 1994 | 10.6 | 1.2 | 2.8 | 6.6 |
| 1993 | 10.6 | 2.8 | 11.8 | 6.1 |
| 1992 | 10.6 | 5.0 | 2.3 | 2.4 |
| 1991 | 10.6 | 7.1 | 1.3 | .9 |
| 1990 | 10.6 | 4.0 | 4.2 | .5 |
| 1989 | 6.3 | 1.1 | 3.3 | 1.5 |
| 1988 | 6.3 | 2.0 | .8 | 1.0 |
| 1987 | 6.3 | 3.1 | 1.5 | .7 |
| 1986 | 6.3 | 2.0 | .8 | .8 |
| 1985 | 6.3 | 2.0 | .1 | .7 |
| Average | -- | 3.5 | 3.0 | 2.0 |

Source: USDA Forest Service 2000.

additional 50 to 100 MBF per year of dead and downed wood for which no permit is needed. Future personal- and free-use demand is estimated at 655 MBF annually and is likely to increase over the years as the populations of communities surrounding the CNF continue to increase (USDA Forest Service 1998a).

In 1997, there was an annual average of 1,900 logging and sawmill jobs in Alaska, 2,400 during the August-September peak. This is a significant decrease from the 1990 high annual average of 4,000 jobs. This decline is associated with decreases in annual harvest levels and the closure of both pulp mills in the southeast region. From 1985 to 1995, less than 3 percent of the state's total timber harvest was from the CNF. In 1997, there were almost 300 jobs in the wood products industry within the three borough/census areas, with most of these jobs associated with logging operations on Native corporation lands (Alaska Department of Labor, Research and Analysis 1999b, USDA Forest Service 1998b). Table 19 shows that there is some variation in the average income for wood product jobs between the three areas. Native corporation harvesting supports most logging in the communities within or near the CNF boundary. The CNF is a small supplier to this industry. Market conditions have changed since 1996 so employment figures in table 19 may not reflect the current situation, but average incomes are probably similar.

In 1997, nonresidents made up about 40 percent of the wood products industry workforce with most of those workers employed in the logging sector (Hadland 1999). Based on permanent fund dividend returns, about 10 percent of these nonresident workers became residents.

The CNF is likely to remain a small supplier to the wood products industry in the future with timber harvest a byproduct of other resource management objectives such as forest health.

## Minerals

There are three types of activities associated with the minerals industry in Alaska—development, production, and exploration. Development

**Table 19—Employment and income of the wood products industry in the study area groups, 1996**

| Industry | 1996 direct employment | 1996 direct income | Average income |
|---|---|---|---|
| | *No. of jobs* | *1999 dollars* | |
| Anchorage area: | | | |
| Logging | 54 | 2,784,532 | 51,565 |
| Sawmills | 38 | 1,369,288 | 36,034 |
| Kenai-Soldotna area: | | | |
| Logging | 22 | 1,069,528 | 48,615 |
| Sawmills | -- | -- | -- |
| Chugach communities: | | | |
| Logging | 173 | 10,128,135 | 58,544 |
| Sawmills | 16 | 651,743 | 40,734 |

Source: Chugach planning team with data from Minnesota IMPLAN Group, Inc. 1999.

activity—the construction of infrastructure associated with new sites—has recently declined sharply with the completion of several large projects. Owing to low mineral prices in 1998, no new large development projects are currently being considered. Most employment in the mineral industry is associated with the development phase. Once development is completed, operations move into production. Changes in global markets and commodity prices affect mineral development most. Mineral production activities in 1998 were valued at $903.6 million, which was a 3.5-percent decrease from 1997. Although equal or higher quantities were produced in 1998, overall revenues were lower because of low prices. Exploration activities, or searching for potentially productive sites, are not as directly linked to global markets and commodity prices as the other two activities and tend to be more stable over time. In 1998, the exploration activity in Alaska declined only 2 percent from 1997 levels. Total statewide employment associated with all mineral activity was estimated at 3,452 full-time equivalents in 1998, down 11 percent from the decade high in 1997 (Szumigala and Swainbank 1999).

In south-central Alaska, there is a long history of mining. Currently on CNF system lands, there are between 70 and 90 active plans of operation, mostly for seasonal or part-time placer gold mining, producing about 700 ounces per year. In addition, there are a few small-scale lode gold explorations at historic gold mines, and five industrial sand and gravel pits. Mining activity on the CNF accounts for less than 1 percent of the total mineral industry in Alaska. Commercial mining on the CNF is expected to remain at this small scale. Residents are becoming more interested in recreational gold panning on the CNF, and the potential exists for increased visitor use within the expanding tourism industry (USDA Forest Service 1998a).

## Oil, Gas, and Coal

At the global scale, the United States was the third leading oil producer in 1998. Total U.S. oil production was 6.4 million barrels per day, with Alaska producing about 20 percent of that or 1.3 million barrels per day (Alaska Division of Trade and Development 1999b). Alaska accounts for about 30 percent of all oil reserves and 21 percent of total gas reserves in the United States. Historically, some oil was produced off the CNF at the Katalla/Controller Bay area. Currently, there are no producing wells, no recent production, and there have been no lease requests since 1997. Of the total acreage of the CNF, 97.5 percent has no oil or gas potential (USDA Forest Service 1998a).

The Trans Alaska pipeline impacts the regional south-central Alaska economy. Twenty-three percent of the Nation's domestic oil supply is

**Table 20—Employment and income of the minerals industry in the study area, 1996**

| Industry | 1996 direct employment | 1996 direct income | Average income |
|---|---|---|---|
| | *No. of jobs* | *- - - - -1999 dollars- - - - -* | |
| Sand and gravel | 6 | 177,558 | 29,593 |

Source: Chugach planning team with data from Minnesota IMPLAN Group, Inc. 1999.

carried through Valdez. With 81 percent of the funding for state government derived from royalties and taxes on oil, the communities surrounding the CNF benefit from oil and gas in terms of state programs and financial support (Alaska Division of Trade and Development 1999b). In the Bering River area on the east side of the CNF, coal deposits are classified as having substantiated resource potential. The deposit totals 37,000 acres with about 10,000 acres within the CNF boundary. There are no active coal mines or leases on the CNF in this area owing to the high cost of getting the coal out (USDA Forest Service 1998a). Coal is seen as a growth area for the minerals industry, which may increase future lease requests within the CNF coalfields (Alaska Division of Trade and Development 1999a).

With limited activity and mineral resources on the CNF, current levels of employment and income are relatively small. Oil and gas industry employment and income are fairly large in the Kenai-Soldotna, Anchorage, and Valdez areas. These mineral activities are outside the CNF and are not highlighted here.

Table 20 shows employment and income in the sand and gravel sector within the study area in 1996. Most of this activity occurs in the smaller communities within the CNF boundary. As for wood products, the market conditions for sand and gravel have changed since 1996, so employment and income figures may not reflect the current situation. Large projects such as the Whittier road and other state road upgrades and projects since 1996 have increased recent activity in this sector. Nonresident employment in sand and gravel is relatively small; most income earned in this industry is likely to stay in the state.

## Payments to the State

The National Forest Receipts Program, authorized by federal and state law in 1908, requires national forests to distribute 25 percent of all revenue earned from activities within the national forest to boroughs, cities, and regional educational attendance areas located within the national forest. These 25-percent funds are expended only for public roads and schools. Borough governments are given a lump sum and allowed to allocate the money between roads and schools, generally using the entire payment for schools. Communities within census areas are assigned road payments based on the total miles of road in the area, whereas school funds are allocated to each district based on total enrollment.

## Forest Service Revenues

The total revenue from the CNF from 1980 through 1998 (in 1999 dollars) is displayed in figure 18. The 25-percent payment is based on two sources of revenue to the CNF: forest receipts and capital improvements. Forest receipts include the receipts the forest collects from commercial uses of the forest such as power production facilities, minerals, timber sales, tourism special uses, and for individual uses of facilities such as campground fees. Capital improvements revenue includes collections for activities such as brush disposal, salvage sales, silviculture, timber sale improvements, and purchaser road credits.

Capital improvements generally make up about 15 percent of total forest revenue with salvage sales and silvicultural activities the largest components of capital improvements. Forest receipts have accounted for over 85 percent of total forest revenue in all years except in 1988, when purchaser road credits were 50 percent of total

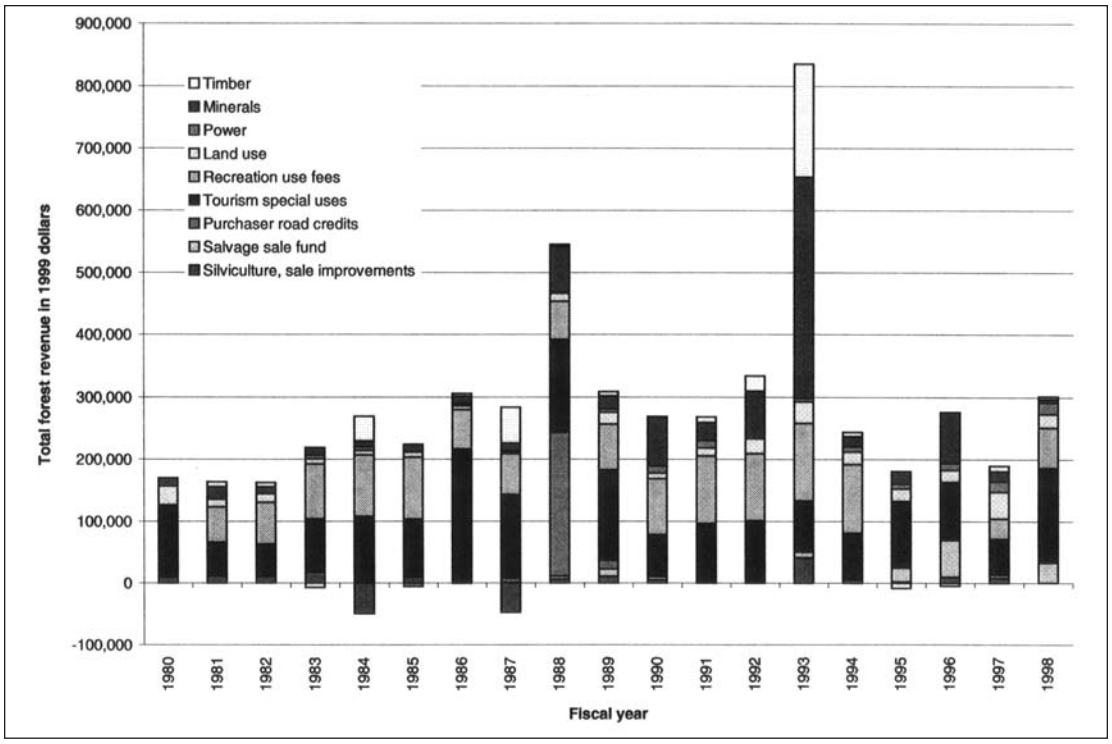


Figure 18—Chugach National Forest total revenue (1999 dollars), fiscal years 1980-98 (USDA Forest Service 1999, Economic Report of the President 2000).

revenue, and in 1996, when salvage sales were 25 percent of total revenue. Tourism and recreation-related receipts are generally the largest proportion of forest receipts, accounting for over 50 percent of the total in most years. In years with large mineral or timber sale projects, the recreation and tourism percentage declines. Forest receipts averaged $296,600 between 1990 and 1998, which is 93 percent of average total forest revenue over the same period.

In 1999, purchaser road credits were eliminated from the commercial timber program and therefore are no longer counted as revenue to the CNF. Declines in total payments to states throughout the United States owing to declining timber harvests and lost road credits has led to a proposal to stabilize payments at the 1997 level. Such a change could have significant effects on future payment levels to the communities surrounding the CNF.

## Forest-Resource-Related Industries Summary

This section focuses on industries likely to be most directly affected by CNF management policies. The limited resource potential and high cost associated with accessing, extracting, and transporting wood fiber and mineral resources limit the impact forest management policies can have on the overall level of economic activity in the wood products and mineral industries. Commercial fishing is an important contributor to economic activity in two of the three subregions. The major impacts CNF management activities can have on this industry is through the effects these activities have on the freshwater habitat of salmon. Currently, these impacts are small relative to other influences on the industry such as external market forces. Recreation and tourism are the forest-resource-related industries likely to be most affected by forest management policies.

See Brooks and Haynes' (2001) assessment for a synthesis of the current and future outlook for these industries in south-central Alaska and their relation to CNF resources and management activities.

In Section 2, we concentrate on providing both regional and subregional descriptions of the industries that use forest-related resources. In Sections 3 and 4, the geographic scale of analysis narrows to individual communities, whereas the scope of descriptive characteristics widens to include social and economic conditions as well as values, perceptions, and interests.

# Section 3: Community Social and Economic Conditions

This section serves as a comparison and description of the social and economic conditions of communities within or near the Chugach National Forest. Because each community has its own history, current identity, and social and economic trends and conditions, it is important to make forest plan decisions with knowledge of these forest communities

Communities come in many shapes and sizes. The places where, and people with whom, you live, work, recreate, and have an interest can all serve as communities. This analysis focuses on communities defined at a political boundary, such as a borough, census area, city, and town. Although such a boundary may not encompass the entire economic or social network of a community, it is a unit for which social and economic data are collected and available. As discussed in the following community surveys section, when asked to define their communities, many residents do not use political boundaries but instead use common geographical areas.

In this analysis, 1990 national census data (collected for Alaska in 1989) is used as a baseline to compare more recent trends and information. The national census is taken every 10 years and is the only source of complete employment and income data available at the community level. Annual employment data that are available from the Alaska Department of Labor do not include self-employed people and therefore are not reported at the community level. Income data are not releasable by the department in any detail owing to state nondisclosure laws that are enforced to protect the privacy of individual firms. This is particularly troublesome when many of the communities of interest are so small that most information is not disclosed. The data that are available are analyzed and presented to update census data.

The section first provides comparisons of community populations, subsistence preference, demographics, housing characteristics, employment, income, and education. Next, the major community concerns identified by the CNF planning team through scoping, public meetings, correspondence, and other personal communications with citizens, local business people, forest managers, and policymakers are outlined. Brief descriptions of each community then follow.

## Community Population, Demographics, and Characteristics

The communities included in the assessment are within or near the CNF. They are the municipality of Anchorage (includes Girdwood, Indian, and Portage), Chenega Bay, Cooper Landing, Cordova, Hope, Kenai, Moose Pass, Seward, Soldotna, Sterling, Tatitlek, Valdez, and Whittier. These communities are diverse in terms of size, location, access, demographics, economic structure, and other social characteristics. Table 21 illustrates some differences by comparing a few social and economic variables for each of the 14 communities grouped by their larger geographic area: municipality of Anchorage, the Kenai Peninsula, and the Prince William Sound. These geographical groupings are roughly equivalent but do not encompass as much area or as many communities as the municipality of Anchorage, the Kenai Peninsula Borough, and the Valdez-Cordova Census Area groupings used in Section 1.

The population in almost all of the communities has increased since 1980, but the Kenai Peninsula communities have grown the most. Access to highways and road expansion tends to support greater growth in communities. Such a pattern

**Table 21—Overview of Chugach National Forest community characteristics**

| Community | 1980 | 1990 | 1998 | 1990-98 change | 1990 female | 1990 civilian unemployed | 1990 not in labor force | Access[a] | Subsistence preference |
|---|---|---|---|---|---|---|---|---|---|
| | *Population* | | | *Percent* | | | | | |
| Municipality of Anchorage: | 174,431 | 226,338 | 258,782 | 14 | 49 | 7 | 26 | Road | Nonrural |
| Girdwood | 577 | 1,115 | 1,778 | 59 | 43 | NA | NA | Road | Nonrural |
| Kenai Peninsula: | | | | | | | | | |
| Cooper Landing | 116 | 243 | 283 | 16 | 44 | 0 | 53 | Road | Rural |
| Hope | 103 | 161 | 135 | -16 | 41 | 38 | 50 | Road | Rural |
| Kenai | 4,324 | 6,327 | 7,058 | 12 | 48 | 12 | 38 | Road | Nonrural |
| Moose Pass | 76 | 81 | 134 | 65 | 43 | 25 | 25 | Road | Nonrural |
| Seward | 1,843 | 2,699 | 3,040 | 13 | 41 | 9 | 44 | Road/ferry | Nonrural |
| Soldotna[b] | 2,320 | 5,526 | 6,515 | 18 | 50 | 8 | 33 | Road | Nonrural |
| Sterling | 919 | 3,802 | 5,888 | 55 | 47 | 7 | 38 | Road | Nonrural |
| Prince William Sound: | | | | | | | | | |
| Chenega Bay[c] | 0 | 94 | 69 | -27 | 45 | 14 | 42 | Ferry | Rural |
| Cordova[d] | 1,879 | 2,110 | 2,571 | 22 | 46 | 3 | 23 | Ferry | Rural |
| Tatitlek | 68 | 119 | 110 | -8 | 53 | 0 | 75 | Ferry | Rural |
| Valdez | 3,079 | 4,068 | 4,155 | 2 | 45 | 8 | 26 | Road/ferry | Nonrural |
| Whittier | 198 | 243 | 288 | 19 | 43 | 8 | 37 | Train/ferry | Rural |

NA = not available.
[a] All of the communities have some form of aircraft access within 10 miles.
[b] Soldotna figures include Ridgeway.
[c] Chenega Bay was built in its present location in the mid-1980s owing to the destruction of the old village site in 1964.
[d] Cordova annexed Eyak in 1993.
Sources: Alaska Department of Labor, Research and Analysis 1999a; Alaska Department of Labor 1998; U.S. Department of Commerce, Bureau of the Census 1980, 1990; USDI Fish and Wildlife Service 1998.

holds for the municipality of Anchorage and the communities on the Kenai Peninsula. Seward, Hope, and Valdez, which are endpoints on highways, have slower population growth than the communities along highways. The communities in Prince William Sound also have increased in population, but not to the extent of those areas with highway access. Cordova's increase in population includes its annexation of the Native community of Eyak in 1993. Without the inclusion of Eyak, Cordova's population increased by 12 percent between 1990 and 1998.

The civilian labor force is defined as all people 16 years and older who are not members of the Armed Forces, and are either employed or unemployed but actively looking for work. People in the civilian labor force plus people in the Armed Forces together constitute the total labor force. Those not in the labor force are mainly students, homemakers, retired workers, seasonal workers who were not working and not looking for work at the time the census was taken, institutionalized persons, and persons doing only incidental unpaid family work. In some Alaska communities, this category also may include people who engage in a noncash-based subsistence lifestyle.

Some communities have fairly low civilian unemployment but a high percentage of the population (16 years and older) not in the labor force. Cooper Landing, Hope, Chenega Bay, and Tatitlek have high levels of civilian unemployment, or high levels of people not in the labor force, or both. These communities have seasonal industries and often few employment opportunities. Chenega

Bay and Tatitlek are small communities with little industry and whose remoteness isolates them from other communities and opportunities for commuting to other areas to work. Maintaining and creating local jobs in order to keep the younger population from leaving the area is often an issue of significant concern in these communities. Because the CNF surrounds these areas, future employment opportunities are likely to be impacted by future planning decisions affecting access and resource use.

Rural communities have access to subsistence resources and activities throughout the year and preference in times of shortage. The Federal Subsistence Board determines subsistence use and regulation for rural communities. Rural determination by the subsistence board is based on the following guidelines from the Federal Subsistence Management Program Operations Manual (USDI Fish and Wildlife Service 1998):

- Communities or areas with populations of 2,500 or fewer people are rural—unless they have significant characteristics of nonrural nature or are considered to be socially or economically part of an urbanized area.
- Communities or areas with populations over 7,000 people are nonrural—unless they have significant characteristics of a rural nature.
- Communities or areas with population above 2,500 but below 7,000 are evaluated on a case-by-case basis.
- The characteristics that the board considers include the use of fish and wildlife, the development and diversification of the economy, the community infrastructure, transportation, and educational institutions.
- Population figures come from the most recent federal census, updated by the Alaska Department of Labor.

The subsistence board last made rural and nonrural determinations in 1991. The current rural determinations will be reevaluated after the 2000 census, or as necessary. Currently, the board is completing a reevaluation of the communities on the Kenai Peninsula, including several communities in the study area.

**Age composition of communities—**The age distribution of a community's population can be reflective of many factors. People of different age groups select areas with characteristics that fit their needs and lifestyle. Older age groups are often concerned about access to shopping and health care, weather conditions, property taxes, housing availability and costs, and retirement benefits such as the Alaska longevity program. This program is state sponsored and includes six Alaska Pioneer Homes and a monthly check to seniors 65 and over. The Pioneer Homes provide residential, assisted living, and nursing care for seniors 65 and over who have resided in the state for at least one year. Families with young children may consider many of these attributes as well, but they may also be interested in schools, job opportunities, and community events and facilities.

Table 22 displays a breakdown of the population within age categories at the time of the 1990 census. The communities on the Kenai Peninsula show larger percentages of the population within the older age groups than those communities in Prince William Sound or Anchorage. The Alaska Native villages have some of the higher percentages of populations within the youngest age groups. Communities associated with forest-resource-related industries also tend to have younger populations.

**Racial composition of communities—**South-central Alaska does not have much racial diversity. Table 23 is a summary of each community's racial composition based on the 1990 census. The municipality of Anchorage is the most diverse and also has a racial composition most similar to that of the United States in 1990. According to state estimates, Anchorage's populations of African Americans and Asian-Pacific Islanders have increased slightly since the census (Alaska Department of Labor, Research and Analysis 1996). Chenega Bay and Tatitlek, both Native

**Table 22—Age composition of Chugach National Forest communities, 1990**

| Community | < 10 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70- and over |
|---|---|---|---|---|---|---|---|---|
| | | | | *Percentage of total population* | | | | |
| Municipality of Anchorage | 18.1 | 13.9 | 17.8 | 21.9 | 15.0 | 7.5 | 3.8 | 2.0 |
| Kenai Peninsula: | | | | | | | | |
| Cooper Landing | 15.9 | 14.8 | 4.4 | 16.2 | 7.7 | 19.6 | 13.7 | 7.7 |
| Hope | 8.9 | 12.7 | 5.7 | 30.4 | 9.5 | 5.7 | 22.8 | 4.4 |
| Kenai | 20.0 | 15.6 | 16.3 | 20.8 | 12.9 | 7.6 | 2.8 | 4.0 |
| Moose Pass | 16.3 | 20.4 | .0 | 28.6 | 34.7 | .0 | .0 | .0 |
| Seward | 14.3 | 11.0 | 19.8 | 22.4 | 16.0 | 6.9 | 6.0 | 3.7 |
| Soldotna | 19.1 | 17.3 | 14.0 | 19.4 | 14.4 | 8.0 | 2.3 | 5.6 |
| Sterling | 19.8 | 16.9 | 8.8 | 21.4 | 16.9 | 7.6 | 3.8 | 4.9 |
| Prince William Sound: | | | | | | | | |
| Chenega Bay | 12.8 | 25.5 | 24.5 | 18.1 | 10.6 | 5.3 | 3.2 | .0 |
| Cordova | 19.6 | 13.1 | 17.4 | 29.1 | 3.9 | 7.9 | 5.3 | 3.7 |
| Tatitlek | 27.0 | 27.0 | 12.6 | 23.4 | 4.5 | 4.5 | .9 | .0 |
| Valdez | 16.6 | 14.8 | 13.8 | 26.0 | 16.6 | 6.1 | 5.0 | 1.1 |
| Whittier | 13.9 | 17.1 | 13.9 | 20.0 | 19.2 | 6.9 | 6.5 | 2.4 |

Source: U.S. Department of Commerce, Bureau of the Census 1990.

**Table 23—Racial composition of Chugach National Forest communities, 1990**

| Community | Caucasian | American Indian, Eskimo and Aleut | African American | Asian-Pacific Island | Other ethnic |
|---|---|---|---|---|---|
| Municipality of Anchorage | 81 | 6 | 6 | 5 | 2 |
| Kenai Peninsula: | | | | | |
| Cooper Landing | 98 | 1 | 0 | 1 | 0 |
| Hope | 94 | 3 | 1 | 2 | 0 |
| Kenai | 89 | 8 | 1 | 2 | 1 |
| Moose Pass | 89 | 11 | 0 | 0 | 0 |
| Seward | 81 | 15 | 3 | 1 | 0 |
| Soldotna | 94 | 4 | 0 | 1 | 0 |
| Sterling | 97 | 2 | 0 | 1 | 0 |
| Prince William Sound: | | | | | |
| Chenega Bay | 31 | 69 | 0 | 0 | 0 |
| Cordova | 80 | 11 | 0 | 8 | 1 |
| Tatitlek | 13 | 86 | 0 | 0 | 0 |
| Valdez | 89 | 5 | 1 | 3 | 1 |
| Whittier | 81 | 12 | 2 | 5 | 1 |

Source: U.S. Department of Commerce, Bureau of the Census 1990.

**Table 24—Community housing characteristics, 1990**

| Community | Total households, 1990 | Persons per household, 1990 | Occupied housing, 1990 | Owner occupied, 1990 | Median value of house, 1990 | Median rent paid, 1990 | Houses without plumbing, 1990 |
|---|---|---|---|---|---|---|---|
| | | | *- - - - -Percent - - - - -* | | *- - - - 1990 dollars - - - -* | | *Percent* |
| Municipality of Anchorage | 82,702 | 2.68 | 88 | 53 | 109,700 | 528 | 0.4 |
| Kenai Peninsula: | | | | | | | |
| Cooper Landing | 101 | 2.41 | 36 | 77 | 105,800 | 263 | 37 |
| Hope | 72 | 2.24 | 44 | 58 | 55,000 | 242 | 74 |
| Kenai | 2,329 | 2.70 | 87 | 55 | 82,200 | 414 | .8 |
| Moose Pass | 33 | 2.45 | 65 | 55 | 87,500 | 392 | 23 |
| Seward | 886 | 2.47 | 88 | 47 | 92,400 | 434 | .9 |
| Soldotna | 1,284 | 2.69 | 88 | 58 | 82,600 | 430 | .5 |
| Sterling | 1,283 | 2.96 | 59 | 86 | 83,600 | 407 | 19 |
| Prince William Sound: | | | | | | | |
| Chenega Bay | 29 | 3.03 | 85 | 72 | 88,300 | 475 | 9 |
| Cordova | 773 | 2.61 | 88 | 55 | 109,400 | 448 | 2 |
| Tatitlek | 33 | 3.61 | 63 | 82 | 60,000 | 475 | 11 |
| Valdez | 1,277 | 2.90 | 85 | 66 | 109,000 | 589 | 2 |
| Whittier | 112 | 2.16 | 42 | 36 | NA | 372 | 4 |

NA = not available.
Source: Alaska Department of Labor and Workforce Development 1998, U.S. Department of Commerce, Bureau of the Census 1990.

communities, had significant Native populations in 1990 accounting for 69 and 86 percent of the population, respectively. Over the past decades, Alaska Native populations have shown only slight geographic redistribution throughout the state, so it is likely that these two communities have retained a race composition similar to the 1990 census (Alaska Department of Labor, Research and Analysis 1996). The 1990 populations of Cordova, Moose Pass, Seward, and Whittier were between 10 and 15 percent Alaska Native. Cordova, Whittier, Anchorage, and Valdez have the highest percentages of Asian-Pacific Islanders. The remaining communities within the Kenai Peninsula and the Prince William Sound areas had little or no 1990 population within the Native Alaskan, African American, Asian-Pacific Island or other ethnic race categories. The racial compositions of populations tend to change slowly, so it is unlikely that the communities have changed significantly since the 1990 census (Alaska Department of Labor, Research and Analysis 1996).

## Community Housing Characteristics

The differences and similarities between communities are often related to access, size, and culture. The variables presented in table 24 allow a comparison between community housing characteristics. Differences between housing variables can aid in comparing and contrasting communities as well as highlighting unique characteristics of individual communities that may attract and keep people in an area.

Persons per household is a measure of the average number of people living together—either as a family or other group—in the same residence. The communities with the largest number of people per household are the Native communities

of Tatitlek and Chenega Bay. The communities with the fewest number of people per household—Whittier, Hope, Cooper Landing, and Moose Pass—are communities associated with seasonal resource employment and activities, especially fishing, and seasonal homeowners.

Occupied housing is a measure of the number of structures in a community lived in at the time of the 1990 census. A low percentage of occupied homes can indicate a larger proportion of seasonal or second homes for retirees. Cooper Landing and Hope are examples with less than 50 percent of housing occupied. Communities that have a part of the community involved in seasonal work or subsistence activity, such as Tatitlek and Whittier, also had a low percentage of homes occupied at the time of the census. Communities with well-developed service and trade sectors and year-round employment opportunities have higher percentages of occupied housing. Anchorage, Cordova, Kenai-Soldotna, Seward, and Valdez all had over 80 percent of housing. Chenega Bay, although a small community with limited services and employment opportunities, also has a high percentage of housing occupied.

Owner-occupied housing measures the percentage of occupied homes in which the owner is living in the home at the time of the census. The Bureau of the Census considers housing occupied not occupied by the owner to be a rental. Cooper Landing had only 36 percent of occupied housing. Seventy-two percent of that housing was owner occupied. Therefore, very few people were renting homes in the community. The number of owners living in the community may be indicative of how much stake people have in the community and the level of commitment they have to staying in the area. Homeowners are generally interested in maintaining an adequate level of economic activity to provide jobs and income in the community. They also may be interested in changes in the amenities that led them to purchase a home in the community. The ability to buy a home also affects the percentage of owner-occupied housing. Whittier had over 60 percent renters because there is little property available for purchase. In Seward, the median price for a home is fairly high, so renting may be a more reasonable option for people even if they are committed to staying in the area.

## Community Employment

The 1990 census employment data are displayed in table 25. The sectors used in the census are not identical to those defined in the regional section of this assessment. Additionally, the census data are a measure of the people in each industry, not the number of jobs as defined in the regional section. Employment may be useful as an indicator of the economic structure of a community and for predicting how forest management might affect future economic conditions. This analysis of 1990 employment data has been supplemented with employment trend data for 1990-96 from the Alaska Department of Labor. Although these additional data do not include self-employed persons and, in some cases, are not available at the community level, they are useful in examining changes in employment trends.

Although some trends are common to most south-central Alaska communities, trends may impact each community differently. In south-central Alaska, the AFF sector is primarily composed of fish harvesters. Because most fish harvesters are considered to be self-employed, they are not included in Alaska Department of Labor statistics, but are included in the census figures in table 24. Employment within fish harvesting fluctuates greatly with the market demand, price, and condition of the various fisheries.

Seafood processing is another large industry in south-central Alaska. Employment in this industry is included in the manufacturing sector in table 24 along with the wood products industry. Employment in seafood processing also fluctuates in response to global fish markets. After the Tyson Seafoods[3] processing plant in Kodiak burned down in early 1996, employment increased in this sector in south-central Alaska (Mosher 1998). Communities with seafood-processing

[3] Use of firm or trade names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

**Table 25—Community employment by economic sector, 1990**

| Community | Agriculture, forestry, and fishing | Mining | Construction | Manufacturing | Communications, transport, utilities | Wholesale trade | Retail trade | FIRE[a] | Services | Public administration |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *Percentage of workforce* | | | | | |
| Municipality of Anchorage | 1 | 5 | 6 | 4 | 11 | 4 | 17 | 6 | 34 | 12 |
| Kenai Peninsula: | | | | | | | | | | |
| Cooper Landing | 28 | 0 | 14 | 0 | 0 | 0 | 10 | 0 | 35 | 13 |
| Hope | 0 | 0 | 11 | 15 | 0 | 11 | 34 | 0 | 28 | 0 |
| Kenai | 4 | 13 | 5 | 12 | 5 | 4 | 20 | 3 | 27 | 7 |
| Moose Pass | 26 | 0 | 0 | 0 | 0 | 0 | 74 | 0 | 0 | 0 |
| Seward | 9 | 2 | 4 | 12 | 9 | 3 | 18 | 3 | 28 | 12 |
| Soldotna | 2 | 7 | 5 | 5 | 4 | 3 | 24 | 4 | 37 | 9 |
| Sterling | 1 | 11 | 12 | 5 | 7 | 4 | 20 | 1 | 32 | 9 |
| Prince William Sound: | | | | | | | | | | |
| Chenega Bay | 56 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 25 | 11 |
| Cordova | 25 | 0 | 6 | 12 | 11 | 2 | 11 | 3 | 23 | 7 |
| Tatitlek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 53 |
| Valdez | 3 | 5 | 10 | 4 | 23 | 2 | 12 | 2 | 31 | 9 |
| Whittier | 11 | 3 | 10 | 2 | 26 | 0 | 8 | 7 | 21 | 11 |

[a] See table 2, footnote a.
Source: U.S. Department of Commerce, Bureau of the Census 1990.

plants include Anchorage, Cordova, Kenai-Soldotna, Seward, Valdez, and Whittier. Chenega Bay and Tatitlek are both involved in seafood harvesting and processing, including some oyster farming.

Mining includes oil and gas as well as hard rock mineral activities. In south-central Alaska, most employment within the mining sector is related to oil and gas and is concentrated in Kenai-Soldotna, Sterling, and Valdez, with Anchorage serving as headquarters for several related companies. Employment opportunities within this sector also fluctuate with markets and access to resources. Employment within the mining sector has declined within the municipality of Anchorage, Kenai, and Valdez since 1990. Sterling and Soldotna, however, have had increases in mining employment as resource exploration and development continues in the area.

Construction sector employment levels depend on community needs, federal, state, and local budgets for building infrastructure and repairing or upgrading existing structures. More recent trends highlight construction in Seward where several projects, including a dock, a prison, and the Sealife Center have led to continued employment opportunities in this sector. Kenai, Soldotna, and Sterling also have significant employment in construction owing to both population growth and the development of several service/retail structures since 1990.

As mentioned earlier, the manufacturing sector includes logging and sawmill operations. Similar to the fishing industry, many people employed as loggers or who have portable sawmills are self-employed and not counted in the state statistics but are included in the census data in table 24. Currently in south-central Alaska, there are a few small mills on the Kenai Peninsula employing a few people. The sawmill in Seward employed over 100 people in 1990 but closed in the mid-1990s when increases in export log prices made exporting raw logs more profitable than processing them. A sizable proportion of people in Tatitlek are employed in logging, with smaller percentages in Anchorage, Cordova, Kenai, Seward, Soldotna, Sterling, and Valdez. Logging employment can be transient. Communities with active timber harvesting will show a large amount of employment in logging while harvesting is occurring, but after the sale is over, employment shifts to the next sale area.

The wholesale trade, retail trade, financial-insurance-real estate and services sectors all have increased in absolute size, with retail trade and services increasing to a greater extent than the other sectors. This is a state as well as a national trend, arising from more people having more money to spend on goods and services. In south-central Alaska, the communities with highway access have shown the most growth since 1990 as these areas service more remote areas. Communities directly connected to tourism activities, such as Girdwood, Cooper Landing, Kenai-Soldotna, Sterling, and Seward have experienced more than a 100-percent increase in retail trade and services sector employment since 1990. Even communities with little or no employment in these sectors in 1990, such as Chenega Bay, Moose Pass, and Tatitlek have seen increases in employment in these sectors. These trends highlight not only an overall increase in visitors demanding services but also an effort on the part of communities to create a tourism industry.

People who are not necessarily attached to a single location for work, as well as retirees with outside incomes, are finding south-central Alaska communities attractive places to live and work. These people are creating employment opportunities in health and social services, as well as many other services.

Local education, which is included in the services sector in table 25, and the government sector are also important sources of employment in many of the south-central Alaska communities. In some of the smaller communities, such as Chenega Bay, Hope, Tatitlek, and Whittier, education offers one of the few permanent job opportunities in the community. Government employment is year round and tends to pay

**Table 26—Community employment diversity scores, 1990**

| Community | Number of industry sectors | Industry sectors in community | Normalized score |
|---|---|---|---|
| | | *Percent* | |
| Municipality of Anchorage | 17 | 100.0 | 0.926 |
| Kenai Peninsula: | | | |
| Cooper Landing | 6 | 35.3 | .604 |
| Hope | 5 | 29.4 | .530 |
| Kenai | 17 | 100.0 | .916 |
| Moose Pass | 2 | 11.8 | .203 |
| Seward | 17 | 100.0 | .913 |
| Soldotna | 17 | 100.0 | .889 |
| Sterling | 17 | 100.0 | .888 |
| Prince William Sound: | | | |
| Chenega Bay | 8 | 47.1 | .560 |
| Cordova | 17 | 100.0 | .872 |
| Tatitlek | 3 | 17.6 | .311 |
| Valdez | 17 | 100.0 | .898 |
| Whittier | 12 | 70.6 | .774 |

Source: U.S. Department of Commerce, Bureau of the Census 1990.

well—moderating some of the effects of seasonal and lower wage employment within a community. Overall, however, government employment is slowly declining as federal, state, and local budgets decline.

## Employment Diversity

The Shannon-Weaver (S-W) diversity index is a method of measuring how evenly a variable is distributed across the categories in which it is reported (Shannon and Weaver 1949). In this analysis, the S-W method is used to provide a measure of a community's employment diversity, similar to the regional analysis. The employment within an industry was measured relative to the total employment in the community. A community with employment in many different industries will have a higher S-W index score than a community with substantial concentrations of employment in a single industry. Whereas no community, even an extremely diverse one, will have a perfect distribution of employment—the S-W index is useful in comparing communities within the same area. Table 26 displays the normalized results of the community-level diversity analysis by using 1990 census data.

Analyzing the 1990 community population figures from table 21 together with the employment diversity scores in table 26 reveals that, for the CNF communities of interest, the two are closely correlated. The communities with the lowest employment diversity scores—Moose Pass, Tatitlek, Hope, and Chenega Bay—also had the smallest populations in 1990. Similarly, Anchorage and Kenai had both the highest diversity scores and the largest populations. Whittier, Seward, and Valdez had higher employment diversity scores than their population sizes would suggest, which may be due to their favorable locations for transportation-related economic activity.

## Community Income

The 1990 census income statistics for south-central Alaska communities are displayed in table 26. In those south-central Alaska communities with significant employment in fish harvesting, income can vary widely from year to year depending on conditions of the fisheries as well as market conditions. The census data were collected during a good year for the fisheries, so communities like Cordova, which had a large amount of fish harvesting employment, had a fairly high

median income. In general, the highest incomes in south-central Alaska were related to employment and activity within the oil, gas, and minerals industry. Sterling and Kenai on the Kenai Peninsula and Valdez in Prince William Sound had the highest median incomes in the study area. The level of activity in these industries is primarily determined by outside forces, with the management of CNF lands having little impact on activity levels.

The second column of table 27 shows the estimated percentage of individuals below poverty level (as defined by the Bureau of the Census) in 1990. Some of the individuals in this category are perhaps engaged in subsistence or other non-cash based activities. Communities containing a large percentage of individuals living below the poverty level who depend on subsistence activities are potentially more sensitive to forest plan changes.

## Community Education

In general, the state of Alaska has a higher level of educational attainment than the U.S. average. Table 28 summarizes the 1990 educational achievement of south-central Alaska communities. Within south-central Alaska, the municipality of Anchorage had the largest percentage of advanced degrees (graduate or professional) in 1990, with most other communities having at least 5 percent of their population holding advanced degrees. Moose Pass, Chenega Bay, and Tatitlek have the highest percentage of residents without high school diplomas. Tatitlek also has the lowest percentage of college degrees. This may indicate that there are lifestyle or cultural reasons for living in the area and that receiving an education that would prepare one for employment in a cash-based economy is not a high priority.

Table 29 displays the enrollment history of the south-central Alaska school districts. Although this is not a community-by-community record, it is an indicator of educational trends in the area. In general, enrollment numbers are increasing, following patterns similar to population growth. The largest increase is seen in correspondence enrollment. This is probably reflective of both a national trend of more parents home schooling their children, and more families in south-central Alaska moving to more remote areas without access to a school. Enrollment numbers are often important to communities as most state and federal financial support of educational programs is directly tied to these numbers. If communities lose families to industry layoffs, there is a chance that enrollment and funding will decline.

## Community Concerns

The communities of Anchorage, Kenai, Soldotna, and Sterling are fairly large and economically diverse; the resource industry activity associated with CNF outputs accounts for a small portion of the total economic activity in these areas. Thus, forest decisions will not likely affect their overall level of economic activity. However, the CNF does provide many social benefits to the residents of these communities, and many community members expressed concern about forest management decisions that may affect their quality of life or lifestyle.

Residents of Girdwood and Seward were concerned about both employment opportunities and access to forest resources. Many were interested in maintaining viable tourism industries without sacrificing resident recreation opportunities and other local forest uses. One of the largest concerns for the Whittier community was the completion of the road connecting Whittier to the Seward Highway. Many people believed that traffic to Whittier would increase dramatically. The other communities on Prince William Sound also were concerned about the increased usage of the sound this road might create.

Because of the spruce bark beetle infestation, many residents of the communities on the Kenai Peninsula were concerned about the possibility of large forest fires that may endanger structures or landscapes. Some residents of Hope were concerned about potential restrictions on mining activity, whereas others were concerned about the effects of mining activity on their natural surroundings. The Native communities of Chenega Bay and Tatitlek were concerned about protecting

**Table 27—Chugach National Forest 1990 income by community**

| Community | Median household income, 1990 | Individuals below poverty level | Income $0—10,000 | Income $11,000—20,000 | Income $21,000—30,000 | Income $31,000—$40,000 | Income $41,000—50,000 | Income $51,000 – 60,000 | Income $61,000—$75,000 | Income $75,000—100,000 | Income $101,000 and above |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Dollars* | *Percent* | *Percentage of households in 1990* | | | | | | | | |
| Municipality of Anchorage | 43,946 | 7 | 5 | 10 | 12 | 12 | 12 | 10 | 14 | 15 | 11 |
| Kenai Peninsula: | | | | | | | | | | | |
| Cooper Landing | 42,250 | 3 | 0 | 0 | 14 | 0 | 14 | 0 | 34 | 0 | 39 |
| Hope | 17,250 | 33 | 0 | 30 | 23 | 23 | 0 | 0 | 0 | 0 | 23 |
| Kenai | 42,889 | 7 | 6 | 9 | 11 | 12 | 13 | 13 | 14 | 13 | 10 |
| Moose Pass | 22,083 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Seward | 37,049 | 10 | 7 | 11 | 11 | 13 | 12 | 10 | 11 | 14 | 11 |
| Soldotna | 38,004 | 5 | 4 | 13 | 12 | 14 | 12 | 9 | 19 | 13 | 4 |
| Sterling | 51,145 | 7 | 6 | 7 | 11 | 9 | 13 | 12 | 20 | 15 | 7 |
| Prince William Sound: | | | | | | | | | | | |
| Chenega Bay | 22,083 | 26 | 6 | 25 | 19 | 0 | 13 | 25 | 0 | 13 | 0 |
| Cordova | 46,304 | 4 | 5 | 10 | 13 | 8 | 14 | 10 | 15 | 13 | 14 |
| Tatitlek | 27,188 | 19 | 26 | 11 | 15 | 0 | 4 | 22 | 11 | 11 | 0 |
| Valdez | 68,570 | 5 | 3 | 5 | 4 | 8 | 9 | 12 | 12 | 24 | 22 |
| Whittier | 33,636 | 13 | 5 | 12 | 21 | 9 | 9 | 23 | 9 | 7 | 5 |

Source: U.S. Department of Commerce, Bureau of the Census 1990.

**Table 28—Community educational achievement, 1990 census**

| Community | Less than 9th grade | High school (no diploma) | High school (diploma) | Some college (no diploma) | Associate degree | Bachelor degree | Graduate or professional degree |
|---|---|---|---|---|---|---|---|
| | | | *Percentage of residents 25 years and older* | | | | |
| Municipality of Anchorage | 2.8 | 6.8 | 25.8 | 29.8 | 8.4 | 17.3 | 9.5 |
| Kenai Peninsula: | | | | | | | |
| Cooper Landing | 7.4 | 0 | 43.6 | 10.6 | 0 | 31.4 | 6.9 |
| Hope | 0 | 7.3 | 28.2 | 45.2 | 6.5 | 7.3 | 5.6 |
| Kenai | 3.0 | 9.0 | 37.0 | 29.0 | 7.0 | 10.0 | 5.0 |
| Moose Pass | 25.8 | 0 | 29.0 | 0 | 0 | 45.2 | 0 |
| Seward | 3.0 | 8.7 | 38.6 | 28.3 | 6.1 | 10.0 | 5.4 |
| Soldotna | 3.0 | 8.0 | 49.0 | 4.0 | 10.0 | 19.0 | 7.0 |
| Sterling | 3.0 | 9.0 | 31.0 | 25.0 | 12.0 | 14.0 | 6.0 |
| Prince William Sound: | | | | | | | |
| Chenega Bay | 31.7 | 9.8 | 24.4 | 14.6 | 0 | 14.6 | 4.9 |
| Cordova | 5.4 | 9.3 | 34.1 | 25.6 | 8.2 | 12.5 | 5.0 |
| Tatitlek | 13.6 | 18.2 | 43.2 | 15.9 | 0 | 9.1 | 0 |
| Valdez | 4.5 | 10.7 | 30.1 | 28.2 | 8.3 | 13.4 | 4.8 |
| Whittier | 2.8 | 17.2 | 39.3 | 26.2 | 4.1 | 4.8 | 5.5 |

Source: U.S. Department of Commerce, Bureau of the Census 1990.

and maintaining subsistence resources and access to these resources. Protection of cultural and historic resources is also important to these communities.

## Individual Community Descriptions

The following section includes brief descriptions of individual communities—including aspects of their history, population, economic structure, housing characteristics, and community infrastructure. Recognizing that the CNF is a national resource and is valued by people residing outside of south-central Alaska, it remains important for decisionmakers to be informed about the conditions of the communities in or near the forest as forest management decisions can have social and economic impacts on these communities. Most of the information presented here is taken from Alaska Department of Labor Community Information Summaries (1998).

**Municipality of Anchorage—**Located at the head of Cook Inlet, the municipality of Anchorage is Alaska's largest city. With a population of 258,782 (Alaska Department of Labor, Research and Analysis 1999a), Anchorage dominates any regional-scale, aggregate assessment of economic and social characteristics of the 14 communities most directly affected by CNF activity. The municipality of Anchorage (which includes the community of Girdwood, population 1,778, to the south) accounts for nearly 95 percent of the total population of communities within or adjacent to the CNF. Anchorage is accessible by highway, railroad, commercial or chartered aircraft, and ocean-going cruise ships. The Supervisor's Office of the CNF is located in Anchorage, and the Glacier Ranger District headquarters is in Girdwood. The headquarters of Chugach Alaska Native Corporation is also in Anchorage.

**Table 29—South-Central Alaska school enrollment, 1986-99**

| School | 1986-87 | 1987-88 | 1988-89 | 1989-90 | 1990-91 | 1991-92 | 1992-93 | 1993-94 | 1994-95 | 1995-96 | 1996-97 | 1997-98 | 1998-99 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Anchorage District | 39,785 | 37,356 | 40,007 | 40,924 | 41,992 | 44,406 | 45,870 | 46,883 | 47,205 | 47,318 | 48,109 | 48,888 | 49,587 |
| Chugach District: | | | | | | | | | | | | | |
| Chenega Bay | 19 | 13 | 18 | 27 | 21 | 19 | 22 | 26 | 13 | 16 | 14 | 8 | 14 |
| Chugach extension correspondence | 16 | | | 8 | 25 | 28 | 26 | 17 | 19 | 35 | 62 | 79 | 89 |
| Tatitlek | 31 | 24 | 17 | 23 | 18 | 24 | 28 | 32 | 31 | 30 | 29 | 31 | 28 |
| Whittier | 52 | 53 | 41 | 49 | 43 | 44 | 38 | 37 | 39 | 49 | 34 | 42 | 38 |
| Cordova city schools | 435 | 443 | 433 | 441 | 424 | 474 | 481 | 498 | 511 | 527 | 535 | 505 | 485 |
| Kenai Peninsula | | | | | | | | | | | | | |
| Borough schools: | | | | | | | | | | | | | |
| Cooper Landing | 24 | 14 | 15 | 24 | 30 | 41 | 47 | 49 | 43 | 40 | 37 | 36 | 35 |
| Hope | 18 | 19 | 23 | 23 | 26 | 30 | 32 | 31 | 44 | 35 | 32 | 20 | 24 |
| Kenai | 1,463 | 1,221 | 884 | 839 | 855 | 1,011 | 1,012 | 1,716 | 1,803 | 1,785 | 1,794 | 1,780 | 1,815 |
| Moose Pass | 21 | 18 | 22 | 28 | 27 | 42 | 31 | 34 | 32 | 39 | 39 | 37 | 34 |
| Seward | 554 | 544 | 588 | 668 | 764 | 797 | 806 | 848 | 879 | 896 | 880 | 854 | 876 |
| Soldotna | 1,229 | 1,735 | 1,814 | 1,850 | 1,502 | 1,458 | 1,470 | 2,939 | 3,075 | 3,106 | 3,216 | 3,241 | 3,226 |
| Sterling | 378 | 254 | 264 | 279 | 292 | 306 | 322 | 351 | 369 | 384 | 355 | 334 | 314 |
| Valdez city schools | 761 | 757 | 755 | 829 | 816 | 905 | 959 | 896 | 911 | 903 | 888 | 890 | 852 |
| Total | 44,786 | 42,451 | 44,881 | 46,012 | 46,835 | 49,585 | 51,144 | 54,357 | 54,974 | 55,163 | 56,024 | 56,745 | 57,417 |

Enrollment is taken on October 1 of each school year.
Source: Alaska Department of Education and Early Development 1999.

The municipality of Anchorage is the largest and most economically diverse community of those surrounding the CNF. It is a major international hub for commercial air traffic, connecting much of the lower 48 states and Canada with northern Pacific Rim nations such as Japan, Korea, China, and the Russian Far East. Anchorage is the regional center for many state and national enterprises.

Girdwood is a small community included within the municipality of Anchorage but, in some aspects, is not directly tied to the larger economic area of Anchorage. Girdwood's economic activity is centered on tourism. Girdwood is home to the Alyeska Ski Resort and the four-star Princess Hotel as well as several sightseeing and flightseeing operations. Services and retail business make up a large portion of the economic activity.

In 1990, Anchorage had 94,153 total housing units; 11,451 were vacant. The municipality of Anchorage has the infrastructure of a metropolitan city, including municipal water and sewer systems and a municipal landfill, natural gas, electricity, hospitals and health clinics, city bus service, universities, national retail chain stores, fast-food franchises, and entertainment venues.

**Chenega Bay—**Chenega Bay, a small, unincorporated Alaskan Native village of 69 residents (Alaska Department of Labor, Research and Analysis 1999a) is primarily a fishing and subsistence community. Chenega Bay is located on Evans Island, about 40 miles southeast of Whittier in the Prince William Sound. It is accessible by chartered aircraft, boat, and the state ferry. The village was reestablished in the mid-1980s at its present location after tsunamis from the 1964 earthquake destroyed the original village. The *Exxon Valdez* oil spill had significant economic, social, and psychological impacts on members of this community. See Picou and Gill (1996), Picou and others (1999), and Davidson (1990) as well as the many references cited therein for assessments of the scope and magnitude of these impacts.

Chenega Bay's economic activity includes fishing, oyster farming, education, and subsistence activities. The community has a small boat harbor and dock. There is both a floatplane landing area and a new gravel airstrip. Services are limited, but both retail and service sector employment has increased since 1990.

Chenega Bay has a majority of owner-occupied housing, with an average household size of about three people. In 1990, 47 percent of Chenega Bay residents 5 years or older had lived in the same dwelling for the past 5 years. The community has a health clinic, electricity, plumbing, garbage collection services, television, and telephone service. Over 80 percent of the homes are completely plumbed with sewage piped to a community septic tank. The rest of the homes have individual septic tanks or outhouses. The community is currently raising funds for an incinerator. Electricity is provided by the Chenega Bay Village Council utilities through the diesel power plant.

**Cooper Landing—**Cooper Landing is a small, unincorporated community located along the northwestern shore of Kenai Lake, about 30 miles northwest of Seward on the Sterling Highway. Its population of 283 (Alaska Department of Labor, Research and Analysis 1999a) grows substantially during summer with the influx of summer homeowners, tourists, and visitors who come to fish the summer runs of the Kenai and Russian Rivers and enjoy the Kenai Mountains. Cooper Landing is a subsistence community accessible by the Sterling Highway and chartered aircraft.

The major industrial sectors of Cooper Landing's economy in 1990 were forestry, fishing, and services. Both the opening of the Kenai Princess Lodge and an increase in the number of visitors driving through on the highway have led to increased employment in the service and retail trade sectors. Commercial fishing and guided sport fishing tours have offered additional employment opportunities since 1990. There is still some employment in forestry and oil and gas production and processing.

Only 36 percent of all Cooper Landing housing units were occupied in 1990, with 77 percent occupied by owners. The average household size was 2.4 people. In 1990, 79 percent of Cooper Landing residents (5 years or older) had lived in the same dwelling for the past 5 years. The community has electricity, television, and telephone service. Over 65 percent of the homes are completely plumbed with individual wells and septic tank systems. The rest of the homes haul water and use outhouses, many are seasonal homes. The community does not have a health clinic but does have a rescue service. Both Soldotna and Seward are accessible for health care needs.

**Cordova**—Cordova is located 150 air miles southeast of Anchorage in Orca Inlet at the southeastern end of Prince William Sound. Cordova began as a fishing community in the late 1880s. The town experienced significant growth in the early 1890s as the railroad terminus and shipping center for the Kennicott Copper Mine. Presently, Cordova has a population of 2,571 residents (Alaska Department of Labor, Research and Analysis 1999a) and is primarily a fishing community. Subsistence is an important part of the Cordova lifestyle. Although the community has a majority of nonnatives, the Alaska Native village of Eyak was incorporated into Cordova's boundaries in 1993. The Eyak village council represents the views and concerns of Alaska Natives in the larger community. No roads link Cordova to other communities and access is by commercial airline, boat, and state ferry. Cordova is the headquarters for the CNF Cordova Ranger District. The *Exxon Valdez* oil spill also had significant economic, social, and psychological impacts on members of this community. For details, see references cited for Chenega Bay.

The major industrial sector in Cordova was historically fishing and seafood processing. In the past, over 50 percent of the community's employment was directly related to commercial fish harvesting and seafood processing. Today, the community is more diverse, although commercial fishing and processing still plays a major role. Although the salmon supply has not changed, the continued downturn of the Asian market has decreased the demand for it, thus causing a decrease in prices. Government activity, although it has declined over the past few years, is the second most important industry. The wood products industry was also a significant sector in Cordova's economic structure until the Eyak sawmill closed. Recently, there has been a surge of timber harvesting on Eyak corporation lands, which may revitalize the wood products sector. Services, retail trade, and transportation have increased in importance as Cordova's tourism industry develops. Cordova's character and economic structure may change if the Copper River Highway is extended to Chitina, opening the area to highway access. There is also discussion of a deep-water port permitting cruise ships to dock in Cordova.

In 1990, 88 percent of all Cordova households were occupied, with 49 percent occupied by owners. The average household size was 2.6 people. Forty percent of Cordova residents 5 years and older had lived in the same dwelling for the past 5 years. Cordova has year-round barge services, but state ferry service only in summer. There are daily scheduled jet flights and air taxies from the airport. In support of the fishing fleet, there is a boat harbor and marine repair services. A city water and sewage system connects over 90 percent of homes in the community. Electricity is supplied through two diesel power plants and a hydroelectric facility. Community services include a hospital, health clinic, volunteer fire department, and emergency medical services.

**Hope**—Hope is a small, unincorporated community of 135 residents (Alaska Department of Labor, Research and Analysis 1999a) located along the southern shore of Turnagain Arm near the mouth of Resurrection Creek. Most of the residents are non-Natives. Hope began as a mining camp and some mining still occurs. There are many seasonal homeowners in the area. Hope is accessible by highway and chartered aircraft.

Hope has limited economic opportunities for its residents. The community school and retail businesses provide most of the employment.

The community has a small, seasonal sawmill that provides lumber mainly for local projects. Similarly, the amount of construction employment varies with projects in the area and does not usually offer year-round employment. Increases in visitors and seasonal homes have provided some growth to the area in the retail trade, transportation, and service sectors.

In 1990, 44 percent of all Hope housing units were occupied, with 58 percent occupied by owners. The average household size was 2.2 people. Forty-six percent of Hope residents 5 years and older had lived in the same dwelling for the past 5 years. Hope has two community associations, indicating there is a high level of organization from people concerned about their area. Only 25 percent of the homes in Hope are fully plumbed. Many of those without plumbing are seasonal homes. Electricity is provided through a hydro power plant. The community of Hope does not have a health clinic, but there is an emergency medical service available.

**Kenai—**Kenai is located 155 miles southwest of Anchorage on the northwest coast of the Kenai Peninsula at the mouth of the Kenai River. It was founded as a Russian fur trading post in 1791. In 1869, the U.S. military established a post, which was abandoned in 1870 after Alaska was purchased from the Russians. By the 1920s, commercial fishing was the primary activity. In 1957, oil was discovered—the first major Alaska oil strike, and Kenai began growing as a center for oil exploration and production. Kenai has a population of 7,058 (Alaska Department of Labor, Research and Analysis 1999a). The population is mostly non-Native.

Oil and gas exploration and production still play a major role in Kenai's economic activity. The city is the entrance point for services and supplies for oil drilling and exploration in Cook Inlet. Several oil and natural gas deposits have been discovered in the area since 1991. Although the area has diversified since the oil market crash in the mid-1980s, the community is still influenced by oil markets. Commercial fish harvesting and processing, as well as sport fishing, have become important economic activities. The Kenai River is a major fishing location for residents and tourists as trophy king (*Oncorhynchus tshawytscha*) and silver (*Oncorhynchus kisutch*) salmon attract tourists to the area. The larger tourism industry also has created opportunities for growth within the transportation, construction, retail trade, and services sectors.

In 1990, 87 percent of all Kenai households were occupied, with 54 percent occupied by owners. The average household size was 2.7 people. Thirty-nine percent of Kenai residents 5 years or older had lived in the same dwelling for the past 5 years. Kenai has a municipal water and sewer system. Natural gas and electricity are available. There is an emergency medical service in the community, and health care facilities are available at a hospital in Soldotna.

**Moose Pass—**Moose Pass is a small, unincorporated community located 26 miles north of Seward along the Seward Highway. Moose Pass is home to 134 residents (Alaska Department of Labor, Research and Analysis 1999a) with the population increasing during summer as seasonal homeowners return to the area. The community is primarily non-Native. First named as a station on the Alaska Railroad, the rail and highway accessibility continues to generate commerce for Moose Pass businesses.

The major sectors in Moose Pass are retail trade, services, forestry (logging), and government. The Alaska State Division of forestry, local businesses, and the school provide most of the year-round employment.

In 1990, 65 percent of all Moose Pass housing units were occupied, with 55 percent occupied by owners. The average household size was 2.5 people. In 1990, 71 percent of Moose Pass residents 5 years and older had lived in the same dwelling for the past 5 years. Moose Pass has electricity but no community water or sewer system. A majority of homes use individual water wells and septic tank systems, and over 50 percent are fully plumbed. The community does have an emergency medical service but no health clinic or hospital.

**Seward—**Seward is located on Resurrection Bay at the end of the Seward Highway, 128 miles south of Anchorage. The community serves as the Gateway to the Kenai Fjords National Park as well as the ocean terminus of the Alaska Railroad. Seward has a total population of 3,040 (Alaska Department of Labor, Research and Analysis 1999a), with a significant Alaska Native community. Seward is accessible by highway, railroad, state ferry, and chartered air service. The community is the headquarters for the CNF Seward Ranger District. The annual Mount Marathon race over the 4th of July weekend attracts people from Alaska and beyond to compete.

Seward is economically diverse although most economic activity is related to the community's location and accessibility. As an ice-free seaport serving Anchorage and interior Alaska by both railway and highway, Seward serves as a transportation center for both cargo and people. Because of the deep port facilities, there is significant cargo-ship traffic, ship repair services, tourism activity, and other services activity. Seward is the major cruise ship entrance point and ferry stop for visitors to south-central Alaska. The area also has a fish processing plant, a coal export facility, state prison, part of the University of Alaska's marine sciences facilities, and the newly opened Sealife Center. Economic activity associated with these facilities has generated additional employment in the transportation, retail trade, and services sectors.

In 1990, 88 percent of all Seward housing units were occupied, with 30 percent occupied by owners. The average household size was 2.5 people. In 1990, 31 percent of Seward residents 5 years or older had lived in the same dwelling for the past 5 years. Electricity and natural gas are available in the community. There is a city water and sewer system. Almost all homes are fully plumbed. The community has a hospital, health clinic, and an emergency medical service.

**Soldotna—**Soldotna is located on the Kenai Peninsula, 150 miles south of Anchorage on the Seward Highway. The population of 6,515 (Alaska Department of Labor, Research and Analysis 1999a) is primarily composed of non-Native, year-round residents. The Kenai-Soldotna area serves as a hub for both residents of the Kenai Peninsula and visitors to the area. The airport provides daily shuttle flights to and from Anchorage.

Oil and gas exploration and production play a major role in the area's economy. Although the area has diversified since the oil market crash in the mid-1980s, the community is still influenced by oil markets. New deposit discoveries and exploration have increased employment in the mining sector. The openings of national retail chain stores and restaurant franchises also have created employment opportunities in the trade, services, and construction sectors. As the Kenai-Soldotna area continues to develop as a regional hub for smaller communities on the peninsula, further growth and diversification is expected. The tourism industry also has created opportunities for growth within the transportation, construction, retail trade, and services sectors. The Kenai Convention and Visitors Bureau reported 800 visitors a day in July 1993—and that number has probably increased each summer thereafter.

In 1990, 88 percent of all Soldotna housing units were occupied, with 58 percent occupied by owners. The average household size was 2.7 people. In 1990, 42 percent of Soldotna residents 5 years or older had lived in the same dwelling for the past 5 years. Natural gas is available and electricity is provided through a hydro and natural gas power plant. All homes are completely plumbed, and there are city water and sewer systems. There is also city refuse collection. There are several health clinics and hospitals in the area.

**Sterling—**Sterling is located 18 miles east of Kenai on the Sterling Highway, at the junction of the Moose and Kenai Rivers. The community is unincorporated and currently has a population of 5,888 (Alaska Department of Labor, Research and Analysis 1999a), mostly non-Native and year-round residents. Sterling is accessible by chartered aircraft and highway. The community was originally a supply center for oil and mining

exploration in the area. Today, it caters to the sport fishing industry and summer recreational enthusiasts.

Economic activity in Sterling is similar to, if not connected to, the activity in Kenai-Soldotna. Much of the employment is related to oil and gas exploration and production, so oil markets affect the level of employment. Tourism also plays a large role in the community with visitors coming from all over the world to fish in the area. Tourism generates employment in the retail trade, services, construction, and transportation sectors. There is some logging employment in the community, which is mostly attributable to timber harvests from local private lands.

In 1990, 59 percent of all Sterling housing units were occupied, with 86 percent occupied by owners. The average household size was 3.0 people. In 1990, 55 percent of Sterling residents 5 years or older had lived in the same dwelling for the past 5 years. Natural gas is available, and electricity is provided through a hydro and natural gas power plant. The area does not have community water or sewer systems. About 80 percent of the homes in Sterling are completely plumbed. Many homes in the community are used only seasonally. There is an Emergency Medical Service available, and health clinics and hospitals are available in Kenai-Soldotna.

**Tatitlek—**Tatitlek is a small, unincorporated Alaskan Native village of 110 residents (Alaska Department of Labor, Research and Analysis 1999a). The community is located on the northwest shore of Tatitlek Narrows on the Alaska mainland in Prince William Sound, 30 miles southwest of Valdez. Tatitlek is primarily a fishing and subsistence community with access by chartered aircraft, boat, and state ferry. The sale or importation of alcohol is banned within the community. Without highway access, boats are the primary source of local transportation. The community recently completed construction of a breakwater and boat harbor. The *Exxon Valdez* oil spill also had significant economic, social, and psychological impacts on members of this community. For details, see references cited for Chenega Bay.

Tatitlek has a fishing and subsistence-based culture, and the community does not operate completely on a cash-based economic system. There are a few service and retail businesses and a school that offer year-round employment opportunities. Local fish processing and oyster farming also provide some employment.

In 1990, 64 percent of all Tatitlek households were occupied, with 82 percent occupied by owners. The average household size was 3.6 people. In 1990, 63 percent of Tatitlek residents 5 years and older had lived in the same dwelling for the past 5 years. Electricity is available through a diesel power plant. A dam provides piped water and sewer system services for 34 homes. About 80 percent of the homes are fully plumbed. The community has a local landfill, but there is no garbage collection. In 1998, the village received funds for water and solid waste improvements. There is a health clinic in the community.

**Valdez—**Valdez is located 120 air miles east of Anchorage in Prince William Sound. It is 305 highway miles from Anchorage via the Richardson and Glenn Highways and serves as the southern terminus for the Trans Alaska Pipeline, which was completed in the 1970s. The oil industry is responsible for the high municipal tax base in the community. The community is incorporated with a primarily non-Native population of 4,155 residents (Alaska Department of Labor, Research and Analysis 1999a). Valdez began as a point of entrance to the Klondike gold fields. The original city was destroyed in the 1964 earthquake and rebuilt in its present location. Valdez is accessible by highway, commercial airline, and state ferry. Cruise ships also dock at Valdez during the summer. The *Exxon Valdez* oil spill also had significant economic, social, and psychological impacts on members of this community. For details, see references cited for Chenega Bay.

Valdez has the largest concrete dock in the world, and is the endpoint of the Richardson Highway and the Trans Alaska Pipeline. Much of Valdez's economic activity is derivative of the transportation of resources and people. Transportation,

construction, and seafood processing are all large sectors in the area. Retail trade and services also have become important sectors as both resident population and total visitors to the area have increased.

In 1990, 85 percent of all Valdez households were occupied, with 43 percent occupied by owners. The average household size was 2.9 people. In 1990, 43 percent of the residents 5 years or older had lived in the same dwelling for the past 5 years. Electricity is provided through a hydro power plant with diesel backup. The city provides piped water and sewer systems. About 95 percent of all homes are fully plumbed. The city also operates a local landfill and collects refuse. In 1998, an oil and hazardous waste recycling center was completed. The community has a hospital, health clinic, and other health and social services.

**Whittier—**Whittier is located on the northeast shore of the Kenai Peninsula, at the head of Passage Canal. On the west side of Prince William Sound, Whittier is only 50 miles southeast of Anchorage, but has limited access via the Alaskan Railroad, charter aircraft, and state ferry. Whittier began as an ice-free port and railroad terminus established during World War II. Commercial cruise ships also dock at Whittier during the summer. Whittier is an incorporated and primarily non-Native community, with a population of 306 (Alaska Department of Labor, Research and Analysis 1999a). It is now a major point of entry for barge shipping of goods and fuel for Anchorage and interior Alaska.

The major industrial sectors in Whittier are transportation and fishing. Most of the transportation is associated with moving visitors to and from Prince William Sound. When the road to Whittier is finished, there may be a greater impact on the community as even more visitors use it as a gateway to Prince William Sound. Many Whittier residents participate in a subsistence lifestyle rather than in the cash-based economy. With completion of the road, the community may be reclassified as urban based on the improved access.

In 1990, 42 percent of all Whittier housing units were occupied, with 35 percent occupied by owners. Nearly all of the housing units are located within a single high-rise building (The Begich Towers). The average household size was 2.2 people. In 1990, 25 percent of Whittier residents 5 years and older had lived in the same dwelling for the past 5 years. A hydropower plant provides electricity. There are public water and sewer systems. About 95 percent of the homes are fully plumbed. The community has refuse collection but there is no landfill. Whittier has a health clinic and a Volunteer Ambulance Corps.

## Community Social and Economic Conditions Summary

This section has provided a closer look at the social and economic conditions of the individual communities in or near the CNF. This examination revealed both the differences that exist between communities as well as some similarities between groups of communities. For example, although no two communities have identical demographic or economic characteristics, the largest communities had the highest employment diversity scores, whereas the smallest communities had the lowest employment diversity scores. The communities of Hope, Chenega Bay, and Tatitlek had the largest percentages of individuals below poverty level as well as high percentages of people who were either unemployed or not in the labor force. These communities have subsistence preference, thus their lower level of labor force participation and lower median incomes may reflect higher levels of subsistence activities. Chenega Bay and Tatitlek are also Native communities. Forest management actions located near these communities are likely to have a greater economic and social impact on them than on communities that have larger populations, more diverse economies, and higher income levels. The community likely to experience the most change in the next few years is Whittier because of the new road. Other communities also are concerned about impacts from the increased number of visitors to Prince William Sound that may accompany this new road.

As discussed in Section 2, the CNF-related resources that play the largest role in the economic structure of many of the smaller communities are those associated with the recreation and tourism industry. Although most of the larger communities would probably not experience significant changes in their overall level of economic activity from CNF management changes, they could experience indirect economic and social effects through changes that impact their quality of life such as changes in recreation opportunities. As yet, community views about specific forest management issues and the role of the CNF in the quality of life of community residents are not addressed. In the next section we provide a more thorough investigation of these issues as well as an examination of residents' perceptions of their communities.

## Section 4: Community Surveys

Under the provisions of the 1969 National Environmental Policy Act and the 1976 National Forest Management Act, the public's opinions and concerns about forest planning are discovered through the scoping process. Scoping traditionally involves the solicitation of public comments through community meetings and written letters or documents filed with the Forest Service. One of the chief limitations of this approach is that it is not possible to extrapolate the relative proportion of comments received to the true proportion among the population because scoping is not a true sampling technique. That is, simply because two-thirds of the comments received are positive, it is a mistake to infer that two-thirds of the general population are also positive. Conducting probability samples[4] of the general population can reduce this problem.

In early 1998, Alaska Pacific University (APU) and CNF cooperatively conducted a social survey of residents of 15 communities neighboring the CNF. The purpose of the survey, entitled "Planning for the Future of the Chugach National Forest," was to get a better understanding of resident's attitudes regarding the role of the public in forest plan revision, specific forest management and allocation issues, general forest uses, and ecosystem values of the CNF. Few, if any, surveys were returned from the Alaska Native communities of Chenega Bay, Eyak, and Tatitlek and therefore are not reported. One of the challenges for CNF planners and decisionmakers is to identify ways to reach these communities so that their input is effectively incorporated.

More than 2,300 households from the 12 communities were surveyed. Households were randomly selected from a sampling frame of all community households with at least one household member in the 1998 Alaska permanent fund dividend (PFD) database. This database contains the names and addresses of an estimated 90 percent of Alaska residents. The PFD database underrepresents residents who have lived in Alaska less than 2 years. Thus, newcomers to Alaska are excluded from the sample. In addition to the 12 community samples, an Alaska statewide sample was selected from all households in other Alaska communities with at least one household member in the 1998 PFD database. The overall response rate from the 12 communities was about 32 percent, ranging from a high of 44 percent for Cooper Landing and Moose Pass to a low of 23 percent for Whittier.

In April 1999, APU conducted another survey of Alaskan communities. This survey, entitled "Your Community's Quality of Life," focused on residents' attitudes about the importance of, and satisfaction with various social, economic, and environmental attributes of their community; preferences for growth in various economic sectors; and evaluations of selected community characteristics. This survey was mailed to about 2,800 households in 17 communities in south-central and southeast Alaska. Only the findings for the CNF communities of interest are reported here. These households were randomly selected from the 1999 PFD database in the same manner as that described for the previous survey. Once

[4] Probability sampling methods are procedures where some mechanism involving chance is used to determine the sample members and the probability of any particular sample being drawn is known (Newbold 1991).

again, there were few, if any, surveys returned from the Alaska Native communities of Chenega Bay, Eyak, and Tatitlek and, therefore, they are not reported. The overall response rate from the 12 communities was about 24 percent, ranging from a high of 34 percent for Cooper Landing to a low of 18 percent for Whittier.

The low survey response rates introduce the potential for nonresponse bias. One way to account for nonresponse bias is to assess the representativeness of respondents by comparing their characteristics with community characteristics from census data. Unfortunately, because the census data available for the individual communities were almost 10 years old, most of the census data were based on a sampling frame of all individuals rather than all PFD households. Additionally, the measurement scales for socioeconomic characteristics in the census data differed from those used in the APU surveys; therefore, such comparisons are not meaningful in this case. Because of the possibility of nonresponse bias, however, APU researchers conducted followup phone interviews and did not uncover any systematic bias (Brown 2001).

Because the main objective of these two surveys was more to learn about the individual communities rather than to derive a single forest-wide perspective, the sampling plans for both surveys were prepared as individual random samples from each community. They were not stratified or weighted by community population when arriving at forest-wide summary statistics. If community results were weighted by their populations, the forest-wide results would have been strongly biased toward the attitudes of Anchorage residents as its population accounts for about 90 percent of the 12-community total population.

Our intent here is to summarize the results as concisely as possible without compromising the information derived from the surveys. In our presentation of the survey results, we do not carry out tests for statistically significant differences in responses to individual questions within a community or between communities. Although such tests might interest readers, the enormous number of tests required outweighs their value for our purpose. For example, for one question, there are 1,482 possible pairwise tests between communities. For most questions, however, we do report 95 percent confidence intervals for the results from each community except in cases where table clutter would be excessive. Where not reported, these confidence interval estimates are available from the authors. In general, in communities where the response rates were the lowest, the confidence intervals around the estimates are widest. We emphasize, that our purpose here is not to provide a rigorous statistical analysis of the survey results. Rather, the survey estimates are offered as an additional source of information useful in understanding community residents' interests, values, and perceptions. Again, although response rates for the surveys were less than optimal, the estimates represent the best indicators we have of how residents of each community feel about the surveyed topics. We turn now to these topics and results, beginning with the first survey.[5]

## "Planning for the Future of the Chugach National Forest" Survey: The Public's Role in Forest Plan Revision

General interest in public land planning and management appears to be increasing throughout the country. The APU survey asked community residents two questions about their involvement in revising the forest plan. The first question concerned whether the respondent was interested in what happens to the CNF in the next 10 to 15 years. Results from this question are displayed in table 30. Forest wide, a clear majority of the respondents from the 12 CNF communities of interest (80 percent) indicated that they are very interested in what happens to the CNF during the next 10 to 15 years (the 2000 forest plan timespan). Less than 5 percent are only somewhat or not at all interested. For comparative purposes, a majority of the respondents from the other Alaska communities sur

[5] Additional information from the surveys, including response rates and socioeconomic characteristics of respondents from each community, are provided in Brown (1999).

veyed are also very interested in the future of the CNF. This result is not too surprising given that those who were not interested in the future of the CNF likely would not have returned the survey.

The second question regarded the role that the public should play in the planning of the CNF. Table 31, shows that, forest-wide, a majority of the respondents from the 12 CNF communities of interest (57 percent) want equal partnership with the Forest Service in developing the 2000 forest plan (table 31). About 27 percent of the respondents prefer only to provide suggestions to the Forest Service. Fourteen percent of the respondents prefer to make decisions and have the Forest Service carry them out.

## Selected Forest Management Issues

The APU survey of communities was completed before the formal identification of issues through the National Environmental Policy Act scoping process. It does not, therefore, address all issues subsequently identified through the scoping process. Nevertheless, these selected issues—wilderness, wild and scenic rivers, timber management, road construction, new vehicular access to Prince William Sound, and snowmachine and all-terrain or off-road vehicle access—represented, at the time, the chief public concerns identified by CNF planning staff.

**Wilderness—**Currently, there is no congressionally designated wilderness on the CNF. In 1980, the Alaska National Interest Lands Conservation Act (ANILCA) created 14 wilderness areas on the Tongass National Forest but only named the 1.97-million-acre Nellie Juan-College Fjord Wilderness Study Area in western Prince William Sound on the CNF. Of the nearly 2.0 million acres, the 1984 forest plan recommends 1.7 million acres be designated as wilderness by Congress. The 1984 forest plan also states that pending action by the U.S. Congress, lands within the 1.97-million-acre study area be managed "to maintain presently existing wilderness character and potential for inclusion in the National Wilderness Preservation System" and to "follow the direction established in the Alaska National Interest Lands Conservation Act for wilderness management in Alaska" (USDA Forest Service 1998a).

The management of designated wilderness under ANILCA is potentially different than the management of most wilderness areas. Motorized forms of access (snowmobiles, ATVs, and aircraft) for allowed traditional and subsistence uses distinguish Alaska wilderness from non-Alaska wilderness.

The APU public survey included a question about preference of community residents for the amount of designated wilderness that should be recommended in the 2000 forest plan. Table 32 reveals that forest-wide, respondents from the 12 CNF communities of interest are nearly evenly split in their preferences for congressionally designated wilderness on the CNF. Thirty-two percent prefer that more than 1.7 million acres (the amount recommended to Congress in the 1984 forest plan) be recommended for wilderness designation in the 2000 forest plan. Another 30 percent favor 1.7 million acres; 20 percent prefer that no acreage be recommended for wilderness designation; and 14 percent prefer less than 1.7 million acres be recommended for designated wilderness. Among respondents from other Alaska communities, one-third favor the amount recommended in the 1984 forest plan, 28 percent prefer more than 1.7 million acres, and 21 percent favor no wilderness at all.

Communities where most respondents support additional wilderness (more than 1.7 million acres) include Anchorage (41 percent), Cordova (41 percent), Girdwood (40 percent), Hope (31 percent), Seward (35 percent), and Valdez (33 percent). Communities that are most in favor of the current recommendation of 1.7 million acres are Cooper Landing (42 percent), Whittier (40 percent), Kenai (35 percent), and Moose Pass (34 percent). Soldotna is the only community where respondents prefer less wilderness acreage (none or less than 1.7 million acres). Respondents from Sterling were nearly evenly divided among the four options.

**Table 30—Interest in what happens to Chugach National Forest in the next 10 to 15 years by community**

| Interest | Anchorage (n=76) | Cooper Landing (n=65) | Cordova (n=77) | Girdwood (n=79) | Hope (n=25) | Kenai (n=71) | Moose Pass (n=40) | Seward (n=73) | Soldotna (n=78) | Sterling (n=83) | Valdez (n=63) | Whittier (n=25) | Forest-wide (n=755) | Other Alaska communities (n=61) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Percent (and 95 percent confidence interval)* | | | | | | | | |
| None | 0 | 0 | 3 (0-11) | 0 | 0 | 1 (0-9) | 3 (0-15) | 0 | 0 | 0 | 0 | 0 | 1 (0-2) | 2 (0-11) |
| Somewhat interested | 11 (3-21) | 3 (0-12) | 1 (0-9) | 0 | 0 | 4 (0-14) | 0 | 0 | 4 (0-13) | 2 (0-10) | 2 (0-10) | 0 | 3 (1-4) | 10 (2-23) |
| Moderately interested | 25 (14-38) | 14 (5-27) | 8 (2-19) | 9 (3-18) | 4 (0-22) | 23 (11-37) | 5 (0-19) | 10 (3-5) | 19 (9-32) | 19 (10-31) | 25 (13-40) | 24 (6-48) | 16 (13-20) | 38 (22-54) |
| Very interested | 64 (50-77) | 83 (68-92) | 86 (72-94) | 91 (81-97) | 96 (74-100) | 72 (56-84) | 93 (74-99) | 89 (76-96) | 76 (61-86) | 78 (65-88) | 73 (57-85) | 72 (44-89) | 80 (76-84) | 51 (34-66) |
| No opinion | 0 | 0 | 3 (0-10) | 0 | 0 | 0 | 0 | 1 (0-9) | 1 (0-8) | 0 | 0 | 4 (0-23) | 1 (0-2) | 0 |

Source: Crone 1999a.

**Table 31—Preference for the role the public should play in Chugach National Forest (CNF) planning by community**

| Role | Anchorage (n=78) | Cooper Landing (n=62) | Cordova (n=76) | Girdwood (n=79) | Hope (n=27) | Kenai (n=71) | Moose Pass (n=40) | Seward (n=74) | Soldotna (n=79) | Sterling (n=83) | Valdez (n=63) | Whittier (n=25) | Forest-wide (n=757) | Other Alaska communities (n=61) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Percent (and 95 percent confidence interval)* | | | | | | | | |
| None | 1 (0-9) | 0 | 0 | 1 (0-9) | 0 | 0 | 0 | 0 | 0 | 1 (0-8) | 0 | 0 | 0 (0-1) | 2 (0-11) |
| Provide suggestions only | 33 (20-48) | 29 (16-44) | 26 (14-40) | 27 (14-41) | 22 (6-45) | 34 (20-49) | 23 (8-41) | 30 (17-44) | 27 (15-40) | 22 (11-35) | 29 (15-44) | 12 (1-35) | 27 (23-32) | 30 (15-46) |
| Equal partner with CNF | 56 (41-70) | 60 (43-74) | 54 (38-68) | 52 (36-66) | 48 (24-71) | 48 (32-63) | 68 (46-83) | 76 (48-76) | 54 (10-67) | 63 (47-75) | 57 (41-71) | 72 (43-90) | 57 (52-62) | 51 (33-67) |
| Make decisions | 8 (2-18) | 11 (3-24) | 14 (6-27) | 18 (8-31) | 30 (10-53) | 15 (6-29) | 10 (2-26) | 17 (1-17) | 19 (9-31) | 13 (5-25) | 14 (5-27) | 12 (1-35) | 14 (11-17) | 13 (4-27) |
| No opinion | 1 (0-9) | 0 | 5 (1-15) | 3 (0-11) | 0 | 3 (0-12) | 0 | 0 | 0 | 1 (0-8) | 0 | 4 (0-24) | 1 (1-3) | 5 (0-16) |

Source: Crone 1999a.

**Wild and scenic rivers**—Currently, there are no designated wild and scenic rivers on the CNF. The 1984 forest plan did not consider any rivers or streams for designation under the 1968 National Wild and Scenic Rivers Act. Currently, there are 23 rivers (or river segments) and three glaciers identified as possessing "outstandingly remarkable" resource value(s) and eligible for consideration and inclusion into the National Wild and Scenic Rivers System (USDA Forest Service 1998a.) The final number of rivers recommended for the 2000 forest plan was not yet finalized when we wrote this report.

Like designated wilderness, designated wild and scenic rivers are often perceived as restricting access to and development of public lands. Because ANILCA did not recommend any wild and scenic rivers on national forest lands, many believe that river designation is not needed. It is the position of the Forest Service that the 1976 National Forest Management Act requires it to consider the designation of wild and scenic rivers when preparing or revising forest plans. The APU public survey included a question about the preference of community residents for the number of new designated wild and scenic rivers that should be recommended in the 2000 forest plan. Table 33 shows that half of all respondents from the 12 CNF communities of interest favor the designation of many, if not all, eligible rivers as wild and scenic in the 2000 forest plan. Some 27 percent favor the designation of a few (five or less) eligible rivers. About 19 percent do not favor the designation of any wild and scenic rivers. In general, support for wild and scenic rivers seems somewhat greater than for designated wilderness areas.

Responses from residents of other Alaska communities reveal that 43 percent of this sample favor recommending all eligible rivers, whereas only 13 percent favor not recommending any designated wild and scenic rivers.

Communities where the largest percentage of respondents support many (five or more) new designated wild and scenic rivers include Girdwood (71 percent), Cordova (57 percent), Seward (56 percent), Hope (54 percent), Kenai (54 percent), Valdez (51 percent), Anchorage (48 percent), Moose Pass (46 percent), Whittier (42 percent), and Soldotna (38 percent). The only community preferring five or fewer new wild and scenic rivers is Sterling (40 percent). Opposition to any new wild and scenic rivers is greatest in Soldotna (25 percent), Whittier (25 percent), Kenai (24 percent), Hope (23 percent), Sterling (23 percent), and Valdez (22 percent).

**Timber management**—The amended 1984 forest plan set an ASQ of timber at an average of 8.5 MMBF per year for the first 10 years and an average of 16.9 MMBF per year thereafter (USDA Forest Service 1998a.) Market conditions and environmental changes (particularly an infestation of the spruce bark beetle) have resulted in an actual removal of about an average 2.1 MMBF per year over the past 13 years.

Public support or opposition to cutting timber on the CNF is often a function of the purpose of the cut, as well as whether the timber sales were "below cost," (that is, costing CNF more to administer the sale than it receives in payment). This issue mirrors a nationwide concern. The scope of the issue does not seem as great as it is on the Tongass National Forest because the volume of the cut is significantly lower and none of the 14 communities is economically dependent on the timber industry.

The APU survey included a question about preferences for the amount of timber for annual cutting, and a question concerning acceptable reasons for cutting. Table 34 shows that, forestwide, most respondents from the 12 CNF communities of interest (31 percent) feel that the current actual average cut of 2.1 million board feet per year is the most appropriate level for the 2000 forest plan ASQ. Twenty-one percent favor an ASQ of less than 2.1 million board feet per year, whereas another 20 percent would like to see an ASQ of 8.5 million board feet per year (the ASQ in the 1984 forest plan.) Fourteen percent wish to see no timber cut at all, and 5 percent favor increasing the ASQ beyond 8.5 million board feet annually.

**Table 32—-Preference for designated wilderness by community**

| Amount of wilderness | Anchorage (n=78) | Cooper Landing (n=64) | Cordova (n=74) | Girdwood (n=80) | Hope (n=26) | Kenai (n=71) | Moose Pass (n=38) | Seward (n=74) | Soldotna (n=77) | Sterling (n=81) | Valdez (n=63) | Whittier (n=25) | Forest-wide (n=751) | Other Alaska communities (n=61) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| None | 15 (6-28) | 11 (3-24) | 15 (6-28) | 10 (3-21) | 23 (5-48) | 21 (10-35) | 24 (8-44) | 23 (11-37) | 30 (17-44) | 25 (13-38) | 24 (11-39) | 24 (5-50) | 20 (16-24) | 21 (9-37) |
| Less than 1.7 million acres | 15 (6-28) | 19 (8-34) | 12 (4-25) | 13 (4-24) | 19 (3-44) | 13 (4-25) | 11 (1-29) | 8 (2-19) | 17 (7-30) | 21 (10-34) | 16 (6-30) | 4 (0-25) | 14 (11-18) | 10 (2-23) |
| 1.7 million acres | 30 (15-41) | 42 (26-58) | 27 (14-42) | 36 (22-51) | 19 (3-44) | 35 (21-51) | 34 (15-55) | 28 (15-43) | 22 (11-36) | 25 (13-38) | 24 (11-39) | 40 (15-65) | 30 (25-34) | 33 (17-49) |
| More than 1.7 million acres | 41 (26-56) | 22 (10-37) | 41 (26-56) | 40 (26-54) | 31 (10-56) | 25 (13-40) | 26 (10-47) | 35 (21-50) | 26 (14-40) | 25 (13-38) | 33 (18-50) | 28 (8-54) | 32 (27-36) | 28 (14-44) |
| No opinion | 1 (0-9) | 6 (1-18) | 5 (1-16) | 1 (0-8) | 8 ( 0-30) | 6 (1-16) | 5 (0-21) | 5 (1-16) | 5 (1-15) | 5 (1-14) | 3 (0-13) | 4 (0-25) | 4 (3-7) | 8 (1-21) |

Source: Crone 1999a.

**Table 33—Preference for designated wild and scenic rivers by community**

| Number of rivers | Anchorage (n=77) | Cooper Landing (n=64) | Cordova (n=77) | Girdwood (n=80) | Hope (n=26) | Kenai (n=71) | Moose Pass (n=39) | Seward (n=73) | Soldotna (n=79) | Sterling (n=82) | Valdez (n=63) | Whittier (n=24) | Forest-wide (n=755) | Other Alaska communities (n=60) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| None | 17 (7-30) | 16 (6-29) | 16 (6-28) | 8 (2-18) | 23 (6-48) | 24 (12-38) | 18 (5-37) | 19 (9-33) | 25 (14-39) | 23 (12-36) | 22 (10-37) | 25 (6-51) | 19 (16-23) | 13 (4-27) |
| Few (5 or less) | 33 (19-47) | 27 (14-42) | 22 (11-35) | 20 (10-33) | 19 (4-43) | 21 (10-35) | 31 (13-51) | 22 (11-36) | 35 (22-50) | 40 (26-54) | 24 (11-39) | 25 (6-51) | 27 (23-31) | 35 (20-51) |
| Many (all suitable) | 48 (33-62) | 53 (36-68) | 57 (42-71) | 71 (56-82) | 54 (27-76) | 54 (38-68) | 46 (25-66) | 56 (40-70) | 38 (24-52) | 31 (18-44) | 51 (34-66) | 42 (17-70) | 50 (46-55) | 43 (27-59) |
| No opinion | 3 (0-11) | 5 (0-15) | 5 (1-15) | 1 (0-8) | 4 (0-23) | 1 (0-9) | 5 (0-20) | 3 (0-11) | 1 (0-8) | 6 (1-16) | 3 (0-13) | 8 (0-31) | 3 (2-5) | 8 (2-21) |

Source: Crone 1999a.

**Table 34—Preference for amount of timber harvesting by community**

| Amount of timber | Anchorage (n=78) | Cooper Landing (n=63) | Cordova (n=74) | Girdwood (n=80) | Hope (n=26) | Kenai (n=71) | Moose Pass (n=38) | Seward (n=72) | Soldotna (n=78) | Sterling (n=82) | Valdez (n=62) | Whittier (n=25) | Forest-wide (n=750) | Other Alaska communities (n=60) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| None | 12 (4-24) | 8 (1-21) | 19 (8-33) | 29 (16-43) | 0 | 13 (4-26) | 13 (2-32) | 17 (7-30) | 17 (7-30) | 5 (1-15) | 16 (5-31) | 8 (0-31) | 14 (11-18) | 18 (7-34) |
| Less than 2.1 MMBF/year | 13 (4-25) | 14 (5-29) | 38 (23-53) | 30 (17-44) | 15 (2-39) | 11 (3-24) | 24 (8-45) | 19 (8-34) | 19 (9-33) | 18 (8-31) | 29 (14-45) | 20 (4-45) | 21 (17-25) | 23 (10-40) |
| 2.1 MMBF/year | 45 (29-60) | 38 (22-55) | 23 (11-37) | 28 (15-42) | 35 (12-60) | 35 (20-51) | 16 (3-36) | 29 (16-44) | 28 (15-43) | 31 (17-45) | 29 (14-45) | 40 (15-65) | 31 (27-36) | 20 (8-36) |
| 8.5 MMBF/year | 19 (9-33) | 24 (11-40) | 7 (1-18) | 11 (4-23) | 27 (7-52) | 30 (16-45) | 29 (11-50) | 21 (9-35) | 25 (12-39) | 28 (16-42) | 11 (3-25) | 24 (5-50) | 20 (17-24) | 22 (9-38) |
| More than 8.5 MMBF/year | 4 (0-13) | 6 (1-18) | 1 (0-9) | 0 | 12 (1-35) | 3 (0-12) | 5 (0-22) | 8 (2-20) | 5 (1-15) | 9 (2-19) | 5 (0-16) | 0 | 5 (3-7) | 2 (0-11) |
| No opinion | 8 (2-19) | 10 (2-23) | 12 (4-25) | 3 (0-11) | 12 (1-35) | 9 (2-20) | 13 (2-32) | 6 (1-16) | 6 (1-17) | 10 (3-21) | 11 (3-25) | 8 (0-31) | 8 (6-11) | 15 (5-30) |

Source: Crone 1999a.

Support for increasing the timber cut beyond 8.5 million board feet per year in the 12 CNF communities is strongest in Hope (12 percent), Sterling (9 percent), and Seward (8 percent). Support for no timber cutting is strongest in Girdwood (29 percent), Cordova (19 percent), and Soldotna and Seward (17 percent each). Many residents of Anchorage (45 percent), Cooper Landing (38 percent), Hope (35 percent), Kenai (35 percent), Sterling (31 percent), Seward (29 percent), and Soldotna (28 percent) favor continuing to cut timber at the historic average of 2.1 million board feet per year.

Of respondents from other Alaska communities, the largest group (23 percent) favors the cutting of less than 2.1 million board feet per year. Twenty-two percent prefer 8.5 million board feet, 20 percent prefer 2.1 million board feet, and 18 percent favor no timber cutting at all. Less than 2 percent favor cutting more than 8.5 million board feet of timber on average. Table 35 shows that across all respondents from the 12 CNF communities, the most acceptable condition for cutting timber is for the removal of dead or insect-infested trees (80 percent), followed by the prevention of fire and the subsequent protection of life and personal property (74 percent), and creating or improving wildlife habitat (68 percent). Cutting timber for commercial profit was the least acceptable condition (23 percent). Eight percent feel there are no acceptable reasons for cutting timber.

Table 35 also shows that respondents from other Alaska communities feel that the most acceptable condition for cutting timber is for the removal of dead or insect-infested trees (79 percent), followed by creating or improving wildlife habitat (67 percent), prevention of fire and the subsequent protection of life and personal property (59 percent), and commercial profit (26 percent.) Ten percent feel there is no acceptable reason for cutting timber.

**Road construction—**The CNF is inventoried as 98 percent roadless (USDA Forest Service 1998a.) Within its boundaries, public access is primarily by on-road automobile along the 95 miles of the Seward and Sterling state highways. About 59 miles of forest road in the Kenai Peninsula and across the Copper River Delta east of Cordova, and an additional 586 miles of forest development roads exist within the CNF. This is offset by provisions of the 1980 ANILCA, which permits the use of other motorized forms of access, including snowmobiles, all-terrain vehicle (ATVs), motorboats, and aircraft, on CNF for "traditional" and subsistence purposes. The use of such motorized forms of transportation solely for recreation, however, does not enjoy the same consideration. The use of motorized transportation for recreation is often viewed as incompatible with subsistence uses of motorized transportation, and both are often viewed as incompatible with nonmotorized forms of recreation and the desire for solitude.

As shown in table 36, most of respondents in all communities favored constructing a few (five or fewer) new roads. Communities most in favor of five or more new roads are Sterling (28 percent), Moose Pass (23 percent), Seward (22 percent), and Anchorage (21 percent). Communities most in favor of not constructing new roads are Cordova (37 percent), Hope (31 percent), and Moose Pass (28 percent).

Table 37 reveals that 76 percent of all respondents from the 12 CNF communities thought that new roads should be built for vegetation management. Preferences for other road purposes include scenic road touring (60 percent), hunting and fishing access (55 percent), off-road vehicle access (43 percent), and commercial timber (37 percent). Again, respondents from other Alaska communities express nearly identical preferences.

**Prince William Sound Access—**Construction of direct vehicular access to Whittier through existing railroad tunnels is expected to be completed in mid-2000 (USDA Forest Service 1998a). Projections of up to a million additional people will enter Prince William Sound each year through Whittier because of the new road. The Whittier community is in turn planning to double the size of its small boat harbor. The community of Chenega Bay has installed a fuel dock to service and attract the anticipated increase in boat use as it spreads throughout the sound. The significant

**Table 35—Acceptable conditions for timber harvest by community**

| Condition | Anchorage (n=78) | Cooper Landing (n=63) | Cordova (n=76) | Girdwood (n=80) | Hope (n=26) | Kenai (n=70) | Moose Pass (n=40) | Seward (n=73) | Soldotna (n=79) | Sterling (n=83) | Valdez (n=63) | Whittier (n=25) | Forest-wide (n=756) | Other Alaska communities (n=61) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| None | 1 (0-4) | 5 (0-10) | 11 (3-18) | 18 (9-26) | 0 | 10 (3-17) | 8 (0-16) | 10 (3-16) | 13 (5-20) | 1 (0-4) | 10 (2-17) | 0 | 8 (6-10) | 10 (2-17) |
| Commercial profit | 27 (10-37) | 21 (10-31) | 30 (20-41) | 15 (7-23) | 12 (0-25) | 24 (14-35) | 30 (15-45) | 23 (13-33) | 18 (9-26) | 30 (20-40) | 17 (8-27) | 36 (16-56) | 23 (20-26) | 26 (15-38) |
| Create wildlife habitat | 73 (63-83) | 68 (56-80) | 62 (51-73) | 51 (4-62) | 81 (64-97) | 76 (65-86) | 65 (50-80) | 71 (61-82) | 67 (56-78) | 75 (65-84) | 70 (58-81) | 64 (44-84) | 68 (65-71) | 67 (55-79) |
| Remove dead or insect-infested trees | 86 (78-94) | 87 (79-96) | 68 (58-79) | 66 (56-77) | 92 (81-100) | 81 (72-91) | 65 (50-80) | 79 (70-89) | 81 (72-90) | 89 (82-96) | 78 (67-88) | 96 (88-100) | 80 (77-83) | 79 (68-89) |
| Fire prevention/life and property | 86 (77-93) | 71 (60-83) | 71 (61-81) | 64 (53-74) | 88 (75-100) | 69 (57-80) | 90 (80-100) | 79 (70-89) | 68 (58-79) | 77 (68-86) | 62 (50-74) | 80 (63-97) | 74 (71-77) | 59 (46-72) |
| No opinion | 1 (0-4) | 0 | 3 (61-81) | 0 | 0 | 1 (0-4) | 0 | 0 | 0 | 2 (0-6) | 2 (0-5) | 0 | 1 (0-2) | 7 (0-13) |

Source: Crone 1999a.

**Table 36—Preference for amount of new roads by community**

| Number of new roads | Anchorage (n=78) | Cooper Landing (n=64) | Cordova (n=73) | Girdwood (n=76) | Hope (n=26) | Kenai (n=68) | Moose Pass (n=39) | Seward (n=74) | Soldotna (n=78) | Sterling (n=82) | Valdez (n=63) | Whittier (n=24) | Forest-wide (n=745) | Other Alaska communities (n=61) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| None | 9 | 22 | 37 | 26 | 31 | 13 | 28 | 22 | 21 | 18 | 24 | 17 | 22 | 28 |
| | (2-20) | (10-37) | (23-52) | (15-40) | (10-56) | (5-26) | (12-48) | (11-35) | (10-33) | (9-31) | (12-38) | (3-41) | (18-26) | (14-44) |
| Few (5 or less) | 65 | 67 | 52 | 61 | 50 | 68 | 49 | 54 | 63 | 52 | 59 | 97 | 60 | 56 |
| | (50-78) | (50-80) | (36-66) | (46-73) | (24-73) | (51-80) | (28-68) | (38-68) | (48-75) | (38-66) | (42-73) | (51-94) | (55-64) | (38-71) |
| Many (5 or more) | 21 | 9 | 7 | 13 | 15 | 16 | 23 | 22 | 17 | 28 | 18 | 4 | 17 | 12 |
| | (10-34) | (2-22) | (1-17) | (5-25) | (2-39) | (6-30) | (9-42) | (11-35) | (8-29) | (16-42) | (7-31) | (0-24) | (13-20) | (3-25) |
| No opinion | 5 | 2 | 4 | 0 | 4 | 3 | 0 | 3 | 0 | 1 | 0 | 0 | 2 | 5 |
| | (1-14) | (0-10) | (0-13) | | (0-23) | (0-12) | | (0-11) | | (0-8) | | | (1-3) | (0-16) |

Source: Crone 1999a.

**Table 37—Acceptable purposes for constructing new roads by community**

| Purpose | Anchorage (n=70) | Cooper Landing (n=54) | Cordova (n=50) | Girdwood (n=61) | Hope (n=18) | Kenai (n=63) | Moose Pass (n=30) | Seward (n=59) | Soldotna (n=66) | Sterling (n=70) | Valdez (n=47) | Whittier (n=23) | Forest-wide (n=611) | Other Alaska communities (n=47) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| Commercial timber | 36 | 37 | 40 | 26 | 44 | 40 | 47 | 44 | 33 | 47 | 32 | 17 | 37 | 34 |
| | (24-47) | (24-50) | (26-54) | (15-38) | (19-70) | (27-52) | (28-66) | (31-57) | (22-45) | (35-59) | (18-46) | (1-34) | (33-41) | (20-48) |
| Off-road vehicle access | 41 | 37 | 42 | 39 | 28 | 40 | 47 | 39 | 42 | 54 | 64 | 30 | 43 | 40 |
| | (30-53) | (24-50) | (28-56) | (27-52) | (5-51) | (27-52) | (28-66) | (26-52) | (30-55) | (42-66) | (50-78) | (10-51) | (39-47) | (26-55) |
| Scenic road touring | 77 | 48 | 56 | 49 | 61 | 65 | 40 | 51 | 65 | 63 | 81 | 48 | 60 | 68 |
| | (67-87) | (34-62) | (42-70) | (36-62) | (36-86) | (53-77) | (21-59) | (38-64) | (53-77) | (52-74) | (69-92) | (26-70) | (56-64) | (54-82) |
| Hunting and fishing | 63 | 35 | 62 | 48 | 50 | 62 | 37 | 59 | 53 | 66 | 57 | 57 | 55 | 64 |
| | (51-74) | (22-48) | (48-76) | (35-60) | (24-76) | (50-74) | (18-55) | (46-72) | (41-65) | (54-77) | (43-72) | (35-78) | (51-59) | (50-78) |
| Vegetation management | 80 | 83 | 54 | 77 | 89 | 76 | 77 | 86 | 82 | 79 | 70 | 52 | 76 | 81 |
| | (70-90) | (73-94) | (40-68) | (66-88) | (73-100) | (65-87) | (61-93) | (77-95) | (72-91) | (69-88) | (57-84) | (30-74) | (73-80) | (69-92) |
| No opinion | 3 | 2 | 8 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 2 | 9 | 2 | 4 |
| | (0-7) | (0-6) | (0-16) | | | (0-5) | | | | (0-4) | (0-6) | (0-21) | (1-3) | (0-10) |

Source: Crone 1999a.

increase in new use is expected to create various recreation management problems related to the condition of the Nellie Juan-College Fiord Wilderness Study Area, overcrowding and displacement of existing users, impacts on upland areas adjacent to the sound, and public facilities throughout the sound.

The APU survey included a question about how CNF should respond to the expected new demand and associated impacts to the uplands and coastline. Results from this question are shown in table 38. Forest-wide, nearly half of the respondents from the 12 CNF communities felt that CNF should only create new facilities for mitigating expected adverse environmental impacts. Thirty-seven percent favor creating additional facilities that would not only mitigate expected impacts but would also expand public recreation opportunities throughout the sound. Another 11 percent recommend no action.

Respondents from other Alaska communities agreed with respondents from the 12 CNF communities of interest in terms of their preference for action (53 percent favor minimal facilities, 27 percent favor expanded facilities, and 13 percent favor no action).

Communities most in favor of expanding recreation facilities are Soldotna (55 percent), Sterling (51 percent), and Anchorage (50 percent.) Communities most preferring minimal facilities for mitigation purposes are Girdwood (71 percent) and Seward (60 percent). Additionally, at least 50 percent of the respondents from the communities of Cooper Landing, Cordova, Hope, and Moose Pass favor the minimal facility approach.

**Open areas for snowmachines and all-terrain or off-road vehicles—**Currently, by forest order, most of the CNF is closed to ATV or off-road vehicle (ORV) use. A large portion of the forest is open east and northeast of Cordova. Conversely, most of the CNF is open to snowmobiles for traditional and subsistence uses (provided there is adequate snow cover) under provisions of the 1980 ANILCA. The use of these forms of motorized access generates much debate about their appropriateness and the nature of environmental and social impacts associated with their use. For example, the noise associated with snowmachines and ATVs or ORVs is a major issue for those wishing to experience solitude in a forest setting.

The APU survey asked respondents their preferences for the amount of area within the CNF that should be open to the use of snowmachines and ATVs or ORVs. Preferences of respondents for the amount of area open to snowmachine use and ATV or ORV use are shown in tables 39 and 40, respectively. Forest-wide, the response chosen most often was the current amount for both snowmachine area (41 percent) and ATV or ORV areas (37 percent). Thirty-one percent of respondents would like more areas open to snowmachines, and 26 percent would like more areas open to ATVS or ORVs. More respondents are in favor of reducing the amount of forest open to ATV and ORV use (28 percent) than to snowmachine use (17 percent). Eleven percent of the respondents are undecided about the appropriate area for snowmachine use, whereas 9 percent are undecided about the appropriate area for ATV and ORV use. The preferences of respondents from other communities in Alaska closely follow those of forest-wide respondents, although a higher percentage of respondents have no opinion on snowmachine use (22 percent) and ATV or ORV use (18 percent).

Communities most in favor of increased snowmachine access are Sterling (47 percent), Valdez (41 percent), and Soldotna (36 percent), whereas the communities of Cooper Landing (25 percent) and Whittier (24 percent) are most in favor of decreased snowmachine access. Forty-two percent of the Valdez respondents are in favor of increased ATV or ORV access, followed by Sterling (33 percent), and Cordova (31 percent). Respondents from Girdwood (35 percent) are most in favor of decreased ATV or ORV use, followed closely by Anchorage (34 percent), and Hope and Moose Pass (both 33 percent).

## General Forest Uses

A second area of interest in the APU survey is an examination of general forest uses—without respect to the specific management issues identified in the previous section. The survey presented

**Table 38—Preference for management response to Whittier access road to Prince William Sound by community**

| Management response | Anchorage (n=78) | Cooper Landing (n=64) | Cordova (n=76) | Girdwood (n=79) | Hope (n=27) | Kenai (n=71) | Moose Pass (n=40) | Seward (n=74) | Soldotna (n=78) | Sterling (n=82) | Valdez (n=62) | Whittier (n=25) | Forest-wide (n=756) | Other Alaska communities (n=60) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| No action | 6 (1-16) | 8 (1-20) | 22 (11-36) | 5 (1-14) | 7 (0-28) | 11 (4-23) | 8 (0-23) | 8 (2-20) | 9 (2-20) | 11 (4-22) | 18 (7-32) | 12 (1-35) | 11 (8-14) | 13 (4-27) |
| Minimal facilities to mitigate | 40 (26-54) | 53 (36-68) | 55 (40-69) | 71 (56-82) | 56 (29-77) | 35 (21-50) | 55 (33-73) | 60 (44-73) | 41 (27-55) | 33 (20-47) | 44 (27-59) | 44 (19-69) | 48 (44-53) | 53 (36-69) |
| Expand facilities to enhance | 50 (35-64) | 34 (20-50) | 15 (6-27) | 24 (13-37) | 33 (12-58) | 49 (34-64) | 33 (15-52) | 30 (17-44) | 55 (30-59) | 51 (37-65) | 37 (22-53) | 40 (16-65) | 37 (33-42) | 27 (13-43) |
| No opinion | 4 (0-13) | 5 (0-15) | 8 (2-18) | 0 | 4 (0-22) | 4 (0-14) | 5 (0-20) | 3 (0-11) | 5 (0-14) | 5 (1-14) | 2 (0-10) | 4 (0-24) | 4 (2-6) | 7 (1-19) |

Source: Crone 1999a.

**Table 39—Preference for open areas for snowmachines by community**

| Amount of open area | Anchorage (n=79) | Cooper Landing (n=64) | Cordova (n=76) | Girdwood (n=79) | Hope (n=26) | Kenai (n=71) | Moose Pass (n=40) | Seward (n=73) | Soldotna (n=78) | Sterling (n=83) | Valdez (n=63) | Whittier (n=25) | Forest-wide (n=757) | Other Alaska communities (n=60) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| Current amount | 33 (20-47) | 47 (31-62) | 43 (29-58) | 49 (34-63) | 46 (21-70) | 39 (25-54) | 53 (31-71) | 48 (32-62) | 37 (23-51) | 35 (22-49) | 30 (16-46) | 32 (10-57) | 41 (36-45) | 38 (23-55) |
| Increase area or season | 33 (20-47) | 22 (10-37) | 25 (13-40) | 20 (9-33) | 35 (13-59) | 28 (15-43) | 28 (11-47) | 27 (14-42) | 36 (22-50) | 47 (33-61) | 41 (25-57) | 20 (4-45) | 31 (26-35) | 23 (11-39) |
| Decrease area or season | 17 (7-29) | 25 (12-40) | 21 (10-34) | 20 (9-33) | 12 (1-34) | 13 (4-25) | 15 (4-33) | 19 (8-33) | 18 (8-31) | 8 (2-19) | 13 (4-26) | 24 (6-49) | 17 (13-21) | 17 (6-31) |
| No opinion | 18 (8-30) | 6 (1-17) | 11 (3-22) | 10 (0-8) | 8 (0-29) | 20 (9-33) | 5 (0-20) | 6 (1-16) | 9 (2-20) | 10 ( 3-20) | 16 (6-30) | 24 (6-49) | 11 (9-15) | 22 (10-37) |

Source: Crone 1999a.

**Table 40—Preference for open areas for off-road vehicles by community**

| Amount of open area | Anchorage | Cooper Landing | Cordova | Girdwood | Hope | Kenai | Moose Pass | Seward | Soldotna | Sterling | Valdez | Whittier | Forest-wide | Other Alaska communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (n=79) | (n=63) | (n=77) | (n=79) | (n=27) | (n=71) | (n=40) | (n=72) | (n=79) | (n=83) | (n=62) | (n=25) | (n=759) | (n=60) |
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| Current amount | 30 | 41 | 33 | 43 | 44 | 37 | 45 | 42 | 38 | 40 | 24 | 36 | 37 | 42 |
| | (18-44) | (25-57) | (19-47) | (28-57) | (20-68) | (22-52) | (25-64) | (26-56) | (24-52) | (26-54) | (12-40) | (13-61) | (33-42) | (25-58) |
| Increase area or season | 24 | 16 | 31 | 13 | 19 | 25 | 23 | 29 | 29 | 33 | 42 | 12 | 26 | 13 |
| | (13-37) | (6-30) | (18-45) | (5-24) | (4-42) | (13-40) | (8-41) | (17-45) | (17-43) | (20-46) | (26-58) | (1-35) | (22-30) | (4-27) |
| Decrease area or season | 34 | 30 | 29 | 35 | 33 | 23 | 33 | 26 | 24 | 17 | 26 | 28 | 28 | 27 |
| | (21-48) | (16-46) | (16-43) | (23-50) | (12-58) | (11-37) | (15-52) | (14-40) | (13-37) | (8-29) | (13-41) | (8-53) | (24-32) | (13-43) |
| No opinion | 11 | 13 | 8 | 9 | 4 | 16 | 0 | 3 | 9 | 11 | 8 | 24 | 9 | 18 |
| | (4-23) | (4-26) | (2-18) | (2-19) | (0-23) | (6-29) | | (0-11) | (2-19) | (4-22) | (2-20) | (6-49) | (7-12) | (7-33) |

Source: Crone 1999a.

| Ecosystem Value | Ecosystem Definition |
|---|---|
| **Aesthetic** | "I value the forest because I enjoy the forest scenery, sights, sounds, smells, etc." |
| **Biological diversity** | "I value the forest because it provides a variety of fish, wildlife, plant life, etc." |
| **Cultural** | "I value the forest because it is a place for me to continue and pass down the wisdom and knowledge, traditions, and way of life of my ancestors." |
| **Economic** | "I value the forest because it provides timber, fisheries, minerals, or tourism opportunities such as outfitting and guiding." |
| **Future** | "I value the forest because it allows future generations to know and experience the forest as it is now." |
| **Historic** | "I value the forest because it has places and things of natural and human history that matter to me, others, and the Nation." |
| **Intrinsic** | "I value the forest in and of itself for its existence, no mater what I or others think about the forest." |
| **Learning** | "I value the forest because we can learn about the environment through scientific observation or experimentation." |
| **Life support** | "I value the forest because it helps produce, preserve, clean, and renew air, soil, and water." |
| **Recreation** | "I value the forest because it provides a place for my favorite outdoor recreation activities." |
| **Spiritual** | "I value the forest because it is a sacred, religious, or spiritually special place to me or because I feel reverence and respect for nature there." |
| **Subsistence** | "I value the forest because it provides necessary food and supplies to sustain my life." |
| **Therapeutic** | "I value the forest because it makes me feel better, physically and/or mentally." |

Figure 19—Definitions of forest ecosystem values (Developed by Chugach planning team based on Rolston 1988).

a list of 19 general forest uses and asked respondents whether they favored or opposed such general forest use, and to what degree (on a scale where 5 = "strongly favor," 3 = "neither favored or opposed," and 1 = "strongly oppose"). Again, these general forest uses were felt at the time of the survey to be the most likely uses of CNF in the future.

As shown in table 41, forest-wide, the most publicly favored general forest uses—fish and wildlife habitat (4.6), camping and picnicking (4.4), nonmotorized recreation (4.3), wildlife viewing and observation (4.3), and gathering forest products (4.3)—are less resource consumptive than the most opposed uses. The most opposed general forest uses, which are mostly commercial, include mining (2.5), oil and gas (2.6), logging (2.7), outfitting and guiding (3.2), motorized recreation (3.2), communication sites and utility easements (3.2), and helicopter skiing and hiking (3.2). Note that although the commercial forest uses are more opposed relative to the other general forest uses, they are, in general, rated as neither favored nor opposed on the absolute rating scale ranging from strongly favored to strongly opposed. Respondents from other Alaska communities expressed similar opinions.

Beyond the near universal ranking of fish and wildlife habitat as the most favored general forest use, some differences exist between the respondent ratings of the 12 CNF communities. Notable are the high ratings for subsistence hunting and fishing by respondents from Cordova (4.5) and Whittier (4.4). Commercial tourism is rated lowest by respondents from Cordova (3.0) and Sterling (3.0).

A factor analysis of the data indicates that the 19 individual general forest uses may be combined to produce five significant groups of uses, which together explain an even greater amount of variance in the data than individual uses. The five groupings (as labeled by APU and CNF researchers) represent (1) "nonconsumptive commercial" uses (commercial outfitting and guiding, and helicopter skiing and hiking); (2) "consumptive commercial" uses (oil and gas drilling, commercial mining, commercial logging, and (in an inverse relationship) wilderness; (3) "sport hunting and fishing"; (4) "subsistence" (subsistence hunting and fishing, gathering forest products, and providing clean water); and (5) "recreation" (fish and wildlife habitat, nonmotorized recreation, and motorized recreation).

## Forest Ecosystem Values

The view that the sole purpose of national forests is to provide a supply of natural resources for the production of commodities no longer adequately represents how society regards these public lands. Ecosystem values are different than general forest uses and there is not necessarily a one-to-one correspondence between the two.

The APU survey asked respondents to rate the importance of 13 distinct forest ecosystem values taken from Rolston (1988) and shown in figure 19. Specifically, respondents were asked to allocate a sum of $100 among the 13 values in

**Table 41—Preferences for selected forest uses by community**

| Forest use | Anchorage (n=77) | Cooper Landing (n=65) | Cordova (n=74) | Girdwood (n=80) | Hope (n=26) | Kenai (n=71) | Moose Pass (n=40) | Seward (n=74) | Soldotna (n=79) | Sterling (n=80) | Valdez (n = 63) | Whittier (n=25) | Forest-wide (n=752) | Other Alaska communities (n=61) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 5 = "strongly favor" to 1 = "strongly oppose" (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| Fish and wildlife habitat | 4.6 (4.5-4.7) | 4.6 (4.5-4.8) | 4.6 (4.5-4.8) | 4.7 (4.6-4.8) | 4.4 (4.1-4.8) | 4.6 (4.4-4.7) | 4.6 (4.4-4.8) | 4.5 (4.3-4.7) | 4.5 (4.4-4.7) | 4.4 (4.3-4.6) | 4.7 (4.4-4.8) | 4.5 (4.3-4.7) | 4.6 (4.53-4.62) | 4.4 (4.2-4.5) |
| Camping and picnicking | 4.5 (4.4-4.7) | 4.3 (4.2-4.5) | 4.3 (4.2-4.5) | 4.5 (4.3-4.6) | 4.2 (3.8-4.5) | 4.5 (4.3-4.7) | 4.3 (4.1-4.5) | 4.4 (4.2-4.5) | 4.4 (4.3-4.5) | 4.4 (4.3-4.5) | 4.3 (4.1-4.5) | 4.3 (4.1-4.5) | 4.4 (4.34-4.44) | 4.2 (4.0-4.3) |
| Nonmotorized recreation | 4.5 (4.3-4.6) | 4.5 (4.3-4.6) | 4.4 (4.2-4.6) | 4.5 (4.3-4.7) | 4.3 (3.9-4.7) | 4.3 (4.1-4.6) | 4.2 (3.9-4.5) | 4.4 (4.2-4.6) | 4.3 (4.1-4.5) | 4.1 (4.0-4.4) | 4.1 (3.8-4.3) | 4.1 (3.8-4.4) | 4.3 (4.27-4.40) | 4.0 (3.8-4.3) |
| Wildlife viewing and observation | 4.5 (4.3-4.6) | 4.3 (4.1-4.5) | 4.3 (4.1-4.5) | 4.6 (4.4-4.7) | 4.1 (3.7-4.6) | 4.2 (4.1-4.4) | 4.3 (4.1-4.5) | 4.3 (4.2-4.5) | 4.2 (4.0-4.4) | 4.2 (4.1-4.4) | 4.2 (3.9-4.4) | 4.2 (4.0-4.5) | 4.3 (4.27-4.37) | 4.2 (4.1-4.4) |
| Gathering forest products | 4.3 (4.2-4.5) | 4.2 (4.0-4.4) | 4.5 (4.4-4.7) | 4.2 (4.1-4.4) | 4.3 (4.0-4.7) | 4.1 (3.9-4.3) | 4.3 (4.0-4.5) | 4.4 (4.2-4.6) | 4.2 (4.0-4.4) | 4.3 (4.2-4.4) | 4.2 (4.0-4.4) | 4.3 (4.0-4.5) | 4.3 (4.24-4.34) | 4.0 (3.8-4.2) |
| Providing fresh water | 4.3 (4.2-4.5) | 4.2 (4.0-4.4) | 4.3 (4.1-4.5) | 4.2 (4.0-4.4) | 4.0 (3.6-4.4) | 4.1 (4.0-4.3) | 4.3 (4.0-4.6) | 4.4 (4.3-4.6) | 4.0 (3.8-4.2) | 4.1 (4.0-4.3) | 4.0 (3.8-4.3) | 3.9 (3.6-4.2) | 4.2 (4.14-4.26) | 4.0 (3.8-4.3) |
| Sport fishing | 4.3 (4.0-4.4) | 4.3 (4.1-4.4) | 3.9 (3.7-4.1) | 4.0 (3.9-4.2) | 3.7 (3.2-4.1) | 4.2 (4.0-4.4) | 4.1 (3.9-4.4) | 4.1 (3.8-4.3) | 4.1 (3.9-4.3) | 4.3 (4.1-4.5) | 4.1 (3.9-4.3) | 4.2 (3.9-4.5) | 4.1 (4.05-4.18) | 4.0 (3.8-4.3) |
| Sightseeing | 4.3 (4.2-4.5) | 3.9 (3.7-4.1) | 4.0 (3.8-4.2) | 3.9 (3.6-4.1) | 3.8 (3.5-4.2) | 4.2 (4.0-4.4) | 4.0 (3.7-4.2) | 4.1 (3.8-4.3) | 4.1 (3.9-4.3) | 4.2 (4.0-4.4) | 4.2 (4.1-4.4) | 3.8 (3.5-4.2) | 4.1 (4.01-4.13) | 4.0 (3.8-4.2) |
| Wilderness | 4.0 (3.7-4.2) | 3.9 (3.6-4.2) | 4.2 (3.9-4.4) | 4.2 (4.0-4.5) | 3.7 3.1-4.2 | 3.8 (3.6-4.1) | 4.0 (3.6-4.3) | 4.0 (3.7-4.3) | 3.9 (3.6-4.1) | 3.8 (3.5-4.0) | 3.7 (3.4-4.0) | 4.0 (3.5-4.5) | 3.9 (3.85-4.02) | 3.7 (3.4-4.0) |
| Sport hunting | 3.6 (3.4-3.9) | 3.9 (3.7-4.2) | 3.7 (3.4-4.0) | 3.4 (3.1-3.7) | 3.3 (2.8-3.9) | 4.0 (3.7-4.2) | 4.1 (3.8-4.4) | 4.0 (3.7-4.3) | 3.8 (3.6-4.1) | 4.2 (4.0-4.4) | 3.9 (3.6-4.1) | 4.0 (3.7-4.2) | 3.8 (3.76-3.92) | 3.7 (3.4-4.0) |
| Subsistence fishing and hunting | 3.8 (3.6-4.0) | 3.5 (3.2-3.8) | 4.5 (4.3-4.6) | 3.8 (3.6-4.0) | 3.9 (3.4-4.3) | 3.6 (3.3-3.9) | 4.0 (3.6-4.3) | 3.9 (3.7-4.2) | 3.5 (3.3-3.8) | 3.7 (3.4-3.9) | 3.9 (3.6-4.2) | 4.4 (4.1-4.6) | 3.8 (3.75-3.91) | 3.8 (3.5-4.0) |

**Table 41—Preferences for selected forest uses by community (continued)**

| Forest use | Anchorage (n=77) | Cooper Landing (n=65) | Cordova (n=74) | Girdwood (n=80) | Hope (n=26) | Kenai (n=71) | Moose Pass (n=40) | Seward (n=74) | Soldotna (n=79) | Sterling (n=80) | Valdez (n = 63) | Whittier (n=25) | Forest-wide (n=752) | Other Alaska communities (n=61) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 5 = "strongly favor" to 1 = "strongly oppose" (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| Commercial tourism | 3.4 (3.2-3.6) | 3.3 (3.1-3.6) | 3.0 (2.7-3.3) | 3.4 (3.2-3.7) | 3.2 (2.8-3.7) | 3.3 (3.1-3.6) | 3.3 (2.9-3.6) | 3.2 (3.0-3.5) | 3.1 (2.8-3.3) | 3.0 (2.7-3.2) | 3.4 (3.2-3.7) | 3.4 (3.0-3.8) | 3.3 (3.2-3.3) | 3.1 (2.9-3.4) |
| Helicopter skiing and hiking | 3.4 (3.2-3.6) | 2.9 (2.6-3.1) | 3.3 (3.1-3.5) | 3.5 (3.2-3.7) | 2.8 (2.5-3.1) | 3.4 (3.1-3.6) | 2.8 (2.5-3.2) | 3.1 (2.8-3.3) | 3.1 (2.9-3.4) | 3.2 (3.0-3.4) | 3.5 (3.3-3.8) | 3.2 (2.8-3.7) | 3.2 (3.1-3.3) | 3.3 (3.1-3.6) |
| Communications and utilities | 3.2 (3.0-3.4) | 3.2 (3.0-3.4) | 3.4 (3.1-3.6) | 3.1 (2.8-3.3) | 3.1 (2.7-3.5) | 3.3 (3.1-3.5) | 3.1 (2.8-3.4) | 3.1 (2.9-3.4) | 2.9 (2.7-3.1) | 3.2 (3.0-3.4) | 3.3 (3.1-3.5) | 3.3 (2.9-3.8) | 3.2 (3.1-3.2) | 3.0 (2.7-3.2) |
| Motorized recreation | 3.1 (2.8-3.4) | 3.0 (2.7-3.3) | 3.1 (2.8-3.4) | 2.9 (2.6-3.2) | 3.0 (2.5-3.5) | 3.2 (2.9-3.5) | 3.3 (2.8-3.7) | 3.1 (2.8-3.5) | 3.3 (3.1-3.6) | 3.4 (3.1-3.7) | 3.3 (2.9-3.6) | 3.0 (2.5-3.5) | 3.2 (3.1-3.3) | 3.1 (2.8-3.4) |
| Commercial outfitting/guiding | 3.1 (3.0-3.4) | 3.2 (3.0-3.5) | 3.1 (2.8-3.4) | 3.4 (3.2-3.7) | 3.0 (2.4-3.5) | 3.1 (2.9-3.4) | 3.2 (2.9-3.6) | 3.2 (3.0-3.5) | 2.7 (2.5-3.0) | 3.0 (2.8-3.3) | 3.3 (3.0-3.5) | 3.6 (3.2-4.0) | 3.2 (3.1-3.2) | 3.0 (2.7-3.3) |
| Commercial logging | 2.7 (2.5-3.0) | 3.0 (2.7-3.3) | 2.4 (2.1-2.7) | 2.3 (2.0-2.5) | 2.8 (2.3-3.4) | 2.9 (2.6-3.2) | 2.9 (2.5-3.3) | 2.7 (2.4-3.0) | 2.8 (2.5-3.0) | 3.1 (2.8-3.4) | 2.6 (2.3-2.9) | 2.8 (2.3-3.3) | 2.7 (2.6-2.8) | 2.6 (2.2-2.9) |
| Commercial oil and gas | 2.7 (2.4-2.9) | 2.7 (2.4-2.9) | 2.3 (2.1-2.6) | 2.3 (2.0-2.6) | 2.3 (1.8-2.8) | 3.0 (2.7-3.3) | 2.6 (2.2-3.0) | 2.5 (2.2-2.7) | 2.6 (2.3-2.9) | 2.8 (2.5-3.1) | 2.6 (2.3-2.9) | 2.6 (2.1-3.2) | 2.6 (2.5-2.7) | 2.4 (2.1-2.7) |
| Commercial mining | 2.6 (2.3-2.8) | 2.3 (2.1-2.6) | 2.4 (2.1-2.7) | 2.2 (1.9-2.4) | 2.5 (1.9-3.0) | 2.7 (2.4-2.9) | 2.5 (2.1-2.9) | 2.7 (2.4-2.9) | 2.5 (2.3-2.7) | 2.8 (2.5-3.0) | 2.6 (2.4-2.9) | 3.0 (2.5-3.4) | 2.5 (2.4-2.6) | 2.5 (2.2-2.8) |

Source: Crone 1999a.

order to ensure that the value is retained in the 2000 forest plan. Because the sum was equal to $100, the dollar values are the same as percentage values. The results of this question are shown in table 42.

Forest-wide, respondents from the 12 CNF communities rated recreation ($14.90 or 14.9 percent) as the most important forest ecosystem value of the CNF, followed by life support (13.3 percent), and aesthetic (12.4 percent). The least important forest ecosystem values are cultural (2.2 percent) and historic (3.3 percent). Respondents from other Alaska communities often agreed with respondents from the 12 CNF communities of interest.

As with general forest uses, the perceptions of the respondents from the 12 CNF communities also differed by community. Cordova respondents consider the subsistence ecosystem value to be the most important in their community (13.5 percent). Respondents from Sterling (20.6 percent), Kenai (18.5 percent), and Anchorage (17.5 percent) rate recreation as the most important forest ecosystem value, while respondents from Hope (8.1 percent) and Whittier (9.3 percent) rate it much lower. Economic value is rated highest in Whittier (14.5 percent) and Sterling (10.8 percent) and lowest in Moose Pass (5.5 percent) and Valdez (5.8 percent). Spiritual value is rated highest in Hope (6.1 percent), Seward (6.1 percent) and Girdwood (6.0 percent) and lowest in Sterling (2.0 percent) and Valdez (2.3).

Unlike the case with general forest uses, a factor analysis of the forest ecosystem value data indicates that the 13 individual forest ecosystem values may not be significantly combined to produce a smaller number of groups of values that together better explain variance in the data than individual values. This finding lends support to the idea that the ecosystem values are indeed exclusive of each other; that is, they do not duplicate the same basic value.

## Survey Summary

Considering this survey data and assuming that the respondents were representative of the general public, several broad conclusions may serve as useful "sideboards" for the 2000 forest plan:

- A significant portion of the public is interested in how the CNF is managed and wishes to be involved as a partner in its planning.
- Major conceptual changes to the current forest management situation are probably not warranted, although some specific changes appear to be desired.
- Community residents appreciate the amenity values, such as recreation, life support, and aesthetic values, of CNF more than the commodity values more traditionally examined in forest planning.

## "Your Community's Quality of Life and Future" Survey

This summary of results will focus on those survey elements that may be important to CNF managers in terms of both understanding the underlying characteristics of the communities of interest as well as understanding potential effects their land management activities may have on these communities. We begin with a discussion of what the word "community" means as well as how the communities believe local and national interests should be weighted in forest planning. This is followed by community importance and satisfaction ratings of 30 preselected quality-of-life elements, with a focus on the elements over which the CNF has the most influence. Next, we discuss similar rankings of the importance of, and satisfaction with, 19 preselected public land uses or opportunities by community. Community preferences for changes in various economic sectors are then presented, with the discussion again focusing on those sectors that are potentially more influenced by CNF management activities. In the next section, the results of the perceptions of residents about selected community characteristics thought to be important in determining community resiliency are presented along with various summary measures of quality of life and community resiliency. Finally, the results of two questions concerning changes in the desirability of communities and preferences of residents for staying in their communities are discussed.

**Table 42—Importance of forest ecosystem values by community**

| Ecosystem value[a] | Anchorage (n=79) | Cooper Landing (n=65) | Cordova (n=79) | Girdwood (n=80) | Hope (n=27) | Kenai (n=72) | Moose Pass (n=40) | Seward (n=74) | Soldotna (n=79) | Sterling (n=87) | Valdez (n=61) | Whittier (n=24) | Forest-wide (n=752) | Other Alaska communities (n=63) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | | |
| Recreation | 17.5 | 13.4 | 11.2 | 12.8 | 8.1 | 18.5 | 13.1 | 12.9 | 16.7 | 20.6 | 14.7 | 9.3 | 14.9 | 16.4 |
| | (14-21) | (10-17) | (9-13) | (10-15) | (5-11) | (14-23) | (7-19) | (9-16) | (13-20) | (16-25) | (11-18) | (3-15) | (14-16) | (11-22) |
| Life support | 15.5 | 14.1 | 10.5 | 14.2 | 12.8 | 11.3 | 14.4 | 15.1 | 13.4 | 11.4 | 15.4 | 14.8 | 13.5 | 13.3 |
| | (12-19) | (11-17) | (8-13) | (10-18) | (8-17) | (8-14) | (10-19) | (12-18) | (10-17) | (9-14) | (11-20) | (7-23) | (12-14) | (9-18) |
| Aesthetic | 12.4 | 12.0 | 12.4 | 12.7 | 12.0 | 14.1 | 15.4 | 13.1 | 12.0 | 10.4 | 11.4 | 10.7 | 12.4 | 16.4 |
| | (10-15) | (9-15) | (10-15) | (10-15) | (8-16) | (11-17) | (11-20) | (10-16) | (9-15) | (8-13) | (9-14) | (4-17) | (12-13) | (12-21) |
| Biological diversity | 9.7 | 15.1 | 12.4 | 11.8 | 10.4 | 11.1 | 8.2 | 9.9 | 11.0 | 11.1 | 10.9 | 6.3 | 11.0 | 9.3 |
| | (8-12) | (12-18) | (9-15) | (8-15) | (7-14) | (9-14) | (6-10) | (7-12) | (9-13) | (9-14) | (8-13) | (3-9) | (10-12) | (7-11) |
| Future | 10.5 | 8.5 | 8.3 | 9.2 | 7.0 | 8.2 | 6.7 | 8.1 | 9.0 | 8.8 | 10.9 | 12.0 | 8.9 | 9.9 |
| | (8-13) | (6-11) | (6-11) | (7-11) | (4-10) | (6-11) | (4-9) | (6-10) | (6-12) | (6-12) | (8-14) | (3-21) | (8-10) | (7-13) |
| Economic | 8.0 | 8.2 | 8.1 | 6.1 | 7.5 | 8.0 | 5.5 | 7.0 | 8.1 | 10.8 | 5.8 | 14.5 | 7.9 | 6.9 |
| | (5-10) | (5-11) | (5-11) | (4-9) | (2-13) | (4-12) | (3-8) | (4-10) | (5-12) | (8-14) | (4-8) | (6-23) | (7-9) | (4-10) |
| Subsistence | 2.5 | 6.6 | 13.5 | 3.7 | 12.3 | 6.4 | 14.9 | 8.2 | 6.8 | 9.5 | 8.0 | 8.4 | 7.8 | 7.3 |
| | (1-4) | (4-9) | (11-16) | (2-5) | (4-21) | (3-9) | (8-22) | (5-12) | (5-9) | (6-13) | (5-11) | (3-14) | (7-9) | (4-10) |
| Therapeutic | 5.6 | 4.1 | 4.1 | 5.4 | 6.4 | 5.9 | 4.3 | 6.4 | 5.4 | 3.8 | 5.9 | 3.0 | 5.1 | 3.6 |
| | (4-8) | (3-5) | (3-5) | (4-7) | (2-11) | (4-8) | (3-6) | (5-8) | (4-7) | (2-5) | (4-8) | (1-5) | (5-6) | (2-5) |
| Intrinsic | 5.8 | 5.6 | 4.3 | 6.8 | 6.3 | 3.1 | 2.8 | 4.5 | 3.9 | 3.9 | 4.8 | 3.0 | 4.7 | 5.6 |
| | (4-8) | (3-8) | (3-6) | (4-10) | (3-9) | (2-4) | (1-4) | (3-6) | (2-6) | (2-5) | (3-7) | (0-6) | (4-5) | (2-9) |
| Spiritual | 3.4 | 3.6 | 4.4 | 6.0 | 6.1 | 5.2 | 3.6 | 6.1 | 2.6 | 2.0 | 2.3 | 4.5 | 4.0 | 3.2 |
| | (2-5) | (2-5) | (2-6) | (4-8) | (2-10) | (3-8) | (2-6) | (4-8) | (1-4) | (1-3) | (1-4) | (1-8) | (3-5) | (1-5) |
| Learning | 3.5 | 4.1 | 4.5 | 5.5 | 5.3 | 4.1 | 2.9 | 3.8 | 3.8 | 3.0 | 4.1 | 2.9 | 4.0 | 4.8 |
| | (2-5) | (3-5) | (3-6) | (4-7) | (3-8) | (3-5) | (1-5) | (3-5) | (3-5) | (2-4) | (3-6) | (1-4) | (3.6-4.4) | (3-7) |
| Historic | 4.5 | 3.1 | 2.5 | 4.2 | 3.5 | 2.3 | 3.1 | 3.2 | 3.4 | 2.8 | 3.7 | 2.4 | 3.3 | 1.8 |
| | (2-7) | (2-4) | (1-4) | (1-7) | (2-5) | (1-3) | (2-5) | (2-4) | (2-5) | (2-4) | (2-6) | (0-5) | (3-4) | (1-3) |
| Cultural | 1.6 | 1.6 | 3.4 | 2.5 | 2.3 | 1.5 | 2.5 | 1.8 | 2.5 | 1.6 | 1.9 | 6.0 | 2.2 | 1.5 |
| | (1-3) | (1-3) | (2-5) | (1-4) | (0-4) | (1-2) | (1-4) | (1-3) | (1-4) | (1-3) | (1-3) | (3-15) | (2-3) | (0-2) |

[a] Mean values were specified as a portion of $100 total. Therefore, means also may be considered as percentages.
Source: Crone 1999a.

## "Community" Definition and Preference for Weighting Interests in Planning

Table 43 shows responses of residents to the question of which definition of "community" makes the most sense for their community. In every community the definition chosen most often was "common geographical area." Girdwood, Cooper Landing, and Hope had the largest percentages of respondents choosing the definition "common values, attitudes, and lifestyles," whereas Cordova and Seward had the largest percentages of respondents choosing the definition, "common livelihood."

Another survey question asked respondents what interests should be considered in public land use planning near their community. Table 44 reveals that in most communities, the majority of respondents felt that local community interests should be given more attention than national interests. In Whittier, Cooper Landing, and Anchorage, however, the response chosen most often was for local and national interests to be equally balanced.

## Community Quality of Life

Respondents were asked to rate each of 30 quality-of-life factors in terms of its importance to their quality of life under the assumption that they could select and live in any community. The rating system ranged from 1 to 4 with 1 representing "extremely important" and 4 representing "not at all important." Table 45 lists the average rating for each factor for each community. Factors that are related to public lands or that may be directly affected by public land management decisions or activities are denoted with an asterisk. Obviously, the extent to which each factor is related to public lands or affected by public land management activities differs across factors and locations. For simplicity, we refer to these factors as public land factors or PLFs.

In three communities, two out of the five highest ranked factors were PLFs. In eight of the communities, three out of the five highest ranked factors were in this category, and in one community, Cordova, four out of the five highest ranked quality-of-life factors were PLFs. These results suggest that the high degree of interest in CNF management decisions (as discussed in the analysis of the first survey above) may stem from the importance of public lands to quality of life. Taking the average across all 12 of the CNF communities, the three most important PLFs were clean air and water, the beauty of the surrounding area, and open undeveloped areas. The three lowest ranked PLFs were subsistence gathering, subsistence hunting and fishing, and sport hunting and fishing.

For the same 30 quality-of-life factors, respondents were asked to rate their level of satisfaction with each element in their community. This rating system ranged from 1 to 5 with 1 representing "very satisfied" and 5 representing "very unsatisfied." Average satisfaction ratings for each factor in each community are shown in table 46. Because these ratings differ by community, it is difficult to make broad statements about satisfaction levels. As to the quality-of-life factors influenced by public lands, however, respondents from the communities around the CNF seem most satisfied with the beauty of the surrounding area, the clean air and water, and the open, undeveloped areas. They seem least satisfied with the roads/transportation system, access to and use of public lands, and subsistence hunting and fishing.

In table 47, differences between average satisfaction ratings and average importance ratings for the public land influenced quality-of-life factors are shown.[6] The largest average differences for all CNF respondents occurred for job and employment opportunities, the roads/transportation system, and clean air/water. If we examine this difference on a community basis and then take the average across communities, the same three factors in the same order top the list. These differences vary across communities, so to analyze the impacts of CNF management activities on the quality of life in communities nearest the

[6] The importance ratings for each respondent were rescaled from a 1 to 4 scale to a 1 to 5 scale for consistency with the satisfaction rating scale of 1 to 5.

**Table 43—Preference for definition of the word "community" by community**

| Definition | Anchorage (n=50) | Cooper Landing (n=46) | Cordova (n=56) | Girdwood (n=58) | Hope (n=18) | Kenai (n=46) | Moose Pass (n=22) | Seward (n=52) | Soldotna (n=51) | Sterling (n=36) | Valdez (n=47) | Whittier (n=19) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Percent (and 95 percent confidence interval)* | | | | | | | | | | | | |
| Common cultural heritage | 0 | 0 | 2 (0-12) | 0 | 0 | 0 | 0 | 0 | 2 (0-13) | 0 | 0 | 0 | 0 |
| Common geographical area | 90 (74-97) | 57 (36-74) | 41 (24-58) | 55 (38-70) | 67 (34-88) | 46 (27-64) | 77 (47-93) | 54 (35-70) | 59 (39-75) | 78 (56-91) | 47 (28-65) | 58 (26-82) | 61 |
| Common livelihood | 4 (0-16) | 2 (0-14) | 36 (19-53) | 0 | 0 | 11 (2-26) | 0 | 19 (7-36) | 2 (0-13) | 0 | 11 (2-26) | 11 (0-38) | 8 |
| Common political boundary | 6 (0-19) | 7 (0-21) | 7 (1-20) | 3 (0-14) | 6 (0-31) | 35 (18-53) | 5 (0-26) | 13 (4-29) | 24 (10-41) | 6 (0-21) | 19 (7-36) | 26 (5-56) | 13 |
| Common values/ attitudes/lifestyles | 0 | 35 (18-53) | 14 (4-29) | 41 (26-57) | 28 (6-57) | 9 (1-24) | 18 (3-44) | 13 (4-29) | 14 (4-30) | 17 (4-36) | 23 (9-41) | 5 (0-30) | 18 |

Source: Crone 1999b.

**Table 44—Preference for whose interests should take precedence in public land use planning, by community**

| Interests | Anchorage (n=49) | Cooper Landing (n=51) | Cordova (n=57) | Girdwood (n=59) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=23) | Seward (n=57) | Soldotna (n=59) | Sterling (n=37) | Valdez (n=45) | Whittier (n=19) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Percent (and 95 percent confidence interval)* | | | | | | | |
| Local only | **12** (3-28) | **12** (3-26) | **12** (3-26) | **14** (4-28) | **0** | **10** (2-26) | **9** (0-31) | **9** (2-22) | **10** (2-24) | **8** (1-25) | **7** (1-20) | **11** (0-38) | **9** |
| More to local | **39** (21-57) | **39** (23-56) | **58** (40-73) | **51** (33-67) | **67** (36-88) | **56** (36-73) | **65** (36-85) | **44** (27-60) | **59** (41-75) | **59** (36-78) | **53** (34-70) | **32** (8-61) | **52** |
| Balance local and national | **47** (28-65) | **49** (31-66) | **26** (13-43) | **34** (19-50) | **33** (10-61) | **29** (14-47) | **26** (7-52) | **42** (25-59) | **27** (13-44) | **27** (10-48) | **40** (22-58) | **53** (22-79) | **36** |
| More to national | **2** (0-13) | **0** | **4** (0-14) | **2** (0-11) | **0** | **4** (0-17) | **0** | **5** (0-17) | **2** (0-11) | **5** (0-21) | **0** | **0** | **2** |
| National only | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **2** (0-11) | **0** | **0** | **5** (0-30) | **1** |

Source: Crone 1999b.

**Table 45—Importance of quality of life factors by community**

| Factors[a] | Anchorage (n=52) | Cooper Landing (n=51) | Cordova (n=57) | Girdwood (n=62) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=24) | Seward (n=59) | Soldotna (n=60) | Sterling (n=38) | Valdez (n=49) | Whittier (n=20) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 1= "extremely important" to 4 = "not at all important"* | | | | | | | | | | | | |
| *Access/use of nearby public lands | 1.9 | 1.8 | 1.7 | 1.8 | 1.8 | 2.0 | 1.8 | 1.8 | 1.9 | 1.9 | 2.0 | 1.7 | 1.8 |
| *Beauty of surrounding area | 1.5 | 1.2 | 1.3 | 1.2 | 1.3 | 1.4 | 1.2 | 1.2 | 1.4 | 1.6 | 1.4 | 1.3 | 1.3 |
| *Clean air/water | 1.3 | 1.2 | 1.2 | 1.2 | 1.3 | 1.5 | 1.2 | 1.2 | 1.2 | 1.3 | 1.2 | 1.3 | 1.3 |
| *Job/employment opportunities | 1.5 | 2.5 | 1.7 | 2.3 | 3.2 | 1.5 | 2.4 | 1.7 | 1.8 | 2.1 | 1.4 | 1.5 | 2.0 |
| *Local recreational trails | 1.8 | 1.7 | 1.9 | 1.6 | 1.8 | 2.2 | 1.8 | 1.6 | 2.0 | 2.6 | 1.9 | 1.9 | 1.9 |
| *Open, undeveloped areas | 1.5 | 1.4 | 1.3 | 1.4 | 1.3 | 1.8 | 1.3 | 1.4 | 1.7 | 1.7 | 1.6 | 1.6 | 1.5 |
| *Roads/transportation system | 1.9 | 1.8 | 2.3 | 2.2 | 2.3 | 1.8 | 2.1 | 1.9 | 1.9 | 1.9 | 1.8 | 2.1 | 2.0 |
| *Sport hunting/fishing | 2.6 | 2.1 | 1.9 | 2.9 | 2.6 | 2.4 | 2.0 | 2.3 | 2.2 | 1.8 | 2.3 | 2.0 | 2.3 |
| *Subsistence gathering | 3.2 | 2.9 | 1.9 | 3.1 | 2.5 | 2.9 | 2.6 | 2.5 | 2.8 | 2.7 | 2.9 | 2.3 | 2.7 |
| *Subsistence hunting/fishing | 3.0 | 2.9 | 1.8 | 3.2 | 2.6 | 2.8 | 2.5 | 2.4 | 2.8 | 2.7 | 2.7 | 2.0 | 2.6 |
| Art/cultural events | 2.4 | 2.9 | 2.7 | 2.7 | 3.2 | 2.8 | 3.3 | 2.6 | 2.8 | 3.4 | 2.9 | 2.8 | 2.9 |
| Business opportunities | 2.1 | 2.5 | 2.1 | 2.4 | 3.2 | 2.0 | 2.6 | 2.1 | 2.1 | 2.5 | 2.0 | 1.9 | 2.3 |
| Church/spiritual groups | 2.7 | 2.6 | 2.6 | 3.1 | 3.4 | 2.4 | 3.1 | 2.4 | 2.3 | 2.4 | 2.4 | 2.8 | 2.7 |
| College/university nearby | 2.3 | 3.2 | 2.8 | 3.2 | 3.1 | 2.5 | 3.3 | 2.9 | 2.3 | 3.3 | 2.5 | 3.2 | 2.9 |
| Community events/gatherings | 2.8 | 2.3 | 2.4 | 2.6 | 2.6 | 2.7 | 2.3 | 2.4 | 2.8 | 3.2 | 2.8 | 2.5 | 2.6 |
| Developed parks | 2.2 | 2.4 | 2.6 | 2.4 | 3.2 | 2.4 | 3.0 | 2.1 | 2.2 | 2.9 | 2.4 | 2.3 | 2.5 |
| Diverse and affordable housing | 1.6 | 2.5 | 1.7 | 2.2 | 3.2 | 1.7 | 2.5 | 1.7 | 2.0 | 2.5 | 1.6 | 1.4 | 2.1 |
| Diverse and affordable shopping | 2.1 | 2.9 | 2.4 | 3.0 | 3.3 | 1.8 | 3.0 | 2.2 | 2.0 | 2.3 | 2.1 | 2.1 | 2.4 |

**Table 45—Importance of quality of life factors by community (continued)**

| Factors[a] | Anchorage (n=52) | Cooper Landing (n=51) | Cordova (n=57) | Girdwood (n=62) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=24) | Seward (n=59) | Soldotna (n=60) | Sterling (n=38) | Valdez (n=49) | Whittier (n=20) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 1= "extremely important" to 4 = "not at all important"* | | | | | | | | | | | | |
| Diverse ethnic populations | 2.9 | 3.4 | 2.9 | 3.3 | 3.5 | 3.0 | 3.3 | 2.9 | 2.9 | 3.5 | 3.0 | 3.0 | 3.1 |
| Entertainment | 2.4 | 2.8 | 2.8 | 2.7 | 3.5 | 2.7 | 3.3 | 2.7 | 2.8 | 3.3 | 2.8 | 2.7 | 2.9 |
| Good health care/hospitals | 2.0 | 2.4 | 2.0 | 2.6 | 2.7 | 1.9 | 2.6 | 1.9 | 1.8 | 2.4 | 1.8 | 2.1 | 2.2 |
| Living near family/friends | 2.4 | 2.4 | 2.3 | 2.6 | 2.7 | 2.3 | 2.5 | 2.4 | 2.2 | 2.4 | 2.2 | 2.6 | 2.4 |
| Planning/zoning regulations | 2.2 | 2.2 | 2.6 | 2.0 | 3.4 | 2.5 | 2.9 | 2.2 | 2.4 | 3.2 | 2.4 | 2.4 | 2.5 |
| Programs/activities for youth | 2.1 | 2.5 | 2.1 | 2.3 | 2.7 | 2.2 | 2.3 | 2.0 | 1.8 | 2.7 | 2.1 | 1.7 | 2.2 |
| Property/local tax rates | 1.7 | 2.1 | 1.9 | 2.1 | 2.1 | 1.8 | 2.1 | 1.9 | 1.8 | 1.9 | 1.8 | 1.9 | 1.9 |
| Quality of public schools | 1.8 | 2.0 | 1.9 | 2.2 | 2.2 | 1.8 | 1.7 | 1.9 | 1.8 | 2.4 | 1.8 | 1.7 | 1.9 |
| Responsive local government | 1.9 | 2.0 | 1.9 | 1.9 | 2.8 | 2.0 | 2.3 | 1.9 | 1.7 | 2.3 | 2.0 | 1.5 | 2.0 |
| Safety, low crime rate | 1.6 | 1.5 | 1.4 | 1.4 | 1.5 | 1.4 | 1.3 | 1.5 | 1.4 | 1.5 | 1.4 | 1.2 | 1.4 |
| Size/growth of community | 2.4 | 2.0 | 2.1 | 1.7 | 2.6 | 2.0 | 2.4 | 1.9 | 2.2 | 2.5 | 2.2 | 1.9 | 2.2 |
| Trustworthy neighbors | 1.5 | 1.4 | 1.6 | 1.4 | 1.8 | 1.6 | 1.3 | 1.4 | 1.7 | 1.3 | 1.6 | 1.4 | 1.5 |

[a] * = Factors that are related to public lands or that may be directly affected by public land management decisions or activities.
Source: Crone 1999b.

**Table 46—Satisfaction with quality of life factors by community**

| Factors[a] | Anchorage (n=52) | Cooper Landing (n=51) | Cordova (n=57) | Girdwood (n=62) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=24) | Seward (n=59) | Soldotna (n=60) | Sterling (n=38) | Valdez (n=49) | Whittier (n=20) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 1= "very satisfied" to 5 = "very unsatisfied"* | | | | | | | | | | | | |
| *Access/use of nearby public lands | 2.7 | 2.1 | 2.5 | 2.0 | 1.8 | 2.6 | 2.0 | 2.5 | 2.8 | 3.1 | 2.6 | 2.8 | 2.5 |
| *Beauty of surrounding area | 2.0 | 1.1 | 1.2 | 1.3 | 1.3 | 1.7 | 1.2 | 1.3 | 1.9 | 1.6 | 1.3 | 1.5 | 1.4 |
| *Clean air/water | 2.5 | 1.2 | 1.6 | 1.6 | 1.5 | 2.1 | 1.3 | 1.8 | 2.0 | 1.6 | 2.6 | 1.3 | 1.8 |
| *Job/employment opportunities | 2.2 | 3.1 | 2.8 | 2.7 | 3.1 | 2.8 | 3.0 | 2.7 | 3.2 | 2.9 | 2.7 | 3.4 | 2.9 |
| *Local recreational trails | 2.0 | 1.5 | 1.6 | 1.7 | 1.7 | 2.4 | 1.7 | 2.2 | 2.4 | 2.5 | 2.2 | 2.6 | 2.0 |
| *Open, undeveloped areas | 2.5 | 1.4 | 1.4 | 1.6 | 1.4 | 2.3 | 1.6 | 2.0 | 2.1 | 2.0 | 2.2 | 2.0 | 1.9 |
| *Roads/transportation system | 2.8 | 2.6 | 2.9 | 2.6 | 2.4 | 3.0 | 2.5 | 2.6 | 3.0 | 2.9 | 2.5 | 4.1 | 2.8 |
| *Sport hunting/fishing | 2.7 | 2.0 | 1.8 | 2.5 | 2.5 | 2.7 | 2.2 | 2.5 | 2.6 | 2.6 | 2.4 | 2.1 | 2.4 |
| *Subsistence gathering | 2.9 | 2.4 | 1.9 | 2.6 | 2.4 | 2.8 | 2.0 | 2.8 | 2.8 | 2.7 | 2.8 | 2.7 | 2.6 |
| *Subsistence hunting/fishing | 2.9 | 2.6 | 1.9 | 2.7 | 2.6 | 2.9 | 2.6 | 2.9 | 2.8 | 2.9 | 2.7 | 2.6 | 2.7 |
| Art/cultural events | 2.1 | 2.9 | 2.7 | 2.8 | 3.0 | 2.9 | 3.0 | 2.7 | 2.9 | 2.7 | 2.7 | 3.6 | 2.8 |
| Business opportunities | 2.4 | 2.8 | 2.9 | 2.9 | 3.1 | 2.8 | 2.6 | 3.0 | 3.1 | 2.7 | 3.3 | 3.4 | 2.9 |
| Church/spiritual groups | 2.3 | 2.4 | 2.2 | 2.6 | 2.9 | 2.3 | 2.3 | 2.3 | 2.3 | 2.1 | 2.5 | 3.2 | 2.4 |
| College/university nearby | 2.3 | 2.8 | 2.4 | 2.6 | 3.2 | 2.5 | 3.0 | 3.1 | 2.4 | 2.3 | 2.5 | 3.6 | 2.7 |
| Community events/gatherings | 2.2 | 1.7 | 2.2 | 2.3 | 2.3 | 2.6 | 2.1 | 2.6 | 2.9 | 2.6 | 2.6 | 3.1 | 2.4 |
| Developed parks | 2.3 | 2.1 | 2.5 | 2.3 | 2.7 | 2.2 | 2.7 | 2.9 | 2.4 | 2.9 | 2.5 | 4.1 | 2.6 |
| Diverse and affordable housing | 2.6 | 3.1 | 3.3 | 3.1 | 2.7 | 2.4 | 2.9 | 3.4 | 2.7 | 2.6 | 3.6 | 3.6 | 3.0 |

**Table 46—Satisfaction with quality of life factors by community (continued)**

| Factors[a] | Anchorage (n=52) | Cooper Landing (n=51) | Cordova (n=57) | Girdwood (n=62) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=24) | Seward (n=59) | Soldotna (n=60) | Sterling (n=38) | Valdez (n=49) | Whittier (n=20) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Scale: 1= "very satisfied" to 5 = "very unsatisfied"* | | | | | | | |
| Diverse and affordable shopping | 2.0 | 3.3 | 3.4 | 3.3 | 3.2 | 3.0 | 3.3 | 3.8 | 2.7 | 2.6 | 3.9 | 4.1 | 3.2 |
| Diverse ethnic populations | 2.3 | 2.7 | 2.3 | 2.7 | 2.7 | 2.7 | 2.2 | 2.6 | 2.8 | 2.7 | 2.7 | 2.7 | 2.6 |
| Entertainment | 2.1 | 2.6 | 2.8 | 2.8 | 3.1 | 2.7 | 2.8 | 2.7 | 2.9 | 2.6 | 3.2 | 3.7 | 2.8 |
| Good health care/hospitals | 2.0 | 2.9 | 2.4 | 2.6 | 3.4 | 2.5 | 2.8 | 2.9 | 2.3 | 2.4 | 2.9 | 3.9 | 2.8 |
| Living near family/friends | 2.2 | 2.1 | 2.1 | 2.3 | 1.9 | 2.2 | 2.4 | 2.3 | 2.3 | 2.0 | 2.6 | 2.8 | 2.3 |
| Planning/zoning regulations | 2.9 | 3.2 | 2.9 | 3.3 | 2.5 | 2.9 | 2.4 | 3.5 | 3.1 | 2.7 | 3.2 | 3.4 | 3.0 |
| Programs/activities for youth | 2.4 | 2.6 | 2.9 | 2.4 | 2.9 | 2.7 | 2.8 | 2.7 | 2.9 | 2.8 | 2.8 | 3.7 | 2.8 |
| Property/local tax rates | 3.1 | 2.5 | 3.5 | 3.1 | 2.6 | 2.7 | 2.7 | 2.9 | 3.2 | 2.9 | 3.7 | 2.9 | 3.0 |
| Quality of public schools | 2.4 | 1.7 | 2.3 | 2.5 | 2.8 | 2.6 | 2.3 | 2.6 | 2.5 | 2.8 | 2.1 | 2.3 | 2.4 |
| Responsive local government | 2.9 | 3.1 | 3.2 | 3.2 | 2.9 | 3.2 | 2.8 | 3.4 | 3.1 | 2.9 | 3.2 | 3.7 | 3.1 |
| Safety, low crime rate | 2.4 | 1.5 | 1.6 | 1.7 | 1.9 | 2.1 | 2.3 | 2.3 | 2.2 | 2.2 | 2.1 | 1.9 | 2.0 |
| Size/growth of community | 2.8 | 2.3 | 2.5 | 3.0 | 2.1 | 2.6 | 2.5 | 3.0 | 3.0 | 2.7 | 2.7 | 3.3 | 2.7 |
| Trustworthy neighbors | 2.2 | 1.4 | 1.6 | 1.7 | 1.9 | 2.0 | 2.0 | 2.1 | 2.0 | 1.8 | 2.1 | 2.2 | 1.9 |

[a] * = Factors that are related to public lands or that may be directly affected by public land management decisions or activities.
Source: Crone 1999b.

**Table 47—Difference between satisfaction and importance for public land quality-of-life factors by community**

| Factors[a] | Anchorage (n=52) | Cooper Landing (n=51) | Cordova (n=57) | Girdwood (n=62) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=24) | Seward (n=59) | Soldotna (n=60) | Sterling (n=38) | Valdez (n=49) | Whittier (n=20) | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: -4 = minimum difference to 4 = maximum difference* | | | | | | | | | | | | |
| *Access/use of nearby public lands | 0.6 | 0.1 | .5 | 0.0 | -0.3 | 0.2 | -0.1 | 0.4 | 0.7 | 1.0 | 0.3 | 0.9 | 0.4 |
| *Beauty of surrounding area | .4 | -.1 | -.2 | 0 | -.2 | .1 | -.1 | 0 | .4 | -.2 | -.2 | .1 | 0 |
| *Clean air/water | 1.2 | 0 | .3 | .3 | .1 | .5 | .1 | .5 | .8 | .2 | 1.2 | -.1 | .4 |
| *Job/employment opportunities | .6 | .1 | .9 | 0 | -.9 | 1.1 | 0 | .8 | 1.2 | .4 | 1.1 | 1.8 | .6 |
| *Local recreational trails | 0 | -.4 | -.6 | -.1 | -.4 | -.3 | -.3 | .3 | 0 | -.6 | 0 | .3 | -.2 |
| *Open, undeveloped areas | .8 | -.2 | -.1 | 0 | .1 | .2 | .2 | .4 | .2 | 0 | .3 | .2 | .2 |
| *Roads/transportation system | .6 | .5 | .2 | .1 | -.3 | 1.0 | .1 | .5 | .8 | .7 | .4 | 1.7 | .5 |
| *Sport hunting/ fishing | -.4 | -.5 | -.4 | -1.0 | -.6 | -.1 | -.2 | -.2 | 0 | .5 | -.3 | -.2 | -.3 |
| *Subsistence gathering | -1.0 | -1.2 | -.3 | -1.2 | -.6 | -.7 | -1.1 | -.3 | -.7 | -.6 | -.7 | -.1 | -.7 |
| *Subsistence hunting/fishing | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 | 0 | 0 | -1.0 | 0 | -1.0 | 0 | -1.0 |

[a] * = Factors that are related to public lands or that may be directly affected by public land management decisions or activities.
Source: Crone 1999b.

location of proposed activities, it may be important to consider the divergence between satisfaction and importance ratings for individual communities.

## Public Land Uses and Opportunities

To determine the relative importance of various public land uses (opportunities) in the quality of life of the citizens of the CNF communities of interest, respondents were asked to allocate 100 points among a list of 19 uses. Table 48 displays the average importance rating for each use (opportunity) for each community. The average importance ratings varied across communities. Taking the average of the averages for each public land use (opportunity), the uses with the highest importance ratings were clean air and water (12.3), fishing (11.9), and hiking, backpacking, and skiing trails (8.7). The uses (opportunities) with the lowest importance ratings were trapping (0.6), ATV/ORV areas (1.3), and jobs from logging and mining (1.7).

For the same 19 public land uses (opportunities), respondents were asked to rate their level of satisfaction with each use (opportunity) near their particular community. The rating scale was the same as that given above for the general quality of life factor satisfaction rating. Table 49 shows the average satisfaction ratings for each use (opportunity) for each community. Taking the average of the averages, the uses (opportunities) with the highest satisfaction ratings were scenic landscapes (1.7), and viewing wildlife (1.7). The uses (opportunities) with the lowest average satisfaction ratings were jobs from logging and mining (3.3), access for disabled people (3.1), and ATV/ORV areas (3.1).

Table 50 presents the differences between average satisfaction ratings and average importance ratings for the public land uses.[7] Fishing; clean air and water resources; and hiking, backpacking, and skiing trails show the largest differences between satisfaction and importance. Again, these differences vary across communities. To analyze quality of life impacts, it may be important to consider the divergence between satisfaction and importance ratings for individual communities.

## Economic Activity

In another survey question, respondents were asked whether they would like to see an increase, decrease, or no change in the level of economic activity in their community in each of 12 economic sectors.[8] Table 51 shows the percentage of respondents choosing each option for each sector in each community. The sectors on which forest planning decisions may have the most impact are forestry and forest products; mining, oil and gas; and tourism services. In 8 of the 12 communities, the response chosen most often was for no change in the forestry and forest products sector. In every community, a larger percentage of respondents favored an increase rather than a decrease in this sector.

For the mining sector, the response chosen most often in every community was no change. Cooper Landing, Hope, Moose Pass, and Soldotna had larger percentages of respondents favoring a decrease rather than an increase in mining activity in their communities. In the communities of Kenai, Sterling, and Soldotna, the largest percentage of respondents favored an increase in oil and gas activity in their communities, whereas in all other communities, the response chosen most often was for no change in the level of activity. Only in the communities of Moose Pass and Cooper Landing was a decrease in oil and gas activity favored more often than an increase. In 7 of the 12 communities, the response chosen most often for the fishing sector was no change. Whittier, Cordova, Kenai, and Seward each had a majority of respondents in favor of an increase in this sector, whereas in Sterling, more respondents favored a decrease.

[7] The average importance ratings for each community were converted to a 1 to 5 scale for consistency with the satisfaction scale of 1 to 5.

[8] Some of the economic sectors identified in the survey question were more detailed than the SIC classifications used earlier in this document. This was done in order to focus on the economic activity in the specific sectors most associated with forest resources, such as tourism services, forestry and forest products, commercial fishing, oil and gas, and mining.

**Table 48—Importance of public land use/opportunities by community**

| Factors | Anchorage (n=45) | Cooper Landing (n=39) | Cordova (n=46) | Girdwood (n=55) | Hope (n=16) | Kenai (n=37) | Moose Pass (n=20) | Seward (n=43) | Soldotna (n=47) | Sterling (n=28) | Valdez (n=43) | Whittier (n=14) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Percent (and 95 percent confidence interval)* | | | | | | | |
| Access for disabled people | 1.4 (1-2) | 1.0 (0-2) | 1.2 (0-2) | 0.8 (0-1) | 0.0 | 1.5 (0-3) | 2.6 (0-5) | 2.0 (1-4) | 4.4 (1-7) | 1.7 (0-4) | 2.7 (1-4) | 1.8 (0-6) | 1.8 |
| ATV/ORV areas | 0.2 (0-.5) | 0.3 (0-1) | 1.2 (0-2) | 0.5 (0-1) | 1.6 (0-3) | 1.1 (0-3) | 3.2 (0-7) | 1.3 (0-3) | 1.3 (0-3) | 1.4 (0-3) | 3.0 (1-4) | 0.0 | 1.3 |
| Campgrounds/ picnic areas | 5.7 (4-8) | 5.3 (3-8) | 3.3 (2-5) | 4.2 (3-6) | 5.0 (2-8) | 5.9 (3-9) | 1.3 (0-2) | 4.4 (3-6) | 8.0 (5-11) | 4.6 (1-9) | 4.3 (3-6) | 3.2 (0-7) | 4.6 |
| Clean air and water resources | 10.7 (7-14) | 12.4 (9-16) | 12.1 (8-16) | 12.6 (10-16) | 12.3 (6-19) | 11.9 (7-17) | 10.8 (7-15) | 10.7 (8-13) | 15.6 (11-20) | 7.8 (4-11) | 13.7 (9-18) | 16.8 (7-27) | 12.3 |
| Fishing | 10.8 (6-15) | 14.9 (9-20) | 15.0 (11-19) | 6.5 (4-9) | 7.2 (1-13) | 14.2 (9-19) | 10.6 (7-15) | 8.6 (5-12) | 13.5 (8-20) | 18.4 (11-25) | 11.1 (8-15) | 12.1 (3-22) | 11.9 |
| Hiking/backpacking/ skiing trail | 12.2 (7-17) | 7.6 (5-10) | 6.6 (4-9) | 15.2 (12-18) | 8.4 (2-15) | 8.2 (3-13) | 7.5 (3-12) | 15.5 (10-21) | 6.2 (4-9) | 3.4 (2-5) | 5.6 (3-8) | 8.2 (0-17) | 8.7 |
| Hunting | 2.9 (1-5) | 4.3 (1-7) | 9.6 (7-13) | 3.0 (1-5) | 5.0 (1-9) | 4.5 (2-7) | 8.7 (5-13) | 4.2 (1-4) | 5.8 (3-9) | 15.2 (10-20) | 8.5 (4-12) | 2.5 (0-5) | 6.2 |
| Jobs from logging/ mining | 1.5 (0-3) | 1.9 (0-5) | 2.6 (0-5) | 0.5 (0-1) | 3.4 (0-8) | 3.3 (0-8) | 1.5 (0-3) | 2.2 (0-5) | 0.6 (0-1) | 2.0 (0-4) | 0.4 (0-1) | 0.7 (0-2) | 1.7 |
| Jobs from oil/gas drilling | 8.4 (4-13) | 0.4 (0-1) | 0.5 (0-1) | 0.4 (0-1) | 0.0 | 7.7 (2-13) | 0.3 (0-1) | 0.8 (0-1) | 4.4 (1-8) | 6.0 (0-11) | 9.3 (3-15) | 0.0 | 3.2 |
| Jobs from tourism attractions | 3.4 (2-5) | 5.8 (3-8) | 1.2 (0-2) | 7.8 (5-11) | 2.8 (0-6) | 2.6 (0-6) | 5.3 (1-9) | 4.1 (1-7) | 3.1 (1-5) | 1.8 (0-3) | 3.9 (1-7) | 8.2 (2-15) | 4.2 |

**Table 48—Importance of public land use/opportunities by community (continued)**

| Factors | Anchorage (n=45) | Cooper Landing (n=39) | Cordova (n=46) | Girdwood (n=55) | Hope (n=16) | Kenai (n=37) | Moose Pass (n=20) | Seward (n=43) | Soldotna (n=47) | Sterling (n=28) | Valdez (n=43) | Whittier (n=14) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Percent (and 95 percent confidence interval)* | | | | | | | |
| Quiet areas | 4.8 | 8.1 | 3.7 | 9.5 | 7.1 | 4.8 | 6.9 | 8.2 | 4.2 | 5.1 | 4.3 | 6.8 | 6.1 |
| | (3-7) | (6-10) | (2-5) | (6-14) | (3-11) | (2-7) | (4-10) | (4-12) | (2-6) | (2-8) | (2-6) | (1-13) | |
| Roads into backcountry | 3.4 | 1.8 | 2.5 | 2.7 | 3.1 | 2.2 | 2.3 | 1.8 | 2.1 | 4.3 | 4.9 | 3.6 | 2.9 |
| | (1-6) | (0-3) | (1-4) | (1-4) | (0-5) | (1-3) | (0-5) | (1-3) | (0-4) | (0-8) | (3-7) | (0-9) | |
| Scenic drives | 6.8 | 2.7 | 3.8 | 4.1 | 4.0 | 7.5 | 2.4 | 4.8 | 3.8 | 3.8 | 2.7 | 1.1 | 4.0 |
| | (4-9) | (1-4) | (2-6) | (3-6) | (2-6) | (2-13) | (1-4) | (3-6) | (2-6) | (1-6) | (2-4) | (0-3) | |
| Scenic landscapes | 8.0 | 6.9 | 5.0 | 8.5 | 6.4 | 3.2 | 6.2 | 6.2 | 3.7 | 2.7 | 5.3 | 7.5 | 5.8 |
| | (6-10) | (5-9) | (3-7) | (6-10) | (2-11) | (1-5) | (3-10) | (4-8) | (2-5) | (1-4) | (3-8) | (2-13) | |
| Snowmachine areas | 2.3 | 4.3 | 0.8 | 2.8 | 3.4 | 2.7 | 4.9 | 2.8 | 4.3 | 3.4 | 3.4 | 2.5 | 3.1 |
| | (0-5) | (1-8) | (0-2) | (1-4) | (0-7) | (0-5) | (2-8) | (1-5) | (1-7) | (1-6) | (2-5) | (0-6) | |
| Subsistence use | 1.7 | 3.0 | 7.4 | 1.3 | 4.4 | 1.2 | 3.3 | 1.6 | 2.7 | 0.8 | 0.7 | 1.4 | 2.5 |
| | (0-3) | (0-6) | (4-11) | (0-2) | (0-9) | (0-3) | (1-6) | (1-3) | (0-5) | (0-1) | (0-1) | (0-4) | |
| Trapping | 0.3 | 0.2 | 1.5 | 0.3 | 0.6 | 0.4 | 0.5 | 0.5 | 0.3 | 2.3 | 0.2 | 0.0 | 0.6 |
| | (0-1) | (0-1) | (0-3) | (0-1) | (0-2) | (0-1) | (0-1) | (0-1) | (0-1) | (0-4) | (0-1) | | |
| Undeveloped land/wilderness | 7.6 | 10.0 | 9.1 | 10.8 | 12.4 | 5.5 | 14.5 | 7.9 | 4.5 | 7.1 | 7.1 | 6.1 | 8.6 |
| | (5-10) | (5-15) | (6-12) | (7-14) | (5-19) | (3-8) | (5-24) | (5-11) | (2-7) | (3-11) | (4-10) | (1-12) | |
| Viewing wildlife | 7.7 | 9.0 | 9.1 | 8.1 | 11.3 | 11.2 | 6.5 | 10.6 | 10.1 | 7.6 | 6.9 | 15.0 | 9.4 |
| | (4-11) | (6-12) | (7-11) | (6-10) | (3-19) | (7-16) | (4-9) | (7-14) | (7-13) | (4-11) | (4-10) | (5-25) | |

Source: Crone 1999b.

**Table 49—Satisfaction with public land uses/opportunities by community**

| Factors | Anchorage (n=47) | Cooper Landing (n=44) | Cordova (n=54) | Girdwood (n=52) | Hope (n=17) | Kenai (n=40) | Moose Pass (n=21) | Seward (n=55) | Soldotna (n=54) | Sterling (n=33) | Valdez (n=42) | Whittier (n=17) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 1= "very satisfied" to 5 = "very unsatisfied"* | | | | | | | | | | | | |
| Access for disabled people | 3.3 | 2.6 | 3.1 | 2.9 | 3.3 | 2.7 | 2.9 | 3.0 | 3.1 | 3.1 | 3.7 | 3.9 | 3.1 |
| ATV/ORV areas | 3.1 | 2.4 | 3.0 | 3.1 | 2.9 | 3.4 | 3.1 | 3.2 | 3.0 | 3.5 | 3.5 | 2.7 | 3.1 |
| Campgrounds/picnic areas | 2.5 | 1.7 | 2.4 | 2.7 | 1.7 | 2.2 | 2.0 | 2.3 | 2.6 | 3.1 | 2.8 | 3.3 | 2.4 |
| Clean air and water resources | 2.3 | 1.6 | 1.6 | 1.5 | 1.5 | 2.3 | 1.5 | 2.0 | 2.6 | 1.9 | 2.5 | 1.2 | 1.9 |
| Fishing | 2.4 | 2.0 | 1.7 | 2.2 | 1.8 | 2.4 | 2.1 | 2.1 | 2.7 | 2.9 | 1.7 | 1.8 | 2.1 |
| Hiking/backpacking/ skiing trail | 1.9 | 1.7 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 | 1.8 | 2.2 | 2.3 | 2.3 | 2.4 | 1.9 |
| Hunting | 2.5 | 2.2 | 1.7 | 2.6 | 2.5 | 3.1 | 2.1 | 2.6 | 2.9 | 2.7 | 2.8 | 1.7 | 2.4 |
| Jobs from logging, mining | 2.9 | 3.2 | 3.3 | 3.0 | 3.3 | 3.8 | 3.2 | 4.0 | 3.2 | 3.1 | 3.7 | 3.3 | 3.3 |
| Jobs from oil/gas drilling | 2.9 | 2.6 | 2.9 | 2.8 | 3.2 | 3.1 | 3.0 | 3.5 | 3.1 | 2.7 | 2.2 | 3.0 | 2.9 |
| Jobs from tourism attractions | 2.7 | 1.9 | 2.9 | 2.3 | 2.5 | 2.9 | 2.4 | 2.2 | 2.6 | 2.8 | 2.6 | 2.7 | 2.5 |
| Quiet areas | 2.4 | 1.7 | 1.5 | 1.9 | 1.6 | 2.0 | 1.9 | 2.0 | 2.5 | 2.4 | 2.3 | 1.5 | 2.0 |
| Roads into backcountry | 3.2 | 2.9 | 2.3 | 2.6 | 2.2 | 2.7 | 2.9 | 2.9 | 3.4 | 3.5 | 3.4 | 4.0 | 3.0 |
| Scenic drives | 1.9 | 1.9 | 1.8 | 1.8 | 1.6 | 2.1 | 1.9 | 2.0 | 2.3 | 2.3 | 2.2 | 3.7 | 2.1 |
| Scenic landscapes | 1.8 | 1.5 | 1.3 | 1.4 | 1.5 | 2.0 | 1.5 | 1.6 | 2.2 | 2.1 | 1.6 | 1.9 | 1.7 |
| Snowmachine areas | 2.8 | 2.2 | 2.6 | 3.1 | 2.4 | 2.5 | 2.5 | 2.3 | 2.6 | 2.6 | 2.2 | 2.2 | 2.5 |
| Subsistence use | 2.9 | 2.7 | 2.0 | 3.2 | 2.5 | 2.9 | 3.5 | 3.1 | 2.7 | 3.2 | 2.9 | 2.8 | 2.9 |
| Trapping | 2.8 | 1.9 | 2.1 | 2.7 | 2.9 | 2.9 | 2.7 | 2.7 | 2.7 | 3.1 | 3.0 | 2.5 | 2.7 |
| Undeveloped land/wilderness | 2.2 | 1.6 | 1.5 | 1.8 | 1.5 | 2.5 | 2.0 | 2.1 | 2.3 | 2.2 | 2.0 | 1.5 | 1.9 |
| Viewing wildlife | 1.9 | 1.5 | 1.5 | 1.6 | 1.6 | 1.8 | 1.5 | 1.6 | 2.0 | 1.8 | 1.9 | 1.5 | 1.7 |

Source: Crone 1999b.

**Table 50—Difference between satisfaction and importance for public land uses and opportunities by community**

| Factors | Anchorage (n=47) | Cooper Landing (n=44) | Cordova (n=54) | Girdwood (n=52) | Hope (n=17) | Kenai (n=40) | Moose Pass (n=21) | Seward (n=55) | Soldotna (n=54) | Sterling (n=33) | Valdez (n=42) | Whittier (n=17) | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: -4 = minimum difference to 4 = maximum difference* | | | | | | | | | | | | |
| Access for disabled people | -1.4 | -2.2 | -1.7 | -1.2 | -1.7 | -2.0 | -1.6 | -1.6 | -0.9 | -1.6 | -0.8 | -0.7 | -1.5 |
| ATV/ORV areas | -1.9 | -2.5 | -1.7 | -1.0 | -1.8 | -1.3 | -1.2 | -1.5 | -1.7 | -1.2 | -.8 | -2.3 | -1.6 |
| Campgrounds/picnic areas | -1.3 | -2.2 | -1.9 | -1.0 | -2.2 | -1.5 | -2.7 | -1.8 | -.6 | -.9 | -1.3 | -1.0 | -1.6 |
| Clean air and water resources | -.3 | -.7 | -.7 | -1.1 | -.8 | -.2 | -1.1 | -.7 | 1.0 | -1.4 | .4 | -.2 | -.4 |
| Fishing | -.3 | .2 | -.1 | -.8 | -1.7 | .5 | -.6 | -1.0 | .7 | 1.9 | -.9 | -.6 | -.3 |
| Hiking/backpacking/ skiing trail | -.4 | -1.6 | -2.0 | -.9 | -1.5 | -1.5 | -1.5 | .2 | -1.4 | -1.9 | -1.5 | -.8 | -1.2 |
| Hunting | -1.9 | -1.8 | -1.2 | -.6 | -1.4 | -.9 | -1.1 | -1.4 | -.9 | 1.0 | -.4 | -2.8 | -1.2 |
| Jobs from logging, mining | -1.7 | -1.4 | -1.2 | -.8 | -1.0 | -.5 | -1.5 | -.6 | -1.7 | -1.5 | -1.2 | -1.5 | -1.3 |
| Jobs from oil/gas drilling | -.3 | -2.3 | -2.0 | -1.3 | -1.8 | -.2 | -1.9 | -1.3 | -.9 | -1.0 | -.8 | -2.0 | -1.4 |
| Jobs from tourism attractions | -1.6 | -1.8 | -1.8 | -.4 | -1.9 | -1.5 | -1.4 | -1.9 | -1.7 | -1.8 | -1.6 | -.5 | -1.5 |
| Quiet areas | -1.5 | -1.6 | -2.7 | -1.1 | -1.9 | -2.0 | -1.6 | -1.2 | -1.6 | -1.5 | -1.8 | -2.0 | -1.7 |
| Roads into backcountry | -1.1 | -1.7 | -2.2 | -1.1 | -2.1 | -1.8 | -1.6 | -1.7 | -1.1 | -.6 | -.6 | -.2 | -1.4 |
| Scenic drives | -1.6 | -2.5 | -2.4 | -1.9 | -2.5 | -1.2 | -2.6 | -1.9 | -1.9 | -1.9 | -2.2 | -1.0 | -2.0 |
| Scenic landscapes | -1.4 | -2.0 | -2.6 | -1.8 | -2.1 | -2.3 | -2.2 | -2.1 | -2.0 | -2.3 | -2.3 | -1.4 | -2.0 |
| Snowmachine areas | -1.8 | -1.9 | -2.2 | -.3 | -1.8 | -1.9 | -1.4 | -2.0 | -1.5 | -1.7 | -2.0 | -2.2 | -1.8 |
| Subsistence use | -1.7 | -1.6 | -1.4 | -.3 | -1.5 | -1.8 | -.7 | -1.5 | -1.7 | -1.6 | -1.9 | -1.9 | -1.6 |
| Trapping | -2.1 | -3.0 | -2.6 | -1.2 | -2.0 | -2.0 | -2.2 | -2.2 | -2.2 | -1.4 | -1.9 | -2.5 | -2.2 |
| Undeveloped land/wilderness | -1.2 | -1.2 | -1.5 | -1.1 | -.8 | -1.3 | .2 | -1.1 | -1.7 | -1.3 | -1.4 | -2.2 | -1.2 |
| Viewing wildlife | -1.5 | -1.6 | -1.6 | -1.7 | -1.0 | -.7 | -2.1 | -1.0 | -.8 | -1.5 | -1.6 | -.2 | -1.3 |

Source: Crone 1999b.

**Table 51—Preference for change in local economic sectors by community**

| Economic sector | | Anchorage (n=49) | Cooper Landing (n=48) | Cordova (n=57) | Girdwood (n=61) | Hope (n=16) | Kenai (n=46) | Moose Pass (n=22) | Seward (n=59) | Soldotna (n=58) | Sterling (n=37) | Valdez (n=48) | Whittier (n=19) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | *Percent* | | | | | | |
| Forestry/forest products | Decrease | 18 | 15 | 32 | 14 | 13 | 11 | 18 | 10 | 14 | 22 | 27 | 21 | 18 |
| | No change | 45 | 50 | 30 | 66 | 53 | 46 | 45 | 36 | 34 | 30 | 44 | 53 | 44 |
| | Increase | 37 | 35 | 38 | 21 | 33 | 43 | 36 | 53 | 52 | 49 | 29 | 26 | 38 |
| Mining | Decrease | 15 | 33 | 18 | 10 | 38 | 9 | 27 | 15 | 21 | 17 | 11 | 13 | 19 |
| | No change | 54 | 59 | 59 | 78 | 44 | 67 | 59 | 69 | 61 | 46 | 53 | 56 | 59 |
| | Increase | 31 | 9 | 23 | 12 | 19 | 24 | 14 | 15 | 18 | 37 | 36 | 31 | 22 |
| Commercial fishing | Decrease | 18 | 35 | 5 | 17 | 25 | 26 | 23 | 20 | 29 | 44 | 10 | 5 | 22 |
| | No change | 59 | 60 | 30 | 79 | 75 | 33 | 73 | 39 | 38 | 39 | 50 | 21 | 50 |
| | Increase | 22 | 5 | 65 | 3 | 0 | 41 | 5 | 41 | 33 | 17 | 40 | 74 | 29 |
| Construction | Decrease | 12 | 6 | 11 | 13 | 13 | 13 | 14 | 17 | 18 | 22 | 10 | 0 | 12 |
| | No change | 51 | 43 | 38 | 56 | 63 | 37 | 59 | 40 | 49 | 43 | 42 | 11 | 44 |
| | Increase | 37 | 51 | 51 | 31 | 25 | 50 | 27 | 43 | 33 | 35 | 48 | 89 | 43 |
| Finance/ insurance/real estate | Decrease | 18 | 9 | 4 | 12 | 0 | 13 | 5 | 5 | 9 | 20 | 4 | 6 | 9 |
| | No change | 55 | 80 | 88 | 63 | 100 | 65 | 90 | 75 | 83 | 66 | 77 | 24 | 72 |
| | Increase | 27 | 11 | 9 | 25 | 0 | 22 | 5 | 20 | 9 | 14 | 19 | 71 | 19 |
| Government | Decrease | 37 | 28 | 23 | 25 | 25 | 39 | 38 | 24 | 48 | 62 | 44 | 33 | 36 |
| | No change | 59 | 67 | 63 | 68 | 69 | 50 | 52 | 64 | 45 | 35 | 44 | 27 | 54 |
| | Increase | 4 | 4 | 14 | 7 | 6 | 11 | 10 | 12 | 7 | 3 | 13 | 40 | 11 |
| Manufacturing | Decrease | 6 | 11 | 5 | 12 | 7 | 7 | 9 | 5 | 3 | 12 | 8 | 6 | 8 |
| | No change | 29 | 75 | 48 | 71 | 93 | 29 | 64 | 51 | 31 | 35 | 50 | 67 | 54 |
| | Increase | 65 | 14 | 46 | 17 | 0 | 64 | 27 | 44 | 66 | 53 | 42 | 28 | 39 |

**Table 51—Preference for change in local economic sectors by community (continued)**

| Economic sector | | Anchorage (n=49) | Cooper Landing (n=48) | Cordova (n=57) | Girdwood (n=61) | Hope (n=16) | Kenai (n=46) | Moose Pass (n=22) | Seward (n=59) | Soldotna (n=58) | Sterling (n=37) | Valdez (n=48) | Whittier (n=19) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | *Percent* | | | | | | |
| Oil/gas | Decrease | 4 | 10 | 18 | 7 | 7 | 4 | 14 | 14 | 12 | 16 | 17 | 18 | 12 |
| | No change | 56 | 83 | 57 | 78 | 73 | 37 | 77 | 64 | 40 | 35 | 46 | 65 | 59 |
| | Increase | 40 | 7 | 25 | 16 | 20 | 59 | 9 | 22 | 48 | 49 | 38 | 18 | 29 |
| Other services | Decrease | 2 | 4 | 2 | 0 | 0 | 2 | 5 | 2 | 5 | 3 | 4 | 0 | 2 |
| | No change | 35 | 56 | 32 | 49 | 50 | 41 | 38 | 50 | 53 | 41 | 31 | 12 | 41 |
| | Increase | 63 | 40 | 66 | 51 | 50 | 57 | 57 | 48 | 41 | 57 | 65 | 88 | 57 |
| Tourism services | Decrease | 8 | 6 | 18 | 13 | 6 | 22 | 14 | 32 | 33 | 30 | 15 | 6 | 17 |
| | No change | 35 | 58 | 37 | 43 | 56 | 46 | 48 | 44 | 40 | 51 | 40 | 11 | 42 |
| | Increase | 57 | 35 | 46 | 44 | 38 | 33 | 38 | 24 | 26 | 19 | 46 | 83 | 41 |
| Trade | Decrease | 8 | 4 | 2 | 0 | 0 | 4 | 5 | 10 | 5 | 6 | 4 | 5 | 4 |
| | No change | 41 | 60 | 46 | 37 | 63 | 37 | 41 | 42 | 52 | 51 | 31 | 16 | 43 |
| | Increase | 51 | 36 | 52 | 63 | 38 | 59 | 55 | 47 | 43 | 43 | 65 | 79 | 52 |
| Transport/ communication/ utilities | Decrease | 4 | 7 | 5 | 3 | 0 | 9 | 5 | 5 | 5 | 3 | 8 | 6 | 5 |
| | No change | 29 | 53 | 39 | 57 | 63 | 39 | 41 | 46 | 38 | 50 | 35 | 24 | 43 |
| | Increase | 67 | 40 | 56 | 40 | 38 | 52 | 55 | 49 | 57 | 47 | 56 | 71 | 52 |
| Average percentage of respondents in favor of increase across sectors | | 42 | 24 | 41 | 28 | 22 | 43 | 28 | 35 | 36 | 35 | 41 | 58 | |

Source: Crone 1999b.

Whittier, Anchorage, Cordova, Valdez, and Girdwood each had a majority of respondents favoring an increase in the tourism services sector, whereas in all other communities respondents favored no change in this sector in their community. The communities of Soldotna, Seward, and Sterling each had more respondents favoring a decrease in tourism services than an increase. These communities are perhaps approaching a saturation point where the drawbacks associated with tourism, such as increased traffic, crowds, and prices, are beginning to outweigh the benefits of increased employment and inflow of outside money.

The average of the percentage of respondents who favor an increase in economic activity across all sectors can be used as a comparative indicator of the preference of a community for growth. Using such an indicator reveals that Whittier, Kenai, Anchorage, and Valdez seem most in favor of additional growth. Hope, Cooper Landing, Girdwood, and Moose Pass have the smallest percentage of respondents in favor of additional growth.

If we take the average of the percentage of respondents who favor an increase in a particular sector across all communities, we have a comparative indicator of overall support for growth in that sector. The other services; trade; and transportation, communication, and utilities sectors have the most overall support for additional growth. The government; finance, insurance, and real estate; and mining sectors have the least overall support for additional growth.

## Community Characteristics, Community Resiliency, and Quality of Life

To compare quality of life and community resiliency for the CNF communities of interest, respondents were asked to rate their community in the following 14 areas:

- Attractiveness (compared to other Alaska communities)
- Importance of surrounding scenery to the character of their community

  Abundance of special places nearby
- Their attachment to the community
- Cohesiveness
- Adequacy of public services
- Autonomy
- Economic diversity (compared to other Alaska communities)
- Economic dependence on natural resources
- Attractiveness for businesses
- Preparedness for the future
- Effectiveness of community leaders
- Effectiveness of community government
- Overall quality of life

Table 52 displays the average ratings for each of the 14 questions in each community.

We calculated regional amenity ratings by summing the average ratings of the importance of scenery near the community and the abundance of special places near the community. Economic structure ratings are calculated by summing the average ratings of autonomy, economic diversity, and attractiveness for business. Summing the effectiveness of community leaders and effectiveness of community government average ratings yields a rating of civic leadership. Finally, we combine the average ratings of personal attachment to the community and community cohesiveness to measure the degree of social organization in the community. The scores for these four items are shown for each community in the first four columns in table 53.

Harris and others (2000) define community resiliency as the ability of a community to adapt and respond to change. In their study, they used measurements of the first four items in table 53 to come up with community resiliency indices for 192 of the communities in the interior Columbia River basin. This index is based on the hypotheses that the resiliency of a community is positively correlated with its regional amenities—the surrounding scenery and attractions in the area;

**Table 52—Perceptions of community characteristics by community**

| Characteristic | Anchorage (n=52) | Cooper Landing (n=50) | Cordova (n=57) | Girdwood (n=61) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=24) | Seward (n=58) | Soldotna (n=60) | Sterling (n=37) | Valdez (n=49) | Whittier (n=20) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 7 = "very..." (positive) to 1 = "very..." (negative) (and 95 percent confidence interval)* | | | | | | | | | | | | |
| "How attractive is your community compared to other communities in Alaska?"[a] | 4.9 (4.5-5.3) | 5.3 (4.9-5.7) | 4.7 (4.4-5.1) | 5.6 (5.4-5.9) | 5.3 (4.7-6.0) | 5.0 (4.6-5.4) | 4.4 (3.8-5.1) | 4.9 (4.5-5.2) | 4.5 (4.2-4.9) | 4.5 (4.0-4.9) | 4.5 (4.1-4.9) | 2.6 (1.8-3.3) | 4.7 |
| "How important is the scenery outside your community to the overall character of your community?"[b] | 6.2 (5.8-6.5) | 5.8 (5.4-6.2) | 5.8 (5.2-6.3) | 6.2 (5.9-6.5) | 6.2 (5.8-6.6) | 5.6 (5.2-6.0) | 6.3 (5.8-6.8) | 5.7 (5.2-6.1) | 5.6 (5.2-5.9) | 5.6 (5.1-6.2) | 6.0 (5.7-6.3) | 6.1 (5.2-6.9) | 5.9 |
| "How abundant are special places outside your community?"[c] | 5.4 (5.1-5.8) | 5.6 (5.2-6.0) | 5.8 (5.4-6.3) | 6.2 (5.9-6.4) | 5.7 (5.0-6.3) | 4.7 (4.3-5.2) | 5.6 (5.1-6.1) | 5.2 (4.7-5.6) | 4.9 (4.4-5.3) | 5.3 (4.8-5.9) | 4.9 (4.5-5.4) | 6.1 (5.3-6.8) | 5.5 |
| "How attached are you to your community?"[d] | 4.3 (3.8-4.8) | 5.7 (5.3-6.0) | 5.5 (5.1-5.9) | 5.6 (5.3-5.9) | 5.5 (4.8-6.2) | 4.8 (4.3-5.3) | 5.8 (5.3-6.3) | 5.1 (4.6-5.5) | 4.5 (4.1-4.9) | 4.8 (4.4-5.3) | 4.3 (3.8-4.9) | 4.8 (3.9-5.7) | 5.1 |
| "How would you rate the overall cohesiveness of your community?"[e] | 4.1 (3.7-4.6) | 5.6 (5.3-6.0) | 4.3 (3.9-4.8) | 5.0 (4.6-5.4) | 4.6 (3.7-5.5) | 4.3 (3.8-4.8) | 5.4 (4.8-6.0) | 4.6 (4.2-5.0) | 4.3 (3.9-4.7) | 4.0 (3.5-4.5) | 4.3 (4.0-4.7) | 2.5 (1.8-3.1) | 4.4 |
| "How adequate are the public services in your community?"[f] | 5.1 (4.8-5.4) | 4.8 (4.4-5.1) | 4.9 (4.5-5.3) | 5.4 (5.1-5.7) | 3.6 (2.6-4.5) | 5.1 (4.6-5.5) | 4.7 (4.0-5.4) | 5.0 (4.7-5.3) | 5.0 (4.7-5.3) | 5.0 (4.6-5.4) | 5.4 (5.1-5.7) | 4.0 (3.3-4.7) | 4.8 |

**Table 52—Perceptions of community characteristics by community (continued)**

| Characteristic | Anchorage (n=52) | Cooper Landing (n=50) | Cordova (n=57) | Girdwood (n=61) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=24) | Seward (n=58) | Soldotna (n=60) | Sterling (n=37) | Valdez (n=49) | Whittier (n=20) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 7 = "very..." (positive) to 1 = "very..." (negative) (and 95 percent confidence interval)* | | | | | | | | | | | | |
| "How autonomous is your community?"[g] | 4.6 (4.1-5.0) | 4.1 (3.7-4.5) | 5.0 (4.5-5.4) | 3.8 (3.4-4.2) | 4.6 (3.8-5.5) | 4.3 (3.8-4.7) | 4.1 (3.5-4.7) | 4.3 (3.9-4.8) | 4.0 (3.6-4.4) | 3.4 (2.8-4.0) | 4.6 (4.2-5.1) | 4.3 (3.2-5.5) | 4.3 |
| "How economically diverse is your community compared to others in Alaska?"[h] | 5.5 (5.2-5.8) | 2.8 (2.5-3.1) | 2.9 (2.5-3.1) | 3.0 (2.7-3.4) | 2.4 (1.8-3.1) | 3.7 (3.3-4.2) | 3.2 (2.6-3.7) | 3.9 (3.5-4.3) | 3.9 (3.6-4.3) | 2.6 (2.2-3.1) | 3.1 (2.7-3.5) | 2.4 (1.6-3.2) | 3.3 |
| "What do you think is the overall economic dependence of your community on natural resources?"[i] | 3.1 (2.6-3.5) | 2.7 (2.2-3.2) | 1.9 (1.5-2.3) | 2.8 (2.2-3.2) | 3.7 (2.7-4.7) | 3.0 (2.4-3.6) | 3.8 (3.3-3.4) | 3.3 (2.9-3.7) | 2.1 (1.7-2.4) | 2.9 (2.3-3.4) | 2.1 (1.7-2.6) | 3.9 (3.0-4.8) | 2.9 |
| "How attractive is your community for business compared to other communities in Alaska?"[j] | 5.0 (4.6-5.4) | 4.3 (3.9-4.7) | 3.6 (3.2-4.0) | 4.7 (4.3-5.1) | 3.4 (2.6-4.2) | 4.2 (3.8-4.7) | 3.9 (3.2-4.5) | 4.7 (4.4-5.0) | 4.7 (4.3-5.0) | 3.9 (3.2-4.5) | 3.9 (3.4-4.3) | 3.7 (2.8-4.5) | 4.2 |
| "How prepared for the future is your community?"[k] | 4.2 (3.9-4.6) | 4.5 (4.1-4.9) | 3.6 (3.2-4.0) | 4.2 (3.8-4.6) | 2.9 (2.1-3.7) | 3.9 (3.4-4.3) | 3.5 (2.9-4.2) | 4.1 (3.8-4.5) | 3.8 (3.5-4.1) | 3.1 (2.7-3.4) | 3.4 (3.0-3.8) | 3.4 (2.5-4.3) | 3.7 |
| "How effective are your community leaders?"[l] | 4.1 (3.6-4.5) | 4.4 (4.0-4.7) | 3.5 (3.1-3.9) | 3.7 (3.3-4.0) | 3.9 (3.0-4.8) | 3.6 (3.1-4.1) | 4.1 (3.6-4.5) | 3.9 (3.6-4.3) | 3.8 (3.5-4.1) | 3.5 (3.0-4.1) | 3.6 (3.2-4.1) | 2.7 (1.8-3.5) | 3.7 |

**Table 52—Perceptions of community characteristics by community (continued)**

| Characteristic | Anchorage (n=52) | Cooper Landing (n=50) | Cordova (n=57) | Girdwood (n=61) | Hope (n=18) | Kenai (n=48) | Moose Pass (n=24) | Seward (n=58) | Soldotna (n=60) | Sterling (n=37) | Valdez (n=49) | Whittier (n=20) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Scale: 7 = "very..." (positive) to 1 = "very..." (negative) (and 95 percent confidence interval)* | | | | | | | | | | | | |
| "How effective is your community government?"[m] | 3.9 (3.5-4.3) | 3.8 (3.3-4.2) | 3.6 (3.2-4.0) | 3.5 (3.1-3.9) | 3.7 (2.7-4.7) | 3.6 (3.1-4.1) | 3.7 (3.1-4.3) | 3.8 (3.4-4.1) | 3.6 (3.3-4.0) | 3.2 (2.7-3.7) | 3.6 (3.1-4.0) | 2.9 (2.1-3.7) | 3.6 |
| "How would you rate the overall quality of life for your community?"[n] | 5.1 (4.8-5.5) | 5.6 (5.3-5.9) | 5.1 (4.7-5.4) | 5.7 (5.5-5.9) | 5.2 (4.4-6.0) | 4.8 (4.4-5.2) | 5.5 (5.1-6.0) | 4.9 (4.6-5.2) | 4.7 (4.4-5.1) | 5.1 (4.8-5.5) | 4.8 (4.5-5.1) | 4.0 (3.3-4.7) | 5.1 |

[a] Scale: 7 = "extremely attractive" to 1 = "extremely unattractive."
[b] Scale: 7 = "extremely important" to 1 = "extremely unimportant."
[c] Scale: 7 = "extremely abundant" to 1 = "not at all abundant."
[d] Scale: 7 = "extremely attached" to 1 = "extremely unattached."
[e] Scale: 7 = "extremely strong sense of community" to 1 = "extremely weak sense of community."
[f] Scale: 7 = "extremely adequate" to 1 = "extremely inadequate."
[g] Scale: 7 = "extremely independent and self-reliant" to 1 = "extremely dependent and linked."
[h] Scale: 7 = "extremely diversified" to 1 = "extremely undiversified."
[i] Scale: 7 = "extremely independent" to 1 = "extremely dependent."
[j] Scale: 7 = "extremely attractive" to 1 = "extremely unattractive."
[k] Scale: 7 = "totally prepared" to 1 = "totally unprepared."
[l] Scale: 7 = "extremely effective" to 1 = "extremely ineffective."
[m] Scale: 7 = "extremely effective" to 1 = "extremely ineffective."
[n] Scale: 7 = "extremely high QOL" to 1 = "extremely low QOL."
Source: Crone 1999b.

**Table 53—Community resiliency and quality of life**

| Community | Regional amenities | Social organization | Economic structure | Civic leadership | Community resiliency | Quality of life measure 1 | Quality of life measure 2 |
|---|---|---|---|---|---|---|---|
| Anchorage | 11.6 | 8.4 | 15.0 | 7.9 | 37.9 | 5.1 | 28.5 |
| Cooper Landing | 11.5 | 11.3 | 11.2 | 8.1 | 38.4 | 5.6 | 36.5 |
| Cordova | 11.6 | 9.8 | 11.5 | 7.1 | 36.1 | 5.1 | 39.1 |
| Girdwood | 12.4 | 10.6 | 11.5 | 7.2 | 37.8 | 5.7 | 29.9 |
| Hope-Sunrise | 11.9 | 10.1 | 10.4 | 7.7 | 36.6 | 5.2 | 29.6 |
| Kenai | 10.3 | 9.1 | 12.2 | 7.2 | 34.8 | 4.8 | 23.5 |
| Moose Pass | 11.9 | 11.2 | 11.1 | 7.8 | 38.3 | 5.5 | 29.1 |
| Seward | 10.8 | 9.7 | 12.9 | 7.7 | 36.8 | 4.9 | 19.2 |
| Soldotna | 10.5 | 8.8 | 12.6 | 7.4 | 35.1 | 4.7 | 20.2 |
| Sterling | 10.9 | 8.9 | 10.0 | 6.7 | 33.2 | 5.1 | 19.6 |
| Valdez | 10.9 | 8.7 | 11.6 | 7.2 | 34.5 | 4.8 | 15.0 |
| Whittier | 12.1 | 7.3 | 10.4 | 5.6 | 31.8 | 4.0 | 7.8 |

Source: Crone 1999b.

social organization—the degree of consensus in values and goals and the ability to work together to achieve those goals; economic structure—the degree of autonomy, economic diversity and attractiveness for business; and civic leadership—the degree of commitment and involvement of leaders and groups to create or respond to change. Adopting the same hypotheses, we computed community resiliency scores by summing the ratings in the first four columns for each community in table 53.[9] The relative community resiliency ranking from highest to lowest is Cooper Landing, Moose Pass, Anchorage, Girdwood, Seward, Hope, Cordova, Soldotna, Kenai, Valdez, Sterling, and Whittier.

Two measures can be used and compared to assess feelings of respondents about the overall quality of life in their community. The first measure is the average quality-of-life ratings shown in the last row of table 52. A second measure is derived by weighting the 30 quality-of-life average satisfaction ratings from table 46 by their respective average importance ratings from table 45 and summing these weighted ratings for each community.[10] These quality-of-life ratings are shown in table 53. The relative quality-of-life ranking using the first measure is Girdwood, Cooper Landing, Moose Pass, Hope, Sterling, Anchorage, Cordova, Seward, Kenai, Valdez, Soldotna, and Whittier. The relative quality-of-life ranking using the second measure is Cordova, Cooper Landing, Girdwood, Hope, Moose Pass, Anchorage, Kenai, Soldotna, Sterling, Seward, Valdez, and Whittier. The relative rankings are similar for most of the communities, with the exceptions of Cordova and Sterling. Cordova was ranked seventh with the first measure, but first with the second measure. Valdez was ranked fifth with the first measure but fell to ninth using the second measure.

[9] The economic structure measurement was converted to a 14-point scale to be weighted equally with the other three factors.

[10] The importance ratings for each respondent were converted from a 1 (= extremely important) to 4 (= not at all important) scale to a 0 (= not at all important) to 3 (= extremely important) scale. The satisfaction ratings were converted from a 1 (= very satisfied) to 5 (= very unsatisfied) scale to a 2 (= very satisfied) to –2 (= very unsatisfied) scale.

## Changes in Community Desirability and Preferences for Residency

Table 54 displays the percentages of respondents who felt their community had become more desirable, stayed the same, or become less desirable since they had lived there. Only in Hope did the largest percentage of respondents feel their community had become more desirable. The response chosen most often in the communities of Anchorage, Cooper Landing, Girdwood, and Moose Pass was "stayed the same." In all other communities, the largest proportion of respondents felt their communities "were less desirable." Whittier and Cordova had the smallest proportion of respondents who felt their community had become more desirable (5 and 14 percent, respectively).

Table 55 shows the percentages of respondents who would stay in their community, move to another community in Alaska, or move to another community outside of Alaska, if they had the ability to live anywhere with the same standard of living. Girdwood, Cooper Landing and Sterling had the highest percentages of respondents who would remain in the same community (88, 86, and 84 percent, respectively). Valdez, Anchorage, and Whittier had the highest percentages of respondents who would move elsewhere (55, 44, and 39 percent, respectively). Fifty-four percent of the respondents who would move from Anchorage would leave the state, whereas 36 percent of the movers from Valdez and 15 percent from Whittier would leave the state.

## Survey Summary

Results from this survey which may be useful in the planning process, include:

- In most communities, respondents felt that local community interests should be given more attention than national interests in public land use planning near their community.
- The quality of life in the CNF communities of interest is heavily influenced by factors that are related to public lands or affected by public land management activities.
- In most communities, survey respondents favored the current amount of economic activity in the sectors most associated with forest resources.
- Whittier, Kenai, Anchorage, and Valdez seem the most in favor of additional growth in their communities, whereas Hope, Cooper Landing, Girdwood, and Moose Pass seem the least in favor of additional growth.
- The quality of life and community resiliency of the CNF communities of interest is generally high, although the community of Whittier had both the lowest quality of life ranking and the lowest community resiliency score.

**Table 54—Changes in desirability of community**

| Status | Anchorage (n=51) | Cooper Landing (n=46) | Cordova (n=56) | Girdwood (n=61) | Hope (n=17) | Kenai (n=47) | Moose Pass (n=21) | Seward (n=58) | Soldotna (n=58) | Sterling (n=38) | Valdez (n=47) | Whittier (n=19) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Percent (and 95 percent confidence interval)* | | | | | | | |
| More desirable | 24 | 33 | 14 | 33 | 47 | 30 | 29 | 33 | 22 | 24 | 26 | 5 | 27 |
| | (10-40) | (17-51) | (5-28) | (19-48) | (17-75) | (15-47) | (8-55) | (18-49) | (10-38) | (9-43) | (11-43) | (0-30) | |
| Stayed the same | 39 | 43 | 41 | 36 | 35 | 32 | 43 | 22 | 29 | 37 | 36 | 42 | 36 |
| | (23-56) | (25-61) | (25-57) | (21-52) | (10-65) | (16-50) | (17-69) | (10-38) | (16-45) | (18-57) | (20-54) | (15-69) | |
| Less desirable | 37 | 24 | 45 | 31 | 18 | 38 | 29 | 45 | 48 | 39 | 38 | 53 | 37 |
| | (21-54) | (10-41) | (28-61) | (17-47) | (1-47) | (21-56) | (8-55) | (29-61) | (32-64) | (20-59) | (21-56) | (23-78) | |

Source: Crone 1999b.

**Table 55—Preferences for residency**

| Location | Anchorage (n=50) | Cooper Landing (n=51) | Cordova (n=56) | Girdwood (n=58) | Hope (n=17) | Kenai (n=48) | Moose Pass (n=23) | Seward (n=55) | Soldotna (n=57) | Sterling (n=38) | Valdez (n=49) | Whittier (n=18) | Average across communities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *Percent (and 95 percent confidence interval)* | | | | | | | |
| Same community | 56 | 86 | 71 | 88 | 82 | 73 | 83 | 71 | 70 | 84 | 45 | 61 | 73 |
| | (37-72) | (70-95) | (54-84) | (73-96) | (50-97) | (54-86) | (54-96) | (53-84) | (53-83) | (64-95) | (27-62) | (29-85) | |
| Another community in Alaska | 20 | 12 | 16 | 9 | 18 | 13 | 13 | 15 | 7 | 11 | 35 | 33 | 17 |
| | (8-36) | (3-26) | (6-31) | (2-21) | (2-46) | (3-28) | (1-37) | (5-29) | (1-19) | (2-27) | (19-52) | (9-62) | |
| Outside of Alaska | 24 | 2 | 13 | 3 | 0 | 15 | 4 | 15 | 23 | 5 | 20 | 6 | 11 |
| | (11-41) | (0-12) | (4-26) | (0-14) | | (4-30) | (0-25) | (5-29) | (11-38) | (0-20) | (8-37) | (0-31) | |

Source: Crone 1999b.

## References


**Alaska Commercial Fisheries Entry Commission. 1999a.** Basic information tables. www.cfec.state.ak/bit/. [Date accessed unknown].

**Alaska Commercial Fisheries Entry Commission. 1999b.** Commercial fishing catch data aggregated by Alaska census division and city. http://www. cfec.state.ak/cenge/. [Date accessed unknown].

**Alaska Commercial Fisheries Entry Commission. 1999c.** Notice of intent list. http://www.cfec.state.ak/intents/. [Date accessed unknown].

**Alaska Department of Education and Early Development. 1999.** Public school enrollments. http://www.educ.state.ak.us/stats/home.html. [Date accessed unknown].

**Alaska Department of Labor. 1998.** Alaska community database. community information summaries. http:// www.comregaf.state.ak.us/mra/CF_COMDB.htm. [Date accessed unknown].

**Alaska Department of Labor, Research and Analysis. 1996.** Alaska population overview, 1996 estimates. Juneau, AK. 140 p.

**Alaska Department of Labor, Research and Analysis. 1999a.** Alaska population overview, 1998 estimates. Juneau, AK. 150 p. Vol. 18.

**Alaska Department of Labor, Research and Analysis. 1999b.** Employment and earnings summary report, 1997. Juneau, AK. 60 p.

**Alaska Division of Trade and Development. 1999a.** Alaska energy industries: oil, gas, and coal. Juneau, AK: Department of Commerce and Economic Development. 8 p.

**Alaska Division of Trade and Development. 1999b.** Mining and Minerals. http://www.dced.state.ak.us/trade/mine.htm. [Date accessed unknown].

**Attaran, M. 1986.** Industrial diversity and economic performance in U.S. areas. Annals of Regional Science. 20(2): 44-45.

**Bowker, J.M. 2001.** Outdoor recreation participation and use by Alaskans: projections 2000-2020. Gen. Tech. Rep. PNW-GTR-527. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 22 p.

**Brooks, D.; Haynes, R. 1997.** Timber products output and timber harvests in Alaska: projects for 1992-2010. Gen. Tech. Rep. PNW-GTR-409. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 17 p.

**Brooks, D.; Haynes, R. 2001.** Recreation and tourism in south-central Alaska: synthesis of recent trends and prospects. Gen. Tech. Rep. PNW-GTR-409. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 19 p.

**Brown, G. 2001.** Personal communication. Associate professor, Alaska Pacific University, 4101 University Drive, Anchorage, AK 99508.

**Brown, G. 1999.** Alaska community quality of life study (detailed responses), and Chugach National Forest planning study (detailed responses). http://polar.alaska.pacific.edu/gregb/research.htm. [Date accessed unknown].

**Colt, S.; Martin, S.; Mieren, J.; Tomeo, M. 2002.** Recreation and tourism in south-central Alaska: patterns and prospects. Gen. Tech. Rep. PNW-GTR-551. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 77 p.

**Crone, L. 1999a.** Unpublished data based on responses to "Planning for the Future of the Chugach National Forest" survey. On file with: USDA Forest Service, Pacific Northwest Research Station, 2770 Sherwood Lane, Suite 2A, Juneau, AK 99801.

**Crone, L. 1999b.** Unpublished data based on responses to "Your Community's Quality of Life and Future" survey. On file with: USDA Forest Service, Pacific Northwest Research Station, 2770 Sherwood Lane, Suite 2A, Juneau, AK 99801.

**Davidson, A. 1990.** In the wake of the *Exxon Valdez*: the devastating impact of the Alaska oil spill. San Francisco: Sierra Club Books. 333 p.

**Economic Report of the President. 2000.** Washington, DC: United States Government Printing Office. 432 p.

**Fried, N.; Windisch-Cole, B. 1999**. The Kenai Peninsula. Alaska Economic Trends. 19(10): 3-15.

**Goldsmith, S. 1998.** Population, employment, and income projections for Alaska census areas. Anchorage, AK: University of Alaska, Institute for Social and Economic Research. 16 p.

**Goldsmith, S. 1999.** Economic projections for Alaska and the southern railbelt 1999-2025. Anchorage, AK: University of Alaska, Institute for Social and Economic Research. 13 p.

**Hadland, J. 1998.** Alaska's resident workforce increases. Alaska Economic Trends. 18(3): 1-8.

**Hadland, J. 1999.** Nonresidents working in Alaska—1997. Juneau, AK: [Publisher unknown]; report prepared by Alaska Department of Labor, Research and Analysis Section. 29 p.

**Harris, C.; McLaughlin, W.; Brown, G.; Becker, D. 2000.** Rural communities in the inland Northwest: an assessment of small rural communities in the interior and upper Columbia River basins. Gen. Tech. Rep. PNW-GTR-477. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. (Quigley, T.M., ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment). 120 p.

**Hutchison, K. 1999a.** Are fishermen on endangered list? Juneau Empire. May 2; Sect. A: 1 (col. 1).

**Hutchison, K. 1999b.** A salmon's life, down on the farm. Juneau Empire. May 2; Sect. C: 1 (col. 4).

**Hutchison, K. 1999c.** Delivering salmon customers want. Juneau Empire. May 5; Sect. A: 1 (col. 1).

**Hutchison, K. 1999d.** Fish farms reshaping people's lives. Juneau Empire. May 6; Sect. A: 1 (col. 1).

**Hutchison, K. 1999e.** Fishin' gone? Juneau Empire. May 2; Sect. C: 1 (col. 2).

**Hutchison, K. 1999f.** The next generation: where the global seafood industry is going. Juneau Empire. May 7; Sect. A: 5 (col. 4).

**Hutchison, K. 1999g.** Pinching pennies for a market edge. Juneau Empire. May 4; Sect. A: 1 (col. 3).

**Hutchison, K. 1999h.** Reshaping fishing's future. Juneau Empire. May 7; Sect. A: 1 (col. 3).

**Hutchison, K. 1999i.** Spawning environmental worries. Juneau Empire. May 3; Sect. A: 1 (col. 1).

**McDowell Group. 1989.** Alaska seafood industry study—a technical report: an economic profile of the seafood industry in Alaska. Juneau, AK. 57 p.

**McDowell Group. 1991.** Alaska's visitor industry: an economic profile. Juneau, AK. Prepared for Alaska Division of Tourism, Department of Commerce and Economic Development. 132 p.

**McDowell Group. 1999a**. Alaska visitor industry: economic impact study, 1999 update. Juneau, AK. Prepared for Alaska Division of Tourism, Department of Commerce and Economic Development. 44 p.

**McDowell Group. 1999b**. Salmon market bulletin. Juneau, AK: Salmon Market Information Service. 1(2): 1-4.

**Minnesota IMPLAN Group, INC. 1999.** IMPLAN Professional™. Version 2.0. Stillwater, MN.

**Mosher, T. 1998.** Seafood processing leads rebound in new hires during first quarter of 1997. Alaska Economic Trends. 18(3): 7-10.

**Newbold, P. 1991.** Statistics for business and economics. 3rd ed. Englewood Cliffs, NJ: Prentice Hall. 930 p.

**Picou, J.S.; Gill, D.A. 1996.** The *Exxon Valdez* oil spill and chronic psychological stress. In: Rice, S.D., ed. Proceedings of the *Exxon Valdez* oil spill symposium. Bethesda, MD: American Fisheries Society Symposium. 18: 879–873.

**Picou, J.S.; Gill, D.A.; Cohen, M.J., eds.** 1999. The *Exxon Valdez* disaster: readings on a modern social problem. 2nd ed. Dubuque, IA: Kendall-Hunt Publishers. 337 p.

**Rolston, H. 1988.** Environmental ethics: duties to and values in the natural world. Philadelphia, PA: Temple University Press. 391 p.

**Salmon Market Information Service. 1998.** Salmon Market Bulletin. University of Anchorage: Number 31. 8 p.

**Salmon Market Information Service. 1999a.** Alaska salmon harvest: average price. http://shiva.its.uaa.alaska.edu/smis/. [Date accessed unknown].

**Salmon Market Information Service. 1999b.** Alaska salmon harvest: harvest volume. http://shiva.its.uaa.alaska.edu/smis/. [Date accessed unknown].

**Shannon, C.E.; Weaver, W. 1949.** The mathematical theory of communication. Urbana, IL: The University of Illinois Press. 117 p.

**Smith, G. 1999.** Northwest Income Indicators Project Web Site. Shift share analysis. http://niip.wsu.edu/washington/ssharewa.htm. [Date accessed unknown].

**Szumigala, D.J.; Swainbank, R.C. 1999.** Alaska mineral industry 1998: a summary. Information Circular 45. Fairbanks, AK: Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys. 13 p.

**U.S. Bureau of Economic Analysis. 1999.** Regional economic information system, 1969-1997. [CD-ROM].

**U.S. Department of Agriculture, Forest Service. 1998a.** Analysis of the management situation. R10-MB-372. Anchorage, AK: Alaska Region. 106 p.

**U.S. Department of Agriculture, Forest Service. 1998b.** Timber supply and demand, 1998; report to Congress, ANILCA Section 706(a). Juneau, AK: Alaska Region. 31 p.

**U.S. Department of Agriculture, Forest Service. 1999.** Payments to the state regional database. Juneau, AK: Alaska Region.

**U.S. Department of Agriculture, Forest Service. 2000.** Timber volume cut and sold regional database. Juneau, AK: Alaska Region.

**U.S. Department of Commerce, Bureau of the Census. 1980.** 1980 census of population, general social and economic characteristics of Alaska. Washington, DC. 233 p.

**U.S. Department of Commerce, Bureau of the Census. 1990.** 1990 census of population, social and economic characteristics of Alaska. http://factfinder.census.gov/. [Date accessed unknown].

**U.S. Department of Commerce, Bureau of the Census. 1999.** Statistical abstract of the United States: 1998. Washington, DC. 1020 p.

**U.S. Department of the Interior, Fish and Wildlife Service. 1998.** Federal subsistence management program operations manual for regional council members. Anchorage, AK: Fish and Wildlife Service, Office of Subsistence Management. 102 p.

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