United States
Department of
Agriculture

Forest Service

Pacific Northwest
Research Station

General Technical
Report
PNW-GTR-665
May 2006

# Alaska Communities and Forest Environments: A Problem Analysis and Research Agenda

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The **Forest Service** of the U.S. Department of Agriculture is dedicated to the principle of multiple use management of the Nation's forest resources for sustained yields of wood, water, forage, wildlife, and recreation. Through forestry research, cooperation with the States and private forest owners, and management of the National Forests and National Grasslands, it strives—as directed by Congress—to provide increasingly greater service to a growing Nation.



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## Abstract

**Kruger, Linda E.; Mazza, Rhonda L. 2006.** Alaska communities and forest environments: a problem analysis and research agenda. Gen. Tech. Rep. PNW-GTR-665. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 58 p.

This problem analysis describes a variety of human-resource interaction issues and identifies related social science research and development needs that serve as the foundation for the Alaska Communities and Forest Environments Team within the Pacific Northwest Research Station. The document lays out a research agenda that focuses on understanding relations between human communities and natural resources.

The agenda is divided into four subtopics: (1) communities in transition; (2) collaborative planning and stewardship; (3) sustainable tourism and outdoor recreation; and (4) cultural orientations to and uses and values of natural resources, including traditional knowledge, indigenous property rights, and tenure systems. Research questions are identified within each subtopic. Additional questions are listed in an appendix. The answers to these questions would contribute information important to forest planning and management and could help managers mitigate negative impacts and improve the flow of benefits for communities leading to a better understanding of how to sustain healthy forests and communities.

Keywords: Social science research, Alaska, collaborative planning, communities, tourism and recreation.

## Contents

"Everything is connected…no one thing can change by itself."
—Paul Hawken

"Nothing endures but change."
—Heraclitus, 540–480 B.C.

## Introduction

Social, economic, and biophysical systems are interconnected. This is especially obvious in Alaska where social, cultural, and economic activities are closely connected to land and water resources. When change occurs in any one of these systems, it can ripple along their common interface—often having unintended or unexpected consequences. Ecosystem change and natural resource management affect human communities in ways that are not well understood. Communities respond to these effects in many ways, yet we lack the understanding to predict how a community might be affected or respond. A knowledge base of case studies and experiences could help us craft strategies for helping communities effectively adapt and in other ways respond to change. Studying the dynamics of these systems enables us to better understand how human communities respond to natural and human-mediated change. Study and analysis of relationships between people and natural resources can help managers understand implications of management actions, how communities might respond to changing conditions and why.

Since the 1970s, social science research in Alaska has examined human values for and uses of natural resources (Clark and Lucas 1978). This research has sought to increase understanding of the connections between ecological systems as influenced by natural resource management, and social, cultural, and economic change. In 2003, the USDA Forest Service Pacific Northwest (PNW) Research Station established the Alaska Communities and Forest Environments team (ACaFE) within the Human and Natural Resource Interactions (HNRI) Program to study social systems and their relation to the ecological systems in which they are embedded. The team provides scientific and technical support to Alaska's communities and natural resource managers while advancing understanding of social systems in transition.

This problem analysis provides context and describes the need for social science research, development, and applications for Alaska. The primary focus of the research agenda is on relations between human communities and natural resources. The analysis recognizes that communities and natural resource systems are nested (Beckley 1998), occurring at multiple spatial scales, and interacting within and across spatial and temporal scales.

The agenda is ambitious and anticipates collaboration with an extensive internal and external network of practitioners and scientists doing interrelated, mutually informing work. Research will incorporate approaches from natural resource sociology, ecological economics, cultural geography, and political ecology. Attention will be given to learning from and comparing findings with national and international studies that have biogeographic and socioeconomic conditions or phenomena that are similar to those of Alaska. Case studies and collections of best practices are useful to managers and communities as they seek to understand and design approaches to community-forest relations.

One example of a research need is understanding how communities respond when faced with change (Tsournos and Haynes 2004). The wood products sector in Alaska has experienced significant changes resulting from competition from other regions and shifts in market conditions. Changing expectations of forest users and other stakeholders have also affected resource management. At the same time, values for timber have been joined by increasing recognition of the value of a wide variety of other ecosystem services. For some communities, this has meant the loss of a major employer and primary industry.

Communities have responded in various ways. Some communities have thrived with expanding tourism, service-sector jobs and unearned income (money from pensions, social security, unemployment, welfare, medical and disability benefits, dividends, and investments) more than making up for lost timber industry jobs. Other communities have languished, unable to reorient around new opportunities and resource bases, with some hoping the golden days of big timber will return. This problem analysis and research agenda begins to address what underlies the different responses—the relations among natural resources, management activities, and communities; and the interplay between community change and broad-scale socioeconomic and biophysical change.

**This problem analysis and research agenda begins to address the interplay between community change and broad-scale socioeconomic and biophysical change.**

The agenda is divided into four overlapping and interrelated topics:

- Communities in transition
- Collaborative planning and stewardship
- Tourism and outdoor recreation
- Cultural orientations to and uses and values of natural resources, including traditional knowledge, indigenous property rights, subsistence, and tenure systems

Focus areas and research questions were developed by reviewing other research and documents on research needs and through discussions and meetings with scientists and managers from federal and state agencies, scientists from universities, and stakeholders from communities and nongovernmental organizations (fig. 1). The problem analysis identifies policy, management, and theory needs. The research agenda provides the foundation for the research process that begins with the design of research questions and leads to research reports, tools, and other products for managers and communities, and invariably more questions.

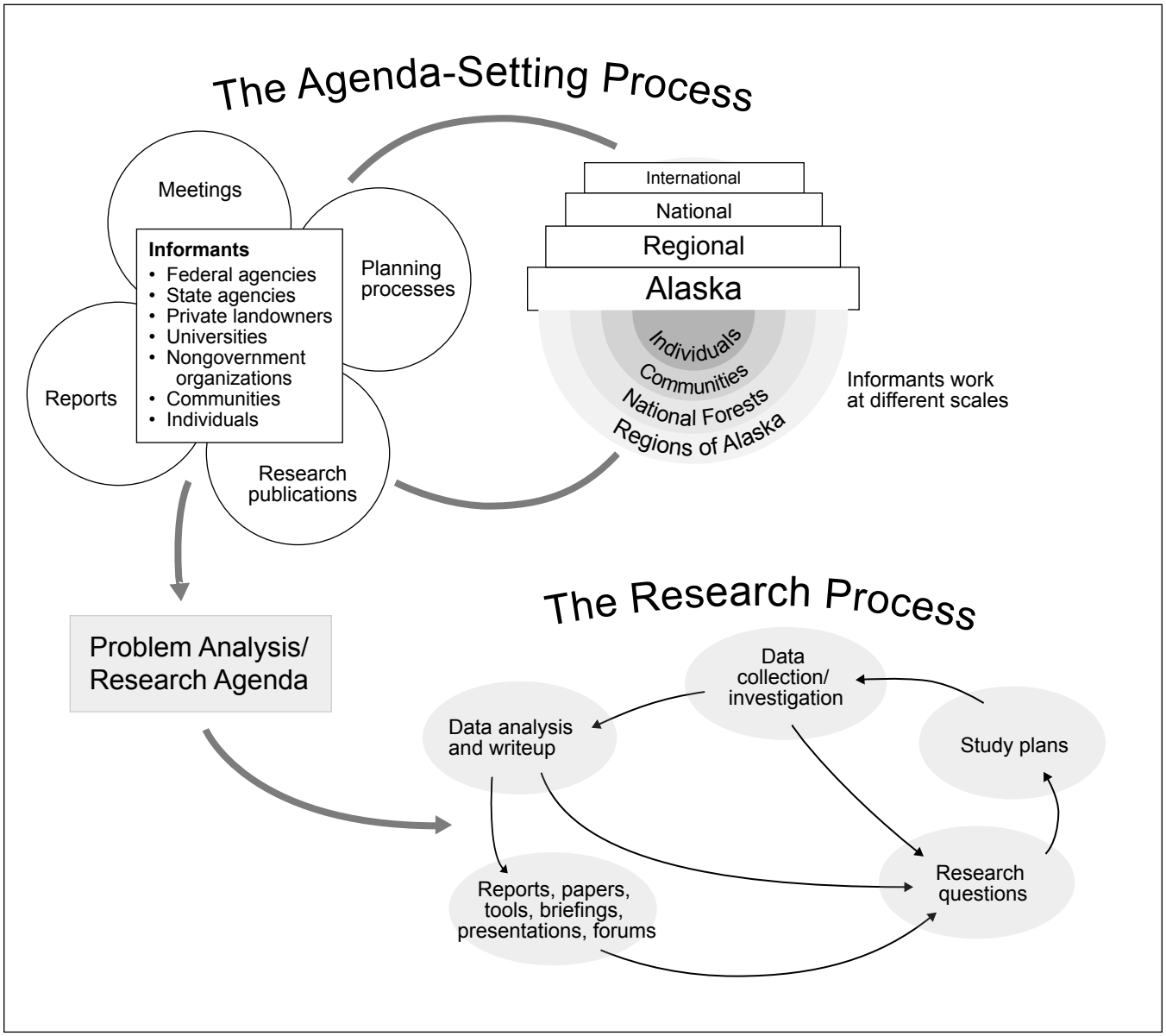


Figure 1—Agenda setting and research process.

## Setting the Context

### An Increasing Role for Social Science

Noneconomic natural resource social science is relatively new and often not understood by resource managers. In their overview of the advancement of social science in natural resource management, Stankey and McCool (2004: 23–27) identified seven factors that have led to greater inclusion of social science in natural resource policy development and management. First, there is increasing awareness among resource managers that the dilemmas they face are social in nature; many result from conflicts over meanings ascribed to landscapes, resources, and ecosystems. Second, there is increasing interest in "deliberative or discursive forms of democracy, emphasizing dialogue, learning and evaluation of planned actions" (Stankey and McCool 2004: 25). Third, there is "growing recognition of the limits of traditional expert-based and rational comprehensive planning processes" (Stankey and McCool 2004: 25). Fourth, there is a hierarchy of nested scales resulting in "differing interests in the outcomes of particular decisions reveal[ing] themselves at different scales" (Stankey and McCool 2004: 25). Fifth, "the social sciences can help frame natural resource issues and problems" (Stankey and McCool 2004: 26). Sixth, integration of social sciences into natural resource policy and management processes has been challenging and has met with mixed results but shows promise and growing support. Finally, higher education is shifting its approach from forestry or natural resources to more highly integrated programs.

**We are experiencing a period of dramatic social change accompanied by conflicts over the management of natural resources.**

We are experiencing a period of dramatic social change and conflicts over natural resource management. Social science can contribute to greater insight and understanding of these conditions and provide tools, protocols, and processes to help policymakers and managers make sense of social conditions, design possible courses of action, and predict possible public reaction. "Social scientists are faced with both a great opportunity as well as an obligation to help the legal, policy, and management sectors tailor programs that are responsive to the Nation's democratic traditions while at the same time, remain consistent with biophysical and economic considerations" (Stankey and McCool 2004: 28).

### Interest in Communities

Communities that historically have been dependent on timber for their economic well-being have had to look for new economic opportunities as logging and milling activities have declined. Particularly in the Pacific Northwest and Alaska, politicians, community leaders, and agency managers have expressed concern over economic and social conditions in traditionally timber-dependent

communities (Lee et al. 1990). Lee et al. (1990: 3) noted that in many of these communities, growth has been spurred by tourism, recreation, and retirement: "Small towns with attractive natural amenities and relatively easy access to metropolitan regions have often been rejuvenated by such service-based activity." Communities exhibit great variation, however; some communities have experienced dramatic growth, whereas others have languished or declined. Social scientists and resource managers strive for a better understanding of resource-based communities, the complex social and economic processes—from local to global—that cause change, and the links between natural resources and human communities at multiple scales.

The research outlined here contributes to this effort by focusing on links among human communities, natural resources, and forest policy and management (fig. 2). Research will address questions about the implications of forest policy and management for communities. Research will also strive to clarify similarities and differences in community-forest relations in Alaska as compared to situations in other locations. A frequently heard refrain is "Alaska is different." One noticeable difference is that extensive governmental ownership has resulted in a higher level of agency responsibility to local communities than in other states. The landscape, ecosystems, climate, and remote and sometimes difficult access are factors that also may contrast with other states. By using social science research, we will explore the ways in which Alaska is different, as well as the ways in which social processes, relations, and outcomes in Alaska are similar to those found in other locations. We will also explore questions fairly unique to Alaska including those that address aspects of Alaska Native relations to the land and natural resources and the overlap among recreation, tourism, and subsistence uses.

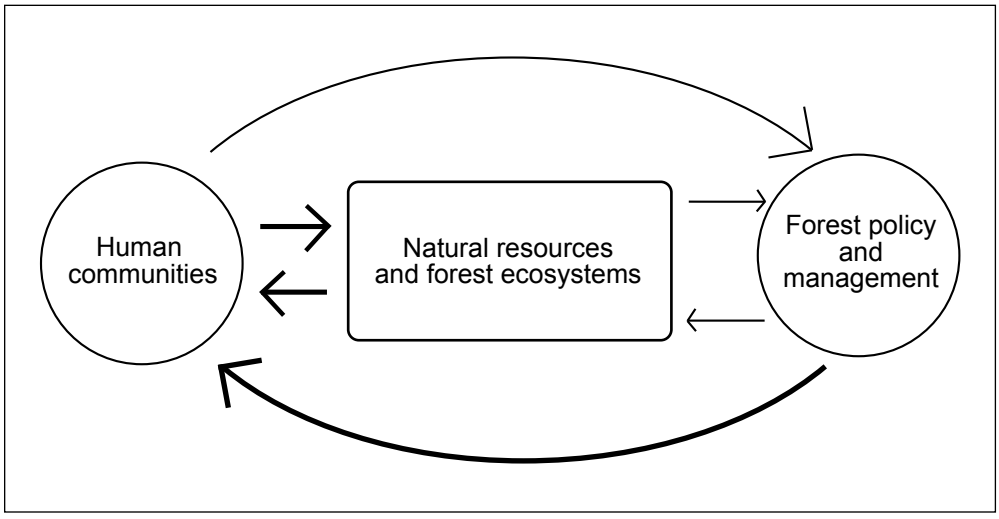


Figure 2—Problem analysis and research agenda focus.

## National Strategies for National Forests

Forest Service Chief Dale Bosworth has identified four threats to the national forests: (1) fire and fuels, (2) invasive species, (3) loss of open space, and (4) unmanaged recreation. The Chief's Strategic Plan for fiscal years 2004–2008 includes objectives to reduce these threats and improve forest health on lands susceptible to catastrophic wildland fire; treat invasive species; use small-diameter trees for biomass energy; restore watersheds and maintain riparian habitat; restore and maintain species diversity; improve public access and opportunities for recreation; and provide information in a timely manner. The research agenda presented here responds to these threats and strategic objectives by focusing on community as a social unit of analysis set within a dynamic global context.

In Alaska, there are several issues related to the four threats. The risk of fire in interior Alaska, the greater Anchorage area, and the Kenai Peninsula is often high during dry summer months. There is an opportunity to work with State and Private Forestry and local communities to develop and monitor programs that engage property owners in fire preparedness and fuels reduction efforts on private property. Fire hazard is augmented by insect infestations and disease. For example, a spruce bark beetle (*Dendroctonus rufipennis*) infestation on the Kenai Peninsula and dieback of yellow-cedar (*Chamaecyparis nootkatensis* (D. Don) Spach) in southeast Alaska are of critical concern. The beetle infestation has resulted in thousands of acres of dead trees, creating an extreme fire hazard for forests and high risk for communities on the Kenai Peninsula (fig. 3). Some interior forests also are at risk of wildland fire.

Although the Forest Service has raised public awareness of forest fires started by campfires or other recreation activities, less attention has been given to invasive species that may be spread inadvertently by tourism and recreation activities. Society's increased mobility and the desire to go from a backcountry vacation in the Rocky Mountains to the backcountry of Alaska increases the vectors for transport and dispersal of nonnative species. Increasing our understanding of the connection between recreation and tourism and invasive species is timely. It may help managers develop better communication strategies and programs to enlist volunteers to assist with monitoring and eradication during the course of the recreation experience. Managing invasive species requires coordination among the land management agencies that provide recreational opportunities in the state (the Forest Service, National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Service, Alaska Native corporations, and various state agencies) and commercial operators who use public land.

Figure 3—Beetle infestation on the Kenai Peninsula. Photo by Dustin Wittwer.

With so much land in federal ownership, concerns for open space take a slightly different orientation in Alaska. The transfer of approximately 150 million acres to local governments and Native corporations has reduced public access in some areas. Land claims awaiting settlement could result in even more land changing hands, especially in southeast Alaska. In many communities, geography also limits residential space. Using this space for development of vacation homes and part-time residences limits opportunities for year-round residents and drives up housing prices. There has been little attention to the implications of additional privatization of land or increasing numbers of absentee and part-time landowners and part-time residents.

Land managers in Alaska face an abundance of remote, uncontrolled access points that are used by the public for recreation and subsistence activities. Determining who is using public land, for what purpose, and the attributes that people hold to be important to their experience is often difficult and expensive. Managing for recreation as one of several benefits and services communities receive from forests requires understanding recreation supply, demand, and use trends and the complex interactions between recreation and the numerous other services provided by forests.

The 2004–2008 strategic plan objectives expand on earlier objectives (USDA FS 2000), which focused on the agency's role in maintaining ecosystem health and providing multiple benefits, scientific and technical assistance, and effective public service. Social science research plays an important role in helping managers understand the range of goods and services the forest provides, and the ways in which these goods and services are used and valued by different segments of the public. Increasing recognition of the importance of ecosystem services has expanded the value of public forests to more than potential timber harvests. Ecosystem services are the human benefits—both goods and services—that result from ecosystem functions. They include the regulation of atmospheric gases, climate, and water quality and supply as well as waste absorption capacity, erosion control and sediment retention, soil formation, nutrient cycling, pollination, habitat, genetic resources, recreation, and goods such as materials important for cultural traditions (Costanza et al. 1997).

**Increasing recognition of the importance of ecosystem services has expanded the value of public forests to more than potential timber harvests.**

Providing multiple benefits means offering diverse, high-quality opportunities to interact with, benefit from, appreciate, and use forest resources. This requires improving the capability of wildland areas to sustain a desired range of benefits and values, increasing accessibility to recreation and wilderness to a diverse population, and improving the capability of forests to provide sustainable levels of uses, values, products, and services while maintaining ecosystem health.

Providing scientific and technical assistance includes building capacity of tribal governments, rural communities, and private landowners to adapt to natural-resource-related change; improving knowledge and developing tools and protocols to support decisionmaking, sustainable management, and to minimize and mitigate impacts on communities and ecosystems; and broadening community participation in research and management. In addition to national strategies, the research proposed here is aligned with international efforts. Although an exhaustive accounting of these is not provided here, one international effort is particularly worth mentioning.

The 1992 United Nations Conference on Environment and Development (UNCED), also referred to as the Rio Earth Summit, recognized the importance of forests to the well-being of local communities, national economies, and the Earth. Following the Rio summit, Canada convened a forum in 1993 to discuss a common list of criteria and indicators to evaluate the conservation and sustainable management of temperate and boreal forests around the world. In 1994, a working group began to deliberate on the development of these criteria and

indicators, referred to as the Montreal Process. The criteria and indicators lay the foundation for linking regional, national, and international monitoring and reporting.

Criteria 6 and 7 address socioeconomic aspects of forest management. Criterion 6 focuses on maintenance and enhancement of long-term socioeconomic benefits to meet the needs of society. Criterion 7 addresses legal, institutional, and economic frameworks for forest conservation and sustainable management. Indicators for criteria 6 and 7 address production and consumption of forest products; recreation and tourism; investment in the forest sector; management for environmental, cultural, social, scientific, and spiritual needs and values; employment and community needs, including subsistence; opportunities for public participation in planning and decisionmaking; public education, awareness, and extension. These indicators standardize data gathering so that data can be aggregated across regional and national boundaries to monitor change. (The complete set of criteria and indicators and additional information on the Montreal Process are available at http://www.mpci.org.)

## Overview of Alaska History and Land Tenure

Alaska's Native people say they have inhabited Alaska "from time immemorial." Native communities were well established when Russian traders arrived in the mid-1700s. On October 18, 1867, the United States purchased Alaska from Russia and took ownership of approximately 375 million acres, an area about one-fifth the size of the continental United States. Although the purchase was not universally supported, at 2 cents an acre, most regard the purchase price a bargain, even at the time. On a recent visit to Alaska, Former Russian President Boris Yeltsin was said to have joked that "Catherine the Great should have her honorary title stricken from her legacy for selling Alaska to the United States" (Petty 2005: A10).

Alaska is blessed with an abundance of natural resource wealth. Prior to the U.S. purchase, Russians reaped wealth from furs, almost decimating fur seal and sea otter populations. Gold was discovered in 1880, and early miners removed large amounts of gold, copper, and silver. Several mines scattered throughout the state are active today. The first commercial salmon cannery in Alaska was built in 1878, and by 1889 there were 37 canneries in the southeast region, Cook Inlet, Kodiak Island, and Bristol Bay (Borneman 2003). Commercial fishing continues to be an economic mainstay (fig. 4).

Figure 4—Commercial fishing is an important component of Alaska's economy. Photo by Linda Kruger.

In the 1950s, two large pulp mills were completed in southeast Alaska based on 50-year contracts that guaranteed a timber supply. The contracts provided jobs and contributed infrastructure to southeast communities into the 1990s when the mills closed. The Prudhoe Bay pipeline, completed in 1977, enables Alaska's rich oil reserve to flow to Valdez to be shipped out of the state. The other solid leg of Alaska's economy is tourism—the only private sector industry to grow continuously since statehood (fig. 5). This industry is also built on Alaska's rich natural bounty—most visitors come to see the vast dramatic and spectacular scenery and land and marine wildlife. In addition to the benefits of revenues, infrastructure, and jobs, social and environmental costs are associated with each industry.

With statehood in 1959, Alaska was granted 28 percent of the land by the federal government. Along with other grants to support schools, universities, and mental health, the state received approximately 105 million acres. The passage of the Alaska Native Claims Settlement Act (ANCSA) in 1971 conveyed title of 44 million acres to Native corporations. Some individual and family claims have yet to be conveyed. Private land, including Native land, accounts for about 12 percent of the state's land.

The federal government manages 222 million acres or 60 percent of Alaska's land. Federal land is managed as national parks, preserves, wildlife refuges, national forests, military reservations, and the North Slope National Petroleum Reserve. There are 48 designated wilderness areas in Alaska encompassing

Figure 5—Cruise ships bring close to a million visitors to southeast Alaska each summer. Photo by Linda Kruger.

57,522,294 acres, or 54 percent of the Nation's total wilderness acres. Various federal and state agencies and Native corporations engage in land management. The mix of federal, state, Native, and private land and associated management entities creates a challenging mosaic for understanding how resource management affects communities and community-forest relations.

## Social Science Work in Alaska

Since the early 1970s, social science research in Alaska has addressed the nature and distribution of values and uses associated with natural resources. Much of this work has been an effort to understand interconnections among resources, resource management, and social and cultural change. Some of the earliest social science research in Alaska focused on recreation and tourism (Alaska Department of Natural Resources 1964, 1967; Clark and Lucas 1978; Clark et al. 1971; Muth and Fitchet 1976; Rich and Tussing 1973; Thomas and White 1974). Research on recreation and tourism continues today (Colt et. al 2002). Recent work has expanded to include community social and economic assessments (Allen et al. 1998, Crone et al. 2002), trends in mining and timber (Gilbertsen and Robinson 2003), trends in fisheries (Gilbertsen 2003), subsistence (Wolf 2000), migration (Williams 2004), community attitudes toward tourism (Cerveny 2005), and social change (Kline et al. 2005). Recent work in southeast Alaska is summarized in Crone (2004) and Mazza and Kruger (2005).

The Forest Service is moving to a more holistic and socially oriented approach to land management. In Alaska and the Pacific Northwest, the agency is responding to a decline in timber harvesting and wood products manufacturing and an increase in a service sector dependent on amenity values of forests. Forest productivity and sustainability have expanded beyond growing trees for wood products to include all ecosystem services provided by forests including recreation, tourism, and highly desired human habitat. These changes have focused attention on the contributions social science research can make to resource planning and management activities.

Changing social, economic, and biophysical conditions mean that ongoing studies are needed to provide relevant, timely, and useful information for planning and decisionmaking. These changes may be biophysical (such as climate changes) or economic (such as shifting international market conditions) or social (such as a fall in tourism following a terrorist attack). Public entities with the ability to track diverse data sets for numerous communities could play an important role in helping communities reorient around broad-scale changes.

Global climate change is having noticeable effects, particularly in some Arctic communities that are experiencing eroding coastlines and melting permafrost. In other regions there is speculation that changes in biophysical conditions such as insect outbreaks, yellow-cedar decline, and severe fires are related to climate change.

Southeast Alaska communities are in transition from the large, long-term timber contracts to an increasing reliance on service-sector jobs accompanied by a growing awareness of the broad range of ecosystem services provided by the forest. We might hypothesize that as awareness of the multiple values provided by the forest increases, public attitudes toward management of the forest might change. Longitudinal studies that enable analysis over time could document how public attitudes and uses of the forest are changing, identify trends, and analyze implications for communities and management agencies.

Social science research is an important component of sound, responsible resource management and community development. Although we can and should learn from research done outside the state, there are issues and questions distinctly linked to Alaska's unique sociocultural, geographic, and political situations that require research tailored to Alaska. In some cases, the questions may not be unique to Alaska, but the implications may be quite different from other places. Alaska provides an opportunity to study certain interactions and processes more easily than in other locations. For example, the recent bark beetle outbreak on the Kenai Peninsula provided an opportunity to understand why

communities responded differently both to the outbreak and the management response (Flint, in press).

Alaska research can contribute to understanding of community structure, demographic change, and the effects of resource management decisions on communities. Alaska has the second fastest growing older population in the country. A recent report found that the number of older residents in Anchorage, Alaska's largest city, is growing at five times the national average (Goldsmith et al. 2005). The study suggests that by 2020, Anchorage's over-65 population will almost double to 11 percent of the total population. Natural resource managers will be interested in the implications this older population might have for public lands and resources.

Alaska provides a unique opportunity for social science research. Alaska is one of few places in the United States with intact indigenous populations, many living on traditional homelands. There are few comparable study sites available outside the state to explore traditional ecological knowledge and subsistence lifestyles. There are opportunities to coordinate research at the international level on topics such as tourism, amenity migration, and second-home development; community development; and effects of climate change on communities. Small communities in Canada and other circumpolar countries and Mexico, are faced with many of the same challenges as communities in Alaska. Such studies would enable comparisons across differences in culture, land tenure situations, and management approach illustrating differences and similarities, implications for managers, and lessons learned for communities. An example of an immediate opportunity to work with partners across international borders is work with Canadian scientists on community sustainability and global climate change.

**Alaska provides a unique opportunity for social science research.**

## Understanding the Relations Between Communities and Forest Environments

> You think because you understand *one* you must understand *two* because one and one makes two. But you must also understand *and*. (Meadows 1982: 23).

Communities are social systems embedded in ecosystems. All ecological processes and structures are multiscaled (Allen and Hoekstra 1992) with upper levels providing context and lower levels having direct and indirect effects on upper levels. Communities are nested within each other as well (Beckley 1998) requiring multiple levels of analysis. Interconnected social and biophysical systems are constantly changing and influencing each other, sometimes in

unexpected ways. Forest ecosystems in Alaska are important as places where people live, work, and play. They provide a variety of benefits including goods, services, and uses that contribute to the well-being of individuals and sustainability of communities. Managing public forests in a responsive, responsible, and sustainable way that contributes to individual and community well-being requires understanding the complex relations that exist between communities and forests (Blahna et al. 2003, Kruger 2003).

The research proposed in this problem analysis responds to this need to understand the changing and intertwined relations between communities and forests in Alaska by looking at the area of intersection of social and biophysical systems (fig. 6). An effort will be made to focus on integrative questions within the overlap of biophysical, economic, and social systems. It is important to identify key variables in each realm in order to focus data collection and analysis and foster collaboration across disciplinary lines. Understanding the "and" means understanding relationships. This includes knowing how people use and value the forest, the goods and services the forest provides, the benefits people receive, what people know and care about, and the effects of resource management decisions and activities on communities.

Effective and responsive resource management recognizes the value of multiple types of knowledge (e.g., scientific, managerial, traditional) that can

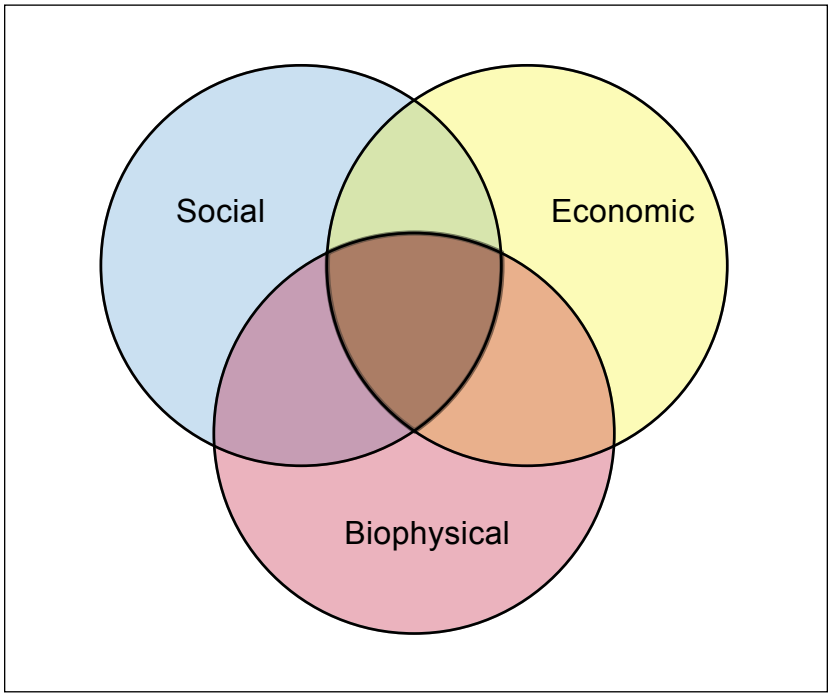


Figure 6—Communities and forests in Alaska are intrinsically linked in interconnected social, economic, and biophysical systems.

inform decisions. In Alaska, for example, understanding the role of stories and the importance of places in documenting knowledge is especially important because Alaska Native cultures and other long-time residents have had close connections to the land for generations, and because oral tradition through stories has proven to be an effective way of sharing and perpetuating those connections within and beyond Alaska Native communities. The research proposed here can help identify and access knowledge and design processes for integrating the full spectrum and diversity of knowledge into decisionmaking.

The Alaska Communities and Forest Environments Team explores issues and questions that inform and focus discussion on opportunities for communities and forest managers to work together to support healthy, resilient, sustainable communities and forests. The selection of research questions will consider the need to advance knowledge along with relevance and management implications of knowledge, frameworks, and tools to address management issues. Competitive advantage and capacity to accomplish the work will also shape the research that is undertaken. The team will initiate integrated sociological and economic analyses of the relationship between people at the community and organizational level and natural resources and the environment. Market and nonmarket community benefits such as recreation, tourism, and other ecosystem services provided by national forest lands are primary areas of focus. The team will maintain the flexibility to respond to research opportunities posed by unanticipated funding and opportunities for partnerships and collaborative activities.

## Disciplinary Orientations

Forests and communities are interconnected systems. Many research questions require an integrative approach that involves social, economic, and biophysical sciences (Driver et al. 1996). Integrative questions also promote collaboration with other scientists and managers. The team draws from several disciplinary orientations within the social sciences in order to respond to integrative questions. With a foundation in natural resource sociology, work will be informed by ecological economics, political ecology, cultural geography, and systems thinking as described below (fig. 7).

**Natural resource sociology**—
A traditional view in both social and ecological sciences held humans as separate from nature. Although many biologically trained scientists are reluctant to consider social aspects in their investigations, research and scholarship has demonstrated that humans are an inextricable component of ecosystems (Dunlap and VanLiere 1978, Pickett and McDonnell 1993). Recent works have emphasized

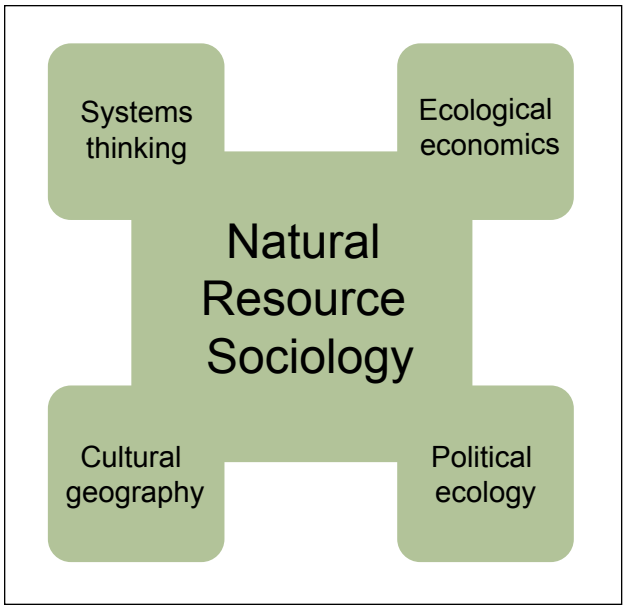


Figure 7—Disciplinary orientations.

the need to integrate social science with biophysical investigations to add to our understanding of the interplay between ecosystems and social systems (McDonnell and Pickett 1993). Natural resource sociology recognizes that community well-being and ecological well-being are closely linked, and thus research is needed that addresses "how people living in specific places make use of, develop meanings and attachments to, and are affected by the conditions of spatially proximate natural environments" (Luloff et al. 2004: 254).

Sociologists have been studying natural-resource-based communities and the human component of natural resources since the early 1960s. They have sought to "understand the adaptive strategies people use as they harvest forests, live within and adjacent to forests, and recreate upon lands set aside as forest resources" (Lee et al. 1990: 9). Even with almost 50 years of study, there is much still to learn about natural resource conditions and management issues as they relate to communities (Luloff et al. 2004: 254).

Natural resource sociology stems from a tradition of rural sociology and community and natural resource studies that recognizes natural resources encompass both biophysical and sociocultural phenomena (Fiery 1990). This approach supports the design and study of integrative questions that consider the social, economic, and biophysical components of an issue simultaneously. These are the questions found in the overlapping area in figure 6.

Natural resource sociology is well positioned to address questions that arise in this overlap area. Topics include changes in population composition, structure, distribution, and accompanying changes in public perceptions and use; potential effects of alternative policies and programs, especially in terms of equity and effectiveness; "structures and processes that mediate the relationship between and among people and their environment"; and processes that promote inclusion of social science in problem-framing (Stankey and McCool 2004: 27–29).

**Ecological economics**—
Ecological economics is a fairly new interdisciplinary subfield of environmental economics and ecology that explores the links between economics and biophysical systems to incorporate intangible ecological costs and benefits in traditional economic modeling, value/tradeoff assessments, and resulting decisionmaking (Patterson 2005). It assumes that human health and ecosystem health are inextricably linked (Patterson 2005). It assumes that the planet is finite and, therefore, the economy can only grow within the limits of the global ecosystem (Prugh et al. 2000).

Ecological economics expands our understanding of resource values to include the value of natural capital (producing a variety of ecosystem services) and helps us recognize that when we convert natural capital to manufactured capital we are trading one value for another. This approach brings attention to our methods for assessing and valuing the flow of ecosystem services that otherwise would not be accounted for (Prugh et al. 2000). An ecological economics approach integrates this information with other nonmarket attributes (such as social capital) to more accurately reflect the tradeoffs involved in natural resource management.

Ecological economics theory places the basis of sustainability on three theoretical legs: sustainable scale, efficient allocation, and equitable distribution (Daly and Farley 2003). Welfare economics, a branch of neoclassical economics, focuses on the allocation efficiency of an economy, and the income distribution associated with it. Whereas welfare economics uses microeconomics and the individual as the functional unit, ecological economics places greater emphasis on a sustainable scale in terms of macroeconomics, and the nonrival or nonexcludable goods and services that affect groups, communities, and societies as the functional unit. The gap between ecological economics and welfare economics can be addressed, in part, with an added emphasis on equity, community, and the intersection of social and natural systems (Patterson 2005).

**Political ecology—**
One aspect of political ecology seeks to expand the range of questions surrounding the relations between humans and their environment to include the distribution of asymmetrical costs and benefits that flow from development (Robbins 2004). The aim is to improve the conditions experienced by marginalized or socially disadvantaged groups.

Most political ecology work has focused on distribution of costs and benefits specifically among Third World communities and nations (Bryant 1992, 1998). Less attention has been focused on the distributional impacts within First World countries (McCarthy 2002). Topics addressed by political ecology include threatened livelihoods (Bryant and Bailey 1997), indigenous knowledge bases (Bryant 1998), gender and household resource control (Rocheleau et al. 1996, Schroeder 1993), and policies between nationally (Peluso 1992) and (to a lesser extent) internationally relevant institutions (see review by Bryant 1998). The political ecology analyses most closely related to the research proposed here have focused on tourism (Gossling 2004, Patterson and Rodriguez 2004, Stonich 1998) and land use conflicts in the West (Brogden and Greenberg 2003, Sheridan 2001), especially cattle ranching (Sayre 1999).

**Cultural geography—**
The focus of cultural geography is on understanding how people make sense of their physical environment. Topics explored from the perspective of cultural geography address socially constructed, intersubjective meanings, beliefs, attitudes, and symbols, and the processes by which these meanings are negotiated and contested (Jackson 1989). The goal is to understand how people make sense of the world and the events and opportunities they face daily. Cultural geographers offer insight into studies of people-place relations, community identity, and sense of place. Geographers suggest the best approach for exploring these topics is one that uses multiple investigators, theories, methods, and data sets (Eyles 1988).

**Systems thinking—**
Conceptual models related to systems thinking include adaptive governance, adaptive management (Deitz el al. 2003), integrated assessment (Kasemir et al. 1999, Rotmans and van Asselt 2001), general systems theory (Forrester 1968, Meadows 1997, von Bertanffy 1968), and living systems theory (Capra 1996). To address the challenges of sustainability, it is necessary to blend factors of cause and effect in a model that addresses natural resources and human interactions (Kaufman et al. 1994). Conceptual models also are important tools for

identifying polarizing issues before they arise, underscoring the importance of early integration of social science in natural resource management strategy.

Living systems theory, one branch of systems thinking, focuses on structure (substance) and form (pattern) (Capra 1996). Quantitative measures are used to understand structure or substance. Mapping and describing relationships and their qualities illuminate patterns that are often of interest when studying social systems. Understanding social systems requires that we bring together perspectives about process and meanings as well as structure and pattern (Capra 2002). Incorporating the following six principles of living systems in research design supports emergent understanding of the structure, patterns, meanings, and processes of living systems (Reason and Goodwin 1999):

- Rich interconnections—Rich patterns of interconnections among components and networks that are self-organizing.
- Iteration—Repeated patterns of activity, ordered patterns, and networks.
- Emergence—New structures, patterns of activity, and forms of behavior at a high order arise from the activities and interactions of the component individuals and are irreversible.
- Holism—Emergent order is a consequence of interactions among elements; units of knowledge are interconnected wholes rather than separate things.
- Fluctuations—Iterative, nonlinear processes are characterized by fluctuations, which can signal emergence.
- Edge of chaos—Where emergence occurs, where a system is most robust and responsive to change; although uncomfortable for many, this is the best place to be in an uncertain and unpredictable world (Kaufmann et al. 1994).

**Reframing a problem by using conceptual models can motivate innovation and rethinking.**

The questions outlined in this problem analysis seek a balance between analysis (breaking down a problem into its component parts and understanding how they function) and synthesis (the ability to put pieces back together in a creative way to solve problems). Both are necessary to address difficult and complex linkages between humans and natural resources (Costanza 2003). Reframing a problem or polarized argument by using conceptual models can motivate innovation and rethinking. Conceptual models may help identify needed science and place it in the context of multiple perspectives. In turn, this can be used to help manage conflict and promote new collaboration (Tannen 1999).

The combination of these approaches will enable the team to explore multiple dimensions of the relations among human communities, natural resources/forest ecosystems, and forest policy and management.

## Research Design and Methods

### Research Traditions

Social science research searches for answers to who, what, when, where, how, or why questions that involve people. For example, a survey (a quantitative strategy also referred to as a fixed design) usually is used to answer questions asking how many, how much, where, and who. In a fixed design, data are almost always in the form of numbers and often are reported by using statistics. Fixed-design strategies include surveys, experiments and quasiexperimental strategies (in which the scientist tries to not change the circumstances of the situation being studied). Fixed designs require a firm, highly structured design framework with "high compatibility among purposes, theory, research questions, methods and sampling strategy" (Robson 2002: 82).

Answers to questions asking how, why, and what are more easily addressed by using a flexible design that is informed by and evolves during data collection. Most of the questions raised in this problem analysis require flexible-design strategies. Data in a flexible design are almost always in the form of words; however, descriptive quantitative data are often incorporated.

The research proposed in this problem analysis can be addressed most appropriately by using one of three common design strategies: case study, ethnographic study, and grounded theory. A case study develops knowledge of one case of something or a small number of related cases that can be compared and contrasted by using multiple sources of evidence (Ragin and Becker 1992). Ethnographic study answers questions about "how a group, organization or community live, experience and make sense of their lives and their world" (Robson 2002: 89). Grounded theory mixes data collection, analysis, and theory development throughout the study to try to generate theory or insights (Robson 2002, Strauss and Corbin 1997). These strategies are complementary and can be used together.

### Research Methods

Various research methods—techniques to collect and analyze data—are available to carry out this research. Once a research question is defined, an appropriate strategy and method(s) is selected. Often the strategy will entail using multiple methods, also referred to as triangulation. In addition to multiple methods, triangulation may refer to using multiple sources of data, multiple investigators, and/or multiple theories (Denzin and Lincoln 1988).

Methods include observing people, asking them questions—either in writing, over the phone or Internet, or in person—and reviewing secondary data such as census data or documents. Any particular method or approach has

both strengths and weaknesses. Using multiple methods enables a scientist to respond to related questions within the same study, takes advantage of strengths and minimizes impacts of weaknesses of any one particular method, and can increase the accuracy of interpreting the data (Robson 2002). Using a combination of methods, particularly combining qualitative and quantitative methods, can strengthen confidence of a finding and broaden the range of generalization. The choice of method depends on the research question, the type of information desired, the circumstances under which the study is being conducted, who the information will come from, and often the skills and expertise of the scientist.

Observation is useful in determining what people do in public, whereas interviews and surveys or questionnaires help reveal what people do, think, or feel. Focus groups are group interviews that are focused on a particular topic or issue with a scientist or other moderator guiding the group discussion. Content analysis of documents is used to make inferences from the data and to explore the relationship of the data to the institutional, social, and cultural context the document was prepared in. Content analysis can be used with public comments, newspaper and magazine articles, speeches, and other documents.

Studies are often conducted at one point in time, providing a snapshot that does not identify trends. The same study, however, repeated under similar circumstances at a different point in time, can examine how things change and lend further confidence in results, as well as new information. A comparative analysis, accomplished when the same study is carried out over multiple locations or across multiple groups enables comparison across cases. A panel study involves asking the same group of people the same questions at different points in time, but these studies tend to be difficult and expensive to conduct.

## Multiple Approaches Needed

Formal studies are only one of several approaches that will be needed to carry out this research agenda. In his program charter for the People and Natural Resources Research Program, then Program Manager, Roger Clark developed a list of approaches that suits the flexible design focus of this research agenda quite well. This section, excerpted from the program charter (Clark 1996), suggests six types of approaches. First, synthesis is an approach that involves the integration and interpretation of existing knowledge (either published, unpublished, or based upon experience) by means of state-of-the-art analyses and literature reviews, modeling, etc. The end products include state-of-the-art guidelines and improved definition of areas needing further research or development. The second approach involves the development of new concepts, frameworks, and

tools to aid the managers and the public in resolving problems. Formal studies, including baseline/descriptive studies, can improve understanding of the existing state of conditions and the values and concerns underlying problems. This third approach includes analytical and experimental studies focused on questions of why and what might be and questions that focus on interrelationships. Fourth, demonstration projects involving on-the-ground applications of state-of-the-art knowledge, tools, and concepts, coupled with formal monitoring and evaluation programs are an appropriate response to some questions. Fifth, forums that provide an opportunity for indepth discussion and exploration of critical or controversial issues are often an appropriate and effective response. Such forums may lead to the identification of needed research studies and demonstration opportunities. Finally, communication and transfer of information through specialized courses, seminars, and workshops are often an important way to convey information to managers. These approaches will be applied as part of the studies outlined here as appropriate.

## Areas of Focus

> Alaska's grandeur is more valuable than the gold or the fish or the timber, for it will never be exhausted. This value, measured by direct returns in money received from tourists, will be enormous [Gannett 1901: 277].

### Communities in Transition

Resource-dependent communities in Alaska are in various stages of transition, reflective of broad-scale changes across the country. Resource extraction and manufacturing are declining while service industries and unearned income (retirement, dividends, and other nonwage income) become increasingly important to local economies (Robertson 2004). The changes communities are experiencing are intertwined with, and influenced by, changes in the natural environment, natural resource management, and resource markets. Across the country and across the state, communities are responding to global, national, and local change with a variety of strategies. Understanding the underlying causes and consequences of change for communities and the factors that lead to community response interests those responsible for community well-being and forest management.

Lack of understanding of relations between communities and forests has aggravated and polarized the debate about appropriate forest management strategies for years (Cheng et al. 2003, Power 1996, Wondolleck 1988). The result

Figure 8—Alaska's scenic landscape draws visitors and retains residents. Photo by Linda Kruger.

has been conflict and confrontation among and within communities and between communities and resource management agencies. The complex and dynamic nature of these issues is difficult to understand in cross-sectional, or discrete, analyses; the resulting conflict limits the ability of agencies to implement integrated ecosystem management and hampers the ability of research and management to address important resource issues.

The importance of understanding the community as a whole and the implications of the nestedness (Beckley 1998) of communities—communities are embedded within each other at different scales—are often lost in polarizations that emphasize single issues and complexities that reinforce the status quo. Rising tensions often culminate in land management problems. We suggest here that many of these could be foreseen and better managed by facilitating public discourse on perceived costs and benefits, coupled with some systematic examination of whether those impacts are equitably distributed. It is important to note that these costs and benefits may be anticipated or unanticipated, direct or indirect, transparent to the democratic process or otherwise obscured. Carrying out the work proposed here could help managers better understand and ameliorate these conflicts and improve benefits to communities.

Alaska provides an opportunity to explore the relationship between environmental and social change in a variety of ecosystems from the temperate rain forests of southeast to the polar Arctic. Northern forest ecosystems are among the most at risk to the effects of climate change (Saporta et al. 1998, Singh and Wheaton 1991, Wall 2004). Climate change and related ecosystem disturbances including insect and disease outbreaks and fire have largely unknown implications for social change (Davidson et al. 2003). Social science research in Alaska that addresses climate change will contribute to an international effort to better understand the effects and implications of climate change for residents of northern communities.

Improving our understanding of the relations between communities and natural resources will inform and improve management decisions and increase our understanding of social and cultural acceptability of resource management activities (Brunson et al. 1996). Understanding the variety of characterizations and uses of forest resources requires attention to communities, economies, institutions, and organizations (fig. 9). Without an understanding of these relationships and their importance and meanings it is difficult to develop and implement appropriate and acceptable policies and management practices.

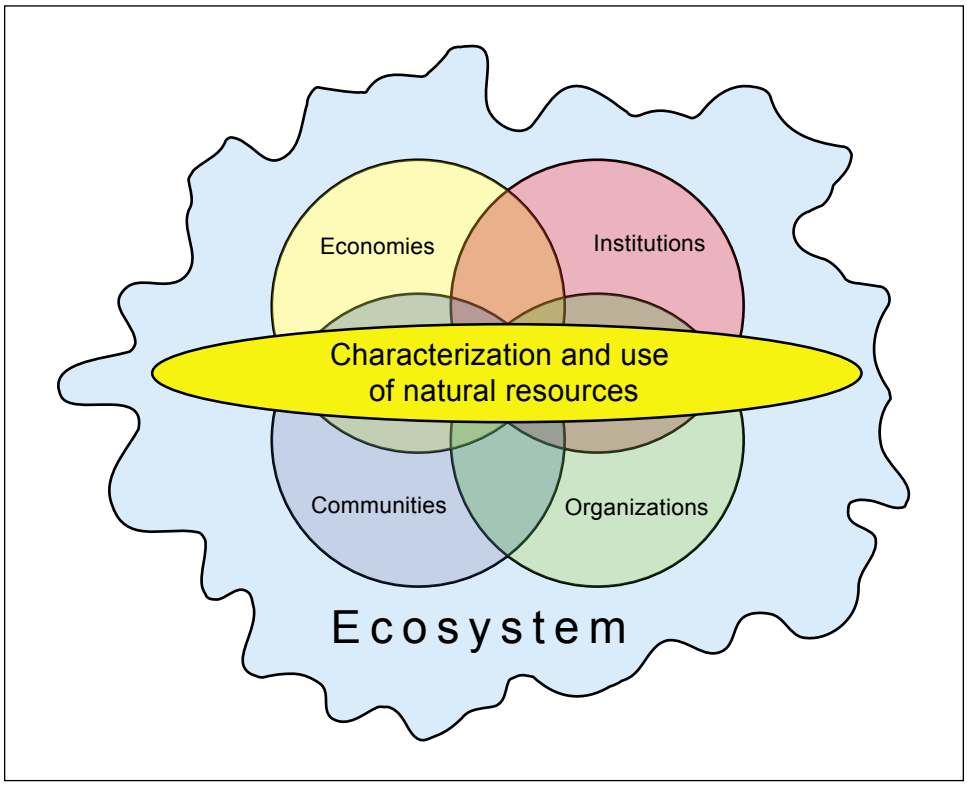


Figure 9—Characterization and use of natural resources across communities, economies, institutions, and organizations.

Land managers have a valuable role to play in helping communities evolve in a manner that is socially just and environmentally sound and reach solutions that are equitable within and across generations. How public lands are managed influences the perceived scenic or recreational value of an area. This, in turn, influences the type and amount of tourism to the communities serving as gateways to public land. By managing public lands in a way that encourages tourism, maintains scenic values, and provides recreational activities, public land agencies can influence the amount and type of tourism and the role of tourism in community development (Crone 2004, Robertson 2004).

**How public lands are managed influences the perceived scenic or recreational value of an area.**

The controversies that surrounded forest management during the 1990s suggest the need for a more comprehensive strategy for improving social well-being of local residents that includes a wider range of forest goods and services. A political ecology examination of community challenges can help agencies understand and respond to the evolving expectations and needs of nearby communities in their planning and management.

A major accomplishment of the research effort described here will be working with communities to understand transition strategies and the propensity of communities to manage and adapt to change (Beckley et al. 2002, Grigsby 2001, MacKendrick and Parkins 2004). Special attention will be given to increasing public understanding of the wide range of forest goods and services accounted for in this reorientation. A second accomplishment will be to expand our understanding of the role that forests and forest management play in the economic prosperity and social well-being of a region and its communities. Third, we will develop improved understanding and design tools and techniques to expand and improve participation in decisionmaking and stewardship processes.

As the management focus on Alaska's forests shifts from timber production to providing an array of forest-based amenities, ecosystem services, and lifestyle benefits for local residents and visitors, managers will be challenged to "maintain the ecological integrity and natural character of the forest while accommodating the demands of different user groups" (Robertson 2004: 30; see also work on reconciliation ecology [Rosenzweig 2003]). In response to this shift, research will address valuation of ecosystem services including noncommodity goods. This is particularly important in Alaska where household noncommodity natural resources use is as high or higher than other parts of the United States (fig. 10).

Research on communities in transition responds to several priorities established by the PNW Research Station (USDA FS 2002): (1) to improve understanding of social and economic processes and their interaction with natural resource values and uses; (2) to restore ecosystems at risk and reduce risks to

Figure 10—Forests provide an abundance of berries for recreation, tourism, and subsistence gathering. Photo by Linda Kruger.

people; (3) to develop recreation and tourism options; and (4) to produce wood within sustainable frameworks. It is also aligned with HNRI Program problem 4, seeking to improve our understanding of community-natural resource interactions at multiple scales. Problem 4 includes improving understanding of the effects of knowledge, values, and meanings on natural resource use, and how these affect and are affected by natural resource management. Research on communities also responds to a Forest Service Alaska Region (Region 10) goal to "enhance the health, stability, quality of life, economic vitality, and adaptability of communities in south-central and southeast Alaska and natural resource dependent communities throughout the state" (USDA FS 2003).

**Potential research**—

Communities respond and adapt differently to change in both the short and long term. Frameworks and processes could help communities identify shared values, resources, opportunities, and desired and undesired change. A protocol for enhancing community capacity to develop, store, and use local knowledge as a way to improve mutual understanding among scientists, managers, and citizens of the effects of forest policy and management would benefit communities and resource agencies. Community self-assessment, monitoring, and other civic

science activities may be one approach to improving understanding. Design and implementation of a community assessment process and monitoring framework would be of practical benefit to managers and communities. A community self-assessment process also provides an opportunity to engage the community youth in learning about their community and its relation to the forest (Kruger and Shannon 2000).

Learning more about how communities use and value forests would enable scientists and managers to understand possible effects of management decisions and actions. Identification of social linkage indicators and tools for organizing and analyzing social linkage data would benefit managers as they develop and implement policy (Endter-Wada et al. 1998).

Communities face a variety of changes. Communities face changes brought on by increased access to Anchorage and the road system via ferry (Cordova), reduced access from reduced ferry service (Seward), reduced timber harvest activity and increased access (Prince of Wales Island communities), reduced barge service for delivery of goods (Gustavus, Tenakee Springs, and Pelican), fluctuating cruise ship arrivals (Haines, Sitka), changing demographics (Anchorage, southeast), and effects of global climate change. What is the Forest Service's role in fostering community socioeconomic health and development? What would appropriate community development activities entail? Working with communities on participatory community assessments and other joint studies has the multiple benefits of building social capital while identifying paths of opportunity for joint agency-community efforts.

As a society, we are changing how we think about, use, and manage our national forests. Once a major source of wood products, forests in Alaska are increasingly recognized for their ecological, aesthetic, and cultural values. Tourism and recreation have become the dominant use of these forests, and it is important for managers and policymakers to explore what this shift means both in terms of resource management and effects on communities. What is the value of ecosystem services provided by the forest? How can management better position itself to respond to changes in market conditions and shifts in the perception and valuation of these forests and the goods and services they provide? What information is needed to help in this realignment, and how can we obtain it? What institutional factors are important in developing an effective response to change? What are the determinants of amenity migration, and how does migration affect community social and economic well-being and social justice?

Many communities are experiencing shifts in population level and composition and in their relation to natural resources and the landscape. We do not

fully understand the processes leading to these changes and the potential consequences for communities and resource management (McCool and Kruger 2003). We do not know what these changes mean for participation in deliberation of management strategies, expectations of forest management, social and cultural values, and the manner in which residents and nonresidents relate to, use, and define natural resources and places on the landscape.

Globally, awareness of the importance of achieving sustainable communities is increasing. Discovering what this means in Alaska will require collaboration across all levels of government, among agencies and Native corporations, organizations and communities, and will need to engage citizens across the state. Research is needed to better understand how resource management decisions and actions affect community capacity, resilience, well-being, and sense of place. Understanding a community's social, human, physical, natural, cultural, and financial capital will increase the ability of managers to implement management actions that support local communities and help build the community's capacity to evolve with and adapt to changing conditions.

## Collaborative Planning, Decisionmaking, and Stewardship

Collaborative place-based planning is emerging as a useful and effective approach to integrated forest planning (Cheng and Kruger, n.d.a). This approach facilitates multistakeholder involvement in defining meanings and expectations for the landscape as a whole, in contrast to the traditional interdisciplinary team resource-by-resource approach. The process enables planners to integrate across issues. It incorporates stakeholder values, uses, and expectations for the landscape, focusing on meanings and what is important to people about specific places. Collaborative planning builds relationships and discloses meanings that can help set the stage for collaborative stewardship projects and even co-management (Cheng and Kruger, n.d. b; Daniels and Walker 2001; Wondolleck and Yaffee 2000), or community forests (Baker and Kusel 2003). Exploring the use of these processes with stakeholders can help managers and stakeholders collaboratively design and implement innovative management approaches that respond to community and ecosystem needs and contribute to management and collaborative stewardship while they prepare for the next round of forest planning (Keough and Blahna, in press).

Research on collaborative planning and stewardship is related to PNW Research Station priorities to improve understanding of social and economic processes and their interaction with natural resource values and uses (priority 1.3); to restore ecosystems at risk and reduce risks to people (priority 3.2);

to develop recreation and tourism options (priority 3.3); and to produce wood within sustainable frameworks (priority 3.4) (USDA FS 2002). Research within this focus also responds to Station priorities to conduct inventories of forest resources and uses (priority 2.1); to respond to emerging issues (priority 4.1); and to bridge the gap between information generation and its use (priority 4.2).

At the program level, research on collaborative planning and stewardship responds to problem 3 of the HNRI Program charter, addressing institutional structures and processes that might impede or facilitate collaboration among professionals and between professionals and the public (HNRI 2002). It is also in alignment with problem 4 of the HNRI charter that addressess improving our understanding of community-natural resource interactions at multiple scales, understanding the effects of knowledge, values, and meanings on natural resource use, and how these affect and are affected by natural resource management. Research on collaborative planning and stewardship also responds to two Region 10 goals: (1) "to enhance the health, stability, quality of life, economic vitality, and adaptability of communities in south-central and southeast Alaska and natural resource-dependent communities throughout the state" and (2) "to enhance the health, productivity, and diversity of the forests in Alaska" (USDA FS 2003).

**Potential research—**

Traditional forest planning and management is based on scientific, technical approaches (Cortner et al. 1996, Kruger and Shannon 2000). The results of these efforts have not always been acceptable to the public (Cheng et al. 2003, Kemmis 1990). The current debate about appropriate and acceptable forest management strategies is often aggravated and polarized. Failure to improve our understanding of community-forest relations and to improve mechanisms for involving communities in forest management may lead to a continuing sense of gridlock or escalating conflict with high financial, social, and ecological costs. An alternative view, becoming more prevalent, proposes to combine scientific and technical knowledge with local, experiential knowledge held by people who live, work, and play in a place and who perceive their livelihoods, lifestyles, and values will be affected—and often negatively impacted—by resource management decisions (see Keough and Blahna, in press).

Local residents often have knowledge and understanding of a place and an orientation to a place that agency employees do not (Kruger and Shannon 2000). By involving the community in planning, research, and management activities, the agency will gain access to local knowledge and understanding while sharing their knowledge with the public. Ecosystem and adaptive management integrate

health, sustainability, and productivity of both biophysical systems and human communities. Research can help identify and develop tools to integrate communities and community knowledge in forest management processes.

Not adequately considering experiential knowledge, sometimes referred to as social knowledge (including traditional ecological knowledge [TEK]), along with scientific knowledge, and not providing opportunities for shared learning where people can exchange knowledge and formulate decisions together (Daniels and Walker 2001) often results in administrative and legal challenges and a diminished level of trust (Kruger 1996). A lack of understanding of the relations between human communities and forest ecosystems has fueled this contentious situation. Research can help explain factors important in assuring that partnerships and stewardship activities are designed such that they increase community capacity and build trust. What institutional arrangements are needed to foster collaborative working relations?

Shifts in societal priorities for land use owing to changing markets, global unrest, and changing perceptions of ecosystem services (including goods) affect natural resource management (Baden and Snow 1997, Power 1996, Tarrant et al. 2003). At the same time, citizens are demanding a greater role in management decisions that they see affecting them (Sagoff 1997). Opportunities for citizen participation in planning and stewardship activities at the community scale provide opportunities for more meaningful participation and capacity building than activities at the state or region level. Forums, processes, and opportunities are needed (or need to be documented and shared) that create an environment that motivates interest and participation. How can research assist managers in anticipating, preparing for, and responding to shifting priorities for land use? What management approaches could incorporate both positive contributions to local communities and natural resources?

Communities (the focus of the work described here), social groups, and individuals often develop meanings for, attachment to, or identity with particular places. This sense of place, as it has come to be known, may provide a stimulus for people to engage in forest planning, development of community wildfire protection plans, and other stewardship and community development activities. Creating venues for meaningful citizen involvement is often more difficult than it sounds. Research is needed to design and evaluate mechanisms and arrangements that improve opportunities for interaction and understanding among managers, scientists, and citizens through participation in ecosystem management and stewardship projects. It is often conflicting meanings or characterizations that lead to controversy over land management. Understanding these meanings can better

position managers to mediate and mitigate across meanings. Understanding concepts of place and sense of place may enable managers to better understand the meanings people attach to public lands and resources and how these meanings lead to controversy or positive involvement in stewardship and other activities.

## Tourism and Outdoor Recreation

In the recreation and tourism arena, managers need tools, strategies, and protocols for visitor management and monitoring and frameworks for understanding the interactions between recreation, tourism, and subsistence activities and other ecosystem services. Some Alaska communities are interested in developing cultural, heritage, and ecotourism industries but have concerns that this development may have unexpected social and economic impacts. Communities need tools that will help them identify desirable, feasible, sustainable tourism and recreation that responds to changing tourism and recreation uses and patterns—and an understanding of these changing uses and patterns.

Outdoor recreation and tourism is one of the Alaska Region's five emphasis areas (USDA FS 2003). The Region's aim is to define and promote sustainable levels of high-quality recreation and tourism while maintaining outstanding settings and wildland character. Dovetailing with this goal, PNW priority 3.3 is to develop recreation and tourism options for diverse populations.

Public lands are a magnet for recreation and tourism activities (figs. 10, 11, and 12). The aura of Alaska is itself an attraction. Recreational opportunities also contribute to the quality of life for residents. Tourism, recreation, subsistence activities, commercial fishing, and other uses of public lands and waters form a complex and everchanging mosaic. Rapid growth in cruise ship- and tour boat-generated tourism is impacting resident recreation and subsistence activities causing residents to move into new areas to avoid large numbers of tourists. Tourism, resident recreation, and subsistence activities often involve shoreline use (fig. 13). Although the shoreline in coastal Alaska may seem unlimited, most sites are not physically suitable for shore-based activity. Heavy use in some areas raises concerns about experience quality and displacement of residents to fewer and more remote areas (Cerveny 2005). We lack an adequate understanding of the variety of social challenges and social, cultural, economic, and ecological changes that accompany recreation and tourism development (Brooks and Haynes 2001).

**We lack an understanding of the social, economic, and ecological changes that accompany recreation and tourism development.**

The tourism sector has grown steadily since 1990 and is expected to continue growing (Fried and Windisch-Cole 2004). Many Alaska communities see tourism as a necessary component of a healthy economy, while at the same time they are

Figure 11—Bear viewing is increasingly popular. Photos by Linda Kruger.

Figure 12—Visitors and residents enjoy water-based recreation. Photo by Linda Kruger.

Figure 13—Shorelines are important as an interface providing access between water and upland activities. Photo by Linda Kruger.

concerned about the impact of increasing levels of tourism on the quality of life and the environment (Cerveny 2005). Although communities want the benefits of jobs and business opportunities, most do not want to sacrifice community culture and identity, access to subsistence resources and resident recreation, environmental quality, or privacy.

The social effects of tourism are not experienced uniformly across Alaska communities or segments of the population. The size of the local tourism industry, stage and type of development, and its growth rate affect the social impact of tourism. These factors have implications both for communities and forest management. "Alaskans will need to think through and discuss what forms of tourism access are most compatible with resource protection, a healthy economy, and their own quality of life" (Colt 2001: 48). It is imperative that forest managers and community leaders talk about their concerns and design ways to work together more effectively on tourism issues related to communities.

Tourism-related concerns include commercial use of trails and parks; increasing potential for human-wildlife conflicts; management of bear-viewing and other wildlife-oriented facilities; development of large lodges and other seasonal businesses; control of businesses by out-of-town interests; interference with commercial fishing and subsistence activities; increasing numbers of people in remote places; loss of small town identity, culture, and character; sustainable tourism activities; increasing property values; and affordable housing.

**Potential research**—
Tourism may have the potential to diversify the economy of some communities. There is an opportunity to work with communities, particularly smaller communities, in identifying and exploring tourism opportunities and evaluating how these align with community vision. Some communities are already seeing large numbers of cruise ship arrivals. As the number of tourists arriving by cruise ships increases, so do questions about the biophysical, sociocultural, and economic impacts associated with this industry. It is important to understand the expectations of visitors, how these expectations will be satisfied, and the implications for local communities.

The effect visitors and their activities have on natural resources (e.g., water and air quality, riparian areas, bears, and whales), community infrastructure, community identity, cultural traditions, local businesses, and other threads in the complex fabric of the community is of concern and interest to community leaders. Research is needed to help explain the interactions among tourism, resident recreation, subsistence activities, and other aspects of community culture and resource management and the implications of each for the other.

Understanding guide and outfitter businesses—where clients come from, where guides and outfitters live and work, contributions of commercial activities and businesses to local communities, demand for different types of activities, client expectations, and unmet demand—can help agencies understand current and potential use and benefits to communities.

Part of the allure of Alaska is its many designated wilderness areas. Many visitors are attracted by the images projected in travel brochures, newspaper travel sections, and travel and recreation magazines. Alaska offers an unmatched opportunity to study aspects of wilderness—wilderness as a highly contested idea, as a place, as an experience, as a land management category—with a variety of management agencies, modes of access, levels of use, types of activities, and management direction represented. Wilderness in Alaska provides opportunities for interdisciplinary work that incorporates biophysical, social, cultural, and economic aspects questions and study approaches. The Aldo Leopold Wilderness Research Institute based in Missoula, Montana, has a history of interagency, interdisciplinary research in designated wilderness areas in Alaska. We recognize the institute's competitive advantage based on past history and working relations and therefore have not proposed additional wilderness-related work as part of the research agenda for this team.

Little is known about management plans of nonfederal landowners (state and private) who own land adjacent to federal land (Brooks and Haynes 2001). Native corporations with land holdings in excess of 44 million acres are expanding their tourism holdings, for example. Better knowledge of what kinds of tourism development are planned for private lands could help public land managers anticipate demand for and potential effects on adjacent public land.

**We know very little about trends in resident recreation.**

We also know very little about trends in resident recreation. Research is needed to help identify travel patterns; trends in supply and demand of facilities and opportunities; where crowding and use are impacting the environment, communities, and individual experiences; and where and how tourism is affecting recreation. A better understanding of visitor characteristics, recreation, and tourism businesses; residents' attitudes about tourism growth; collaborative tourism planning; social, economic, and environmental effects of tourism; patterns of use; and carrying capacity is needed.

Managers are asking for help in answering a number of questions including the following: What is the Forest Service's role in tourism? What types of tourism should the agency encourage, accommodate, restrict, or prohibit and where and for what reasons? What visitor management is appropriate in areas that accommodate tourism, resident recreation, and subsistence uses? Should the

agency create noncommercial zones? Should tourist activities be concentrated or dispersed? Should the forest be zoned by activity? Should agency land be leased for commercial development? How should priorities be determined? Should existing facilities be maintained or expanded, and when should new facilities be developed? How can tourism be managed so that the well-being of communities is maintained and even improved? What does sustainable tourism look like? How can effects on subsistence and other cultural activities be minimized?

## Cultural Orientations to Natural Resources

Finally, Alaska offers a unique opportunity to pursue collaborative research on cultural uses of forest resources, traditional relationships with the land, indigenous knowledge, indigenous property rights, and tenure systems in conjunction with indigenous communities and our neighbors in Canada.

Alaska Natives have inhabited what is now the state of Alaska for thousands of years. Interpretive sites celebrate and explain that history (fig. 14). Americans, who arrived to exploit the abundant fisheries and search for gold in the last half of the 1800s, followed Russian explorers and fur traders who arrived in the 1700s. Americans brought workers from other countries to work in the mines and canneries. More recently, timber resources and oil brought more workers to the state. Tourists began to arrive in the 1870s when John Muir and others wrote about the wonders of the state. The waves of outsiders, intensive development

Figure 14—The Point Sophia Development Company, a joint venture between Huna Totem (Hoonah's village corporation) and Koma Sales, a Juneau-based private investor, developed a tourist attraction near the town of Hoonah in 2002–2003 that includes a cultural center, hiking trails, and fishing museum. Photo by Linda Kruger.

and utilization of resources, and government policies and management practices challenged and changed the historical relationship of Alaska Natives and the land. (See Borneman 2003 and Weeden 1978 for an overview of the history of human exploration and development in Alaska.) Research is needed to improve our understanding of these changes and their interconnections.

Study of cultural orientations to and uses and values of natural resources responds to the Alaska Region's goal of incorporating the unique cultural heritage, legal status, and traditional knowledge of Alaska Natives into programs and processes (USDA FS 2003) while expanding beyond Alaska Natives in recognition that Alaska has become home to people from a variety of cultural and ethnic backgrounds (fig. 15). It also responds to the HNRI charter's elements 4.1 and 4.2 that address understanding interdependencies among knowledge, values, uses, and management at the individual and community level.


Figure 15—Filipino dancers perform in the Juneau Fourth of July parade. Photo by Linda Kruger.

**Potential research—**

As newcomers arrived over the years, relations to the land and natural resources changed. Understanding the historical and contemporary orientation of Alaska Natives to natural resources as well as the cultural orientations of the numerous ethnic groups that have become part of Alaskan society can provide managers an understanding of the demand for goods and services. It is important for managers to understand the implications of management decisions on different

social and ethnic groups. The effects on recreation and other uses when public land is acquired by Native corporations or allotment holders and closed to public use are unknown. Changing land tenure could have implications for recreation supply and demand that should be considered in forest planning processes.

Managers are confronted with a variety of questions as they strive to fulfill treaty and other legal obligations. In addition to manager's questions, the long history of Alaska Natives' relationship to the land provides unique research opportunities. There are opportunities to pursue collaborative research on cultural uses of forest resources, traditional knowledge, indigenous property rights, and tenure systems and to assess the role of traditional knowledge in contemporary approaches to forest management. What management strategies are sensitive to and help maintain cultural traditions and diversity?

**The long history of Alaska Natives' relationship to the land provides unique research opportunities on topics such as cultural uses of resources, traditional knowledge, indigenous property rights, and tenure systems.**

Traditional ecological knowledge, or TEK, is especially important in Alaska. "TEK may be viewed as being composed of three interrelated components: (1) specific environmental knowledge, (2) knowledge of ecosystem relationships, and (3) a code of ethics governing appropriate human-environment relationships" (Stevenson 1996: 278). Such knowledge is handed down through stories, dance, songs, art, and other cultural transmissions (Berkes et al. 1994). It may be challenging to integrate scientific knowledge with TEK in developing information that is useful to managers and the public.

There is an ongoing effort to understand subsistence use of fish and wildlife in Alaska, to describe and understand how relations to the land and resources are changing across cultures, and to provide tribal governments with assistance. To achieve this effort, it is important to continue to work with tribes. Foundational questions include: How has Alaska Natives' relationship to the land and traditional resources changed under the pressures of modern society? What future changes might we expect? What are the impacts of the growing tourism industry on subsistence resources and activities? How has forest management affected subsistence values and uses? What role does subsistence play in community well-being and resilience? The Forest Service needs this information in order to meet its responsibility to manage subsistence fishing and hunting on federal land and to comply with requirements to examine the effect of land use actions on subsistence uses. New knowledge of subsistence uses may inform understanding of changing subsistence patterns and the role subsistence plays in community well-being in other locations around the world. How are changes in subsistence use in Alaska similar to or different from changing patterns elsewhere in the world, and what contributes to the similarities and differences?

Additional work is needed to better understand the social, cultural, and ecological importance of key cultural sites associated with subsistence harvesting activities. What sites have maintained significance over time and why? Studies with tribal groups might explore links between TEK, cultural sites, and opportunities in the growing cultural tourism market. Which sites could be interpreted and celebrated with wider audiences, and which sites should be protected and unadvertised? Any future TEK work needs to be jointly developed by the tribes and a cooperating social scientist. There is much to be learned in the area of stewardship, property rights, and land tenure. For example, some activities of Native corporations, focused on market-driven resource extraction, challenge classic notions of native relationships with the land (Kruger and Etchart 1994), and emphasize the importance of both market and nonmarket approaches.

## Approaches to Achieve Objectives

This problem analysis identifies a broad range of research needs. It builds on existing programs of work and stresses exploration of policy-relevant and integrated questions that provide opportunities to demonstrate team scholarship. Many research questions are provided with the intention of stimulating thought and discussion about future research. To help in this effort, an extensive external research network will be established that includes people in the community. Pacific Northwest scientists, postdoctorates, technicians, and student temporary employees will accomplish work through a combination of cooperative and joint venture agreements with university and other collaborators, sabbaticals, and in-house work. We will pursue opportunities to leverage additional funding by identifying ongoing and proposed work within the Station, work that the region and other agencies are interested in supporting, and outside funding opportunities.

Funding opportunities such as those provided through the Joint Fire Sciences Program, Ford Foundation, National Research Initiative, and other sources will be pursued to help support research specific to the four threats and strategic plan objectives. In addition, efforts such as the visitor management and recreation behavior simulation workshop (sponsored by the team in 2004) and the 2005 national recreation research and management workshop are aimed at providing recreation research to managers in a timely manner. These workshops responded to the need to provide research to assist managers in providing quality recreation opportunities. Results of workshop discussions are being used to develop a national recreation research agenda. Additional workshops and presentations that engage scientists and managers are planned.

Potential partners and collaborators include, but are not limited to, scientists at PNW and other research stations, University of Idaho, Colorado State University, Penn State, Utah State University, Alaska Pacific University, University of Alaska-Southeast, University of Alaska-Fairbanks, University of Alaska-Anchorage, University of Montana, University of British Columbia, University of Northern British Columbia, Canadian Forest Service-Northern Forestry Centre, Alaska Region (Forest Service), Tongass and Chugach National Forests, National Park Service, U.S. Fish and Wildlife Service, Bureau of Land Management, Environment and Natural Resource Institute, The Heritage Foundation, Audubon Society, State of Alaska, Native Organizations, Alaska Recreation and Park Association-Wildlands Section, Alaska Wilderness Recreation and Tourism Association, local communities, and others.

Understanding relations between communities and forests requires attention to multiple temporal and spatial scales and use of multiple methods to understand complexities of interactions across scales. Methods will include, but are not limited to, synthesis, analysis of secondary data and collection and analysis of primary data gathered through interviews, focus groups, participant observation, survey questionnaires, participant mapping, visual anthropology, photo elicitation, and textual analysis. Participatory action research will be used as appropriate to provide opportunities to engage community members in the research process and can build capacity while increasing the accuracy of data and acceptability of findings and recommendations following from the research (Kruger and Sturtevant 2003). Studies will be initiated, as funding becomes available. Initial studies are identified here.

## Near-Term Studies (the Next 5 Years)

In the next 5 years, studies will focus on describing and documenting shifts in the use of natural resources and the valuation of goods and services. The ways people use and value the forest and the role forests play in daily life are changing. This work will explore how to account for ecosystem services (including goods) derived from national forests, represent them effectively in planning and management decisions, and monitor them over time.

Research is underway to provide guidelines for managing recreation resources in a regional context rather than on a site-by-site basis. Through a study initiated in 2004, scientists from Utah State University are examining visitor management, focusing on bear-viewing facilities and opportunities. We are pursuing a partnership with the U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, and Alaska State Parks to expand the study to include

fieldwork. The work may be expanded to include design of a large-scale recreation analysis that sets the stage for long-term studies of recreation and tourism use within changing social, economic, and environmental conditions.

Partnering with scientists at Penn State University, we are examining possible relationships between attachment to place/sense of place and volunteerism by using photo elicitation techniques. We are asking members of the community to take photos of places that are meaningful to them and then explain what about the place is important. Through this study we will gain a greater understanding of characteristics of places and relations with places that are important to people and of volunteerism and whether the two are related.

Research is planned that will examine trends in shore excursions and guide and outfitter use of the national forest. This study will explore how demand for experiences is changing, what managers need to know in order to anticipate and be responsive to needs accompanying changing demand and how communities can position themselves to benefit from increasing tourism while preserving community culture and the places and opportunities they value. Benefits of guide and outfitter services to communities will also be examined.

In conjunction with the Canadian Forest Service, team members will examine the implications of global climate change (social, economic, ecological) for communities in Alaska. The team will identify information to help communities and resource managers increase adaptive capacity and resilience.

Tourists are not the only people recreating in Alaska. Understanding travel patterns of Alaskan residents recreating in Alaska and the nature-based activities they participate in will assist recreation managers in planning facility maintenance and development. Knowing today's travel patterns sets the stage for future studies that will enable understanding of trends in resident recreation. An interagency study of resident recreation is underway that will improve our understanding of resident travel.

**Knowing today's travel patterns sets the stage for future studies of resident recreation.**

Wildfire is of concern to communities on the Kenai Peninsula and in interior Alaska. We are interested in understanding the effectiveness of community wildfire planning and implementation efforts. We have proposed a study to explore whether institutional arrangements impede or enhance community efforts. The study is dependent on outside funding from the Joint Fire Sciences Program or another program. Related studies could also address invasive species and community stewardship projects.

We will initiate a study of community transition, especially examining demographic and economic change, including amenity migration and gentrification. This will be part of a larger community assessment project looking at current

conditions, trends, agents and determinants of change, potential for recreation and tourism and other economic development, and the role of local leadership. This study will also entail identification and use of social linkage indicators and development of tools and protocols for organizing and analyzing data and applying knowledge in planning and management decisions.

## Science Coordination and Delivery

Research will be coordinated with other efforts such as ongoing work through the Institute for Social and Economic Research, Alaska Wood Utilization Research and Development Center, University of Alaska system, other universities, Canadian Forest Service Research, nongovernmental groups, and others.

Research will balance knowledge creation with tools and applications to improve understanding that informs policy development and on-the-ground management. Science delivery will take many forms. Scholarly publications, particularly peer-reviewed journal articles will be completed for each study. In addition, publications for managers and the public will be developed and published. As appropriate, knowledge will be shared through workshops, fieldtrips, slide shows, and presentations; community and regional forums; and through the development of tools, protocols, and consultations.

## Conclusions

Social science research can address many questions important to managers, particularly those that ask about the nature and distribution of goods and services, meanings, values, and uses associated with natural resources, and perceptions and attitudes of residents and visitors. Answers to these questions can help managers as they design and evaluate alternative management strategies and consider their implications for communities. Effective resource management depends on public understanding, support, and participation. Studies undertaken by this team aim to better understand what knowledge people have about forests and resource management, how they think about forests and forest management, what goods and services they expect forests to provide, and how to better engage people in management decisions and activities for equitable and efficient outcomes within the bounds of biophysical possibility.

There is much we can learn. What places do communities value on the forest? How, where, and when do communities use forest resources? How are values and uses of the forest changing? How does community use and marketing of the forest affect the resource and its management? How do changes in

forest management or forest uses affect local communities? How can we engage communities in management activities of mutual interest? How is tourism changing? How is tourism affecting communities? What role does the Forest Service play in working with communities on tourism-related issues? What can tribal residents tell us about historical relations to the land that might provide clues to sustainable use? The research agenda proposed here can contribute important information to forest planning and management to help managers sustain resilient communities and forests in Alaska and beyond.

## Acknowledgments

We want to thank all those who reviewed various versions of the problem analysis and those who attended presentations while it was a work in progress for their thoughtful and constructive suggestions. Reviewers and those who offered comments and helpful suggestions include Bob Schroeder, Stewart Allen, Guy Robertson, Brian Glaspell, Lee Cerveny, Richard Haynes, Courtney Flint, State and Private Forestry staff, Dale Blahna, Beth Pendleton, Sandy Boyce, Anne Hoover, Jim LaBau, Trista Patterson, and Roger Clark. Special thanks to Kelly Lawrence for her graphics and other support and Erin Burkhart and Maria Stiefel for final proofing.

## English Equivalents

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## Appendix: Research Questions

We compiled the questions and tasks identified from existing documents on research needs and from discussions and meetings with managers and scientists from federal and state agencies and stakeholders from communities and non-governmental organizations. They are organized within the four focus topics of this research agenda, and although not an exhaustive list, they do provide an assemblage of questions that have been voiced over the years and echoed by a variety of sources. Current and proposed research projects and collaborators are listed in table 1.

**Table 1—Current and proposed research**

| | | Themes | | | |
|---|---|---|---|---|---|
| **Research areas** | **Collaborator** | **Communities in transition** | **Stewardship and collaboration** | **Tourism and recreation** | **Cultural orientation** |
| Current research | | | | | |
| Resident recreation | University of Alaska, Fairbanks and others | | | X | |
| Sense of place/volunteers | Penn State University | X | X | X | X |
| Bear viewing/recreation planning | Utah State University | X | X | X | X |
| Wildfire and community risk | University of Illinois | | X | | X |
| Proposed research | | | | | |
| Amenity migration | ACaFE Team[a] | X | X | X | |
| Outfitters and guides | ACaFE Team | X | X | X | |
| Global change and communities | Canadian Forest Service Research | X | | X | X |
| Community assessment/indicators | Utah State University | X | X | X | X |
| Ecosystem services | ACaFE Team | X | X | X | X |

[a] ACaFE = Alaska Communities and Forest Environments.

### Communities in Transition

Improve understanding of the structure and nature of community capacity, vitality, and resilience, and the role of alternative factors, such as infrastructure, leadership, and community attitudes in building capacity. Improve understanding of community capacity, vitality, resilience, and well-being and how recreation, tourism, attachment to place, access to subsistence resources, and the various forms of community capital influence and are influenced by these aspects of community. Improve understanding of community and natural resource interactions at multiple scales. Improve understanding of strategies for building capacity and increasing well-being in communities in transition.

Develop key concepts associated with place attachment and sense of place and design processes and protocols to use in assessments, planning, and management at regional, watershed, and site-specific scales.

Evaluate and adapt processes for community assessment and models of community capacity, resilience and community response to change. What concepts and frameworks could facilitate self-assessment, civic science, and other opportunities for community involvement? What do communities need in order to conduct their own self-assessments?

Identify the social values held by rural communities and their ties to resources (goods and services) and resource management and patterns, processes, causes, and effects of socioeconomic change across communities and regions in Alaska. How do people in different communities perceive the changes in the natural resource base? How is the forest defined and valued in terms of protection and use, amenities, and goods and services (Tarrant et al. 2003)? What are the differences between those who focus on supply (there is an unlimited supply of trees to harvest), and those who understand the role of market demand (many Alaska wood products are not competitive on the world market)?

What infrastructure features—social, economic, and physical—are desirable or necessary for communities to adapt to changing natural systems and management strategies? What role should the Forest Service play in helping communities maintain local economic opportunities or transition to new economic conditions?

How are communities in Alaska changing, and how might they be affected by changes in access (roads, high-speed ferries), tourism, forest management decisions, and global change? How can the Forest Service work with communities to engage in joint problemsolving?

Extend research on typologies of communities (both geographic and interest), the factors underlying community change, and the links between community change and forest management.

Improve understanding of the determinants of population change and how these changes influence, are influenced by, and interact with management and use of forest land, public participation, social acceptability, collaboration, and community well-being and resilience.

Sense of place plays an important role in sustaining many small Alaska communities. Many people live simply, on the edge of what is considered poverty. Many people look for odd jobs and seasonal work in order to maintain a lifestyle in a certain location. How is attachment to place related to community resilience or well-being? Is it more prevalent in small, rural communities or high-amenity

places like gateway communities in Alaska and Montana? What role, if any, does it play in participation in stewardship and forest planning activities?

Recent studies have identified that many Alaska youth leave the state for higher education and do not return. This is coupled with many non-Alaskans who come to the state for technical and professional jobs. What programs might connect Alaskan youth with opportunities for future employment in natural resource-related jobs in Alaska (while expanding their understanding of natural resources and resource issues)? What mechanisms might be used to encourage Alaska youth to pursue a higher education/training and return home with degrees and experience that qualify them for available jobs with resource agencies?

## Collaborative Planning and Stewardship

Develop understanding of concepts of place, sense of place, and place attachment as they apply to human-forest relations, the application of place-based planning, and the role of attachment to place in recreation patterns, expectations of land management, and participation in planning and management activities such as stewardship projects. Develop and assess place-based, collaborative planning tools and processes for agency and community use in assisting people in identifying and understanding their values and opportunities and to assist them in making informed decisions on which shared values to maintain. Map social values to spatially show how people value the resource and where. Determine what social information is needed and at what scale for development of environmental impact statements, forest plans, and other planning and decisionmaking processes.

Apply and assess the application of theories, models, and practices of collaborative planning, community forestry, stewardship, and comanagement. Where are there opportunities to implement stewardship, comanagement, or community forestry as an adaptive management strategy? How are Alaska's forests used and valued? How can we improve understanding of human-forest relations, especially valued goods and services of forests and expectations of management?

What opportunities are there to work with communities on Prince of Wales Island and elsewhere to examine alternative management approaches? Where are opportunities for watershed restoration, fuels and invasive plant reduction, and microsales (small-scale sales oriented at small local operators and markets)? Is there a relationship between comanagement and stewardship and community capacity? What can we learn about stewardship from traditional relations to the land historically practiced by Alaska's Native people?

## Tourism and Outdoor Recreation

Identify cultural, heritage, and ecotourism considerations and opportunities for rural communities, including social, cultural, and economic impacts and opportunities and nonhuman ecosystem considerations. Develop tools to assist communities in identifying desirable, feasible, sustainable tourism. What are the opportunities and implications of tourism for small communities?

Identify the relationship of place, sense of place, and place attachment to recreation choice and behavior and resource management, subsistence, and community resilience, and design ways to use this information in resource management decisionmaking (overlaps with problems 1 and 3). How can the Forest Service respect community values while providing for tourist and recreationist demands?

Examine the impacts of recreation and tourism activity on local communities, their identity and sense of place, their economic development, and resource quality. How are communities changing as tourism expands and diversifies? (Hoonah, Hyder, Sitka, Ketchikan, Juneau). How has tourism, especially charter fishing, affected resident recreation and subsistence? Do commercial permits result in displacing other users and impacts to other locations?

Explore how conceptions of recreation vary among stakeholders, and the implications of these similarities and differences for research, planning, and management processes. How do Alaskans (rural, urban, Native, non-Native, long-time resident, newcomer) define recreation? How do they refer to leisure/nonwork activities in the outdoors? What differentiates recreation, subsistence, and other nonwork outdoor activities?

There are many emerging questions as to the appropriate and inappropriate application of recreation carrying capacity and related visitor management tools. What guides the application of different approaches to concentration and dispersal of visitors in a regional, ecosystem management context? What tools and information do managers need to define appropriate, compatible, and sustainable activities and use levels? What tools and information do managers need to help them balance commercial and noncommercial use and allocation?

What information is needed to assess what levels of tourism and recreation use are sustainable?

How is recreation in Alaska changing? Assess the desires, opinions, and beliefs of Alaska residents regarding forest management and recreation opportunities and their participation in outdoor recreation (multiagency effort).

Assess the implications of change on recreation and tourism in Alaska including settlement patterns, second home development, improved transportation (fast ferries, new roads, etc.), new and bigger cruise ships, terrorist attacks

and the Iraq war, aging and diversifying population, global climate change, etc. What strategies are available to assist communities in preparing for and adjusting to change?

What policies would support local businesses and entrepreneurs in reaping economic benefits from use and development of Alaska's resources? What are the opportunities for niche tourism? What is the contribution of guides and outfitters to local communities?

Bear-viewing opportunities are increasingly in demand. What is the range of desired and desirable experiences for bear viewing? What are considerations and opportunities for site development?

What tools, methods, and messages can reduce the risk of recreationists introducing and spreading invasive species? What programs can be designed to promote public participation in eradication of invasive species?

## Cultural Orientations to, Uses, Values, and Knowledge of Natural Resources

What are the interactions and interrelations between and among recreation, tourism, and subsistence uses? How have changes in land tenure and management affected attitudes toward and use of natural resources? There are also opportunities to identify the interactions among subsistence (as an activity and the products obtained), sense of place, and community vitality and resilience. What is the basis for describing experience value for subsistence users? What indicators should be measured and monitored to assess change in experience over time? What are components of a quality subsistence experience?

Document cultural practices that have been sustained through the relationships people maintain with forest resources and the environment. Design management and community development strategies that help sustain cultural traditions and diversity.

Develop improved frameworks, concepts, and approaches to identify, measure, evaluate, and monitor the ways in which people relate to forests—through their use, knowledge, concerns, preferences, and values. Develop a characterization of forest resources and their uses. Explore the implications of global change on traditional resource activities and Native communities.

Prepare and publish problem analysis and synthesis of knowledge about historical, contemporary, and emerging forest users and uses, including the social/cultural aspects of special forest products and potential markets.

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