

Natural Areas Report

Vol. 9, No. 2

Summer 1997

Natural Areas News and Information Exchange

Learning From Alaska

Alaska is a large and difficult idea to grasp all at once. It is easily overwhelming in scale and diversity. To many, it is a remnant frontier, the last place with plenty of natural areas, plenty of resources, and plenty of space to have it all. Stories of remoteness, riches, and robber barons make it too easy to think of the great north land in 19th century terms. But it is important to try to understand Alaska in light of the 21st century. What image is more accurate, more forward-looking than that of the Last Frontier?

According to retired historian, William E. Brown, Alaska is a metaphor for our larger national interests and concerns. All the issues that relate to Alaska relate as well to the nation as a whole and to the yet larger world that we all share. How do the problems and politics of protected lands in Alaska reflect those in other parts of the country? What can we, in the lower 48, learn about planning and management of natural areas in our own regions from the work going on in Alaska? In this issue of the *Natural Areas Report*, scientists and managers from across Alaska provide perspective on the land in which they live and work.



artist: Margaret Herring

The Challenges for Environmental Information in Alaska

In contrast to the rest of the United States, Alaska is still unsettled. In an area one-third the size of the continental U.S., less than one percent of land is occupied by human activity. Alaska does not have a large number of species or ecosystems; much of the land is glacial ice or high barren mountains free of snow for only a brief period each summer. But it would be a mistake to assume the state's biodiversity is low. In fact, Alaska is rich in a variety of biological processes and in functioning populations of species which are effectively gone from the continental U.S. For example, it is still possible to study recent deglaciation, a process that molded much of the eastern and central U.S. It is still possible to study ungulate migrations, a feature that once defined the Great Plains. It is still possible to

study the population dynamics and trophic relations of wolves and bears. It is still possible to learn about nunataks, glacial refugia, and species micro evolution following deglaciation. The indigenous people of Alaska still maintain some of the last subsistence life styles in the world.

Many things are still open to study in Alaska, especially about development and sustainability, providing lessons that could be useful for developing nations around the world. Alaska offers an American proving ground to test what we have learned in the lower 48 states. If we ourselves cannot find a way to develop sustainably, protecting biodiversity while developing a stable economy, can we reasonably ask the Indonesians or Colombians to do so?

...continued on page 2

...continued from page 1

This question is central to the work of the Alaska Natural Heritage Program (AKNHP). The Heritage Program is small; its staff of ten represents one person for every 59,100 square miles within the state. While part of the Nature Conservancy's Natural Heritage network, AKNHP is located at the University of Alaska Anchorage, a state university. AKNHP's mission is to provide objective information about the distribution and abundance of rare and ecologically significant species, ecosystems, and sites in Alaska in order to encourage an ecologically sound human economy.

Our small size and multi-institutional base can cause problems, but they are usually an advantage. We are able to bridge jurisdictions and form cooperative projects that would be more difficult for larger, institutional based organizations, and to sidestep occasional state/federal conflicts.

The two biggest problems faced by the Heritage Program are Alaska's tradition of a boom-and-bust economy and our lack of baseline knowledge about the land's natural elements and their interactions. Gathering scientific information in Alaska is difficult and expensive, due to the vastness of the region and the short available field season. Scientific understanding of the land is not often a priority until an economic activity focuses attention on a particular place or specific resource. Whether it be an oil pipeline across the tundra or an oil spill in Prince William Sound, money follows development. When problems arise, there is little or no baseline from which to measure effects.

Gathering long-term, baseline environmental data is rarely budgetted by state planners. As a result, much of our knowledge of the land dates back to early explorers, such as the Harriman expedition of 1899 in which John Burroughs and John Muir were participants.

As with other natural heritage programs and systematics collections elsewhere, curating the few existing long-term datasets is precarious. For many taxa, there is no expert available within the state. For others, there is no expert at all. And many significant taxa remain undescribed. For example, fresh-water invertebrates would appear important to a state such as Alaska with major anadromous fisheries, but up to 90% of some groups have yet to be described.

Collecting and curating long-term data is a major challenge

to AKNHP. Equally great is the challenge to provide a groundwork of scientific understanding to a sometimes polarized process of decision-making. AKNHP works with land management agencies to provide decisionmakers with impartial environmental information. Getting that information used appropriately in public decision-making processes is a bigger challenge yet, as many land management agencies are learning.

Ideally, in conflicts between conservation and development in Alaska, both sides would seek a solution that is both ecologically and economically stable and sustainable. Consensus and compromise would replace a system of winner-takes-all. This would require information; each side needs to know enough to be sure the solution represents a middle ground.

Unfortunately, scientifically credible information is very slow and expensive to generate, especially in Alaska. To complicate

matters further, the resources to gather such information are declining in many cases. Without enough information, debates over conservation and development lack credibility on either side, and choices develop more from passion than fact. With a growing Alaskan human population, declining oil resources to pay Alaska's expenses, and the occasional wild-card international energy crisis precipitating matters, there needs to be a more viable process for making decisions with long-term effects on the land.

There will have to be compromises in order to find solutions that are stable and realistic both economically and ecologically. A broad base of

environmental information will be necessary to identify such choices and to make wise compromises. The Alaska Natural Heritage Program, as well as state non-game and natural areas programs in the Forest Service, BLM, and the National Park Service in Alaska, can provide the basis for understanding critical processes and elements within the landscape, understanding that is essential to changing the pattern of decision-making in Alaska.

David Cameron Duffy
Alaska Natural Heritage Program and
Department of Biology
University of Alaska Anchorage
707 A Street, Anchorage AK 99501
Email: afdcd1@uaa.alaska.edu



artist: Margaret Herring

Wolves in Alaska

Alaska is home to a significant portion of North America's total wolf population and has by far the largest wolf population of any U.S. state. In recent years about 6,000 to 8,000 wolves have occupied the state from the extreme southeastern coastal rain forests to the arctic tundra. Yet these numbers have fluctuated greatly through historical times. As in virtually every other place in North America, Alaska's wolves were exploited heavily early in this century as miners and trappers settled the country, living off the land. Wolves were shot, trapped, and poisoned in great numbers and by the early 1920s had declined to such low numbers that Olaus Murie (the famous naturalist) found very little wolf sign on a long winter trip through the interior. Wolves were even extirpated from some areas, including the Kenai Peninsula. That they persisted in most places here is testimony to the remoteness of the country, the presence of some sparsely settled areas that acted as refugia, and the resilience of wolf populations to withstand and recover from persecution.

Following this early period of wolf reduction, there followed a period of wolf population recovery, especially during World War II when fur prices were low and trapping pressure was light. After the war, however, another assault was conducted on wolves as government-sponsored wolf reduction programs occurred across the state. Aerial shooting, a very efficient practice for taking wolves in many areas, began on a large scale. Bounties served as an incentive for hunters and trappers to take wolves. Government trappers used poison extensively, at times dropping poisoned baits over vast areas with airplanes. The net result of all this was another sharp decline in wolf numbers by the mid-1950s. In a 20,000 square mile area called the Nelchina Basin (near Glennallen), aerial shooting and poison reduced wolves to one pack that could have been eliminated too but was deliberately spared.

After statehood, wolf populations again increased and have fluctuated in recent years in response to changes in prey populations, wolf control programs, and hunting regulations. During the past 25 years, wolves across North America, including Alaska, have been the focus of much research on a wide variety of

subjects including natural history, ecology, and prey relationships. Their endangered and threatened status in most of the U.S. has put them in the public eye, and wolves have been in the center of conservation and restoration efforts in places including the northern Rocky Mountains and the southeastern U.S. where red wolves were reintroduced. In Alaska, however, public attention has often been focused on controversial wolf control programs designed to increase moose and caribou populations to benefit hunters.

Research has shown that habitat requirements of wolves are quite simple--wolves require adequate populations of large mammals to serve as prey, areas suitable for den sites, and large,

remote tracts of land where wolves receive some measure of protection from humans. Numerous studies have shown that hunting and trapping, facilitated by access into wolf habitat, are often major limiting factors of wolf populations. On the Copper River Delta in the Chugach National Forest where my graduate students and I have done wolf research since 1990, this pattern is evident. On the west delta where road access exposes wolves to much hunting and trapping, wolves have been reduced to low densities. Even on the east delta lacking road access, people using airplanes, boats, and snow machines are the most important mortality factor for wolves. We anticipate that when roads on the east delta are



artist: Margaret Herring

developed in the near future to extract timber and coal resources, wolf mortality rates will increase and numbers will decline.

On the Tongass National Forest, recent efforts to revise the Forest Plan have highlighted the relationships between access, roads, effects on deer (the major prey animal for wolves in that area), wolf mortality, and wolf numbers. On Prince of Wales Island where road building and timber harvesting have mushroomed in recent years, access for trappers increased greatly as did wolf mortality. A conservation assessment of wolves in southeastern Alaska recommended that a system of reserves be established on Prince of Wales Island adequate in extent and size to protect the territories of nine separate wolf packs from road building and timber harvesting so that a viable population of

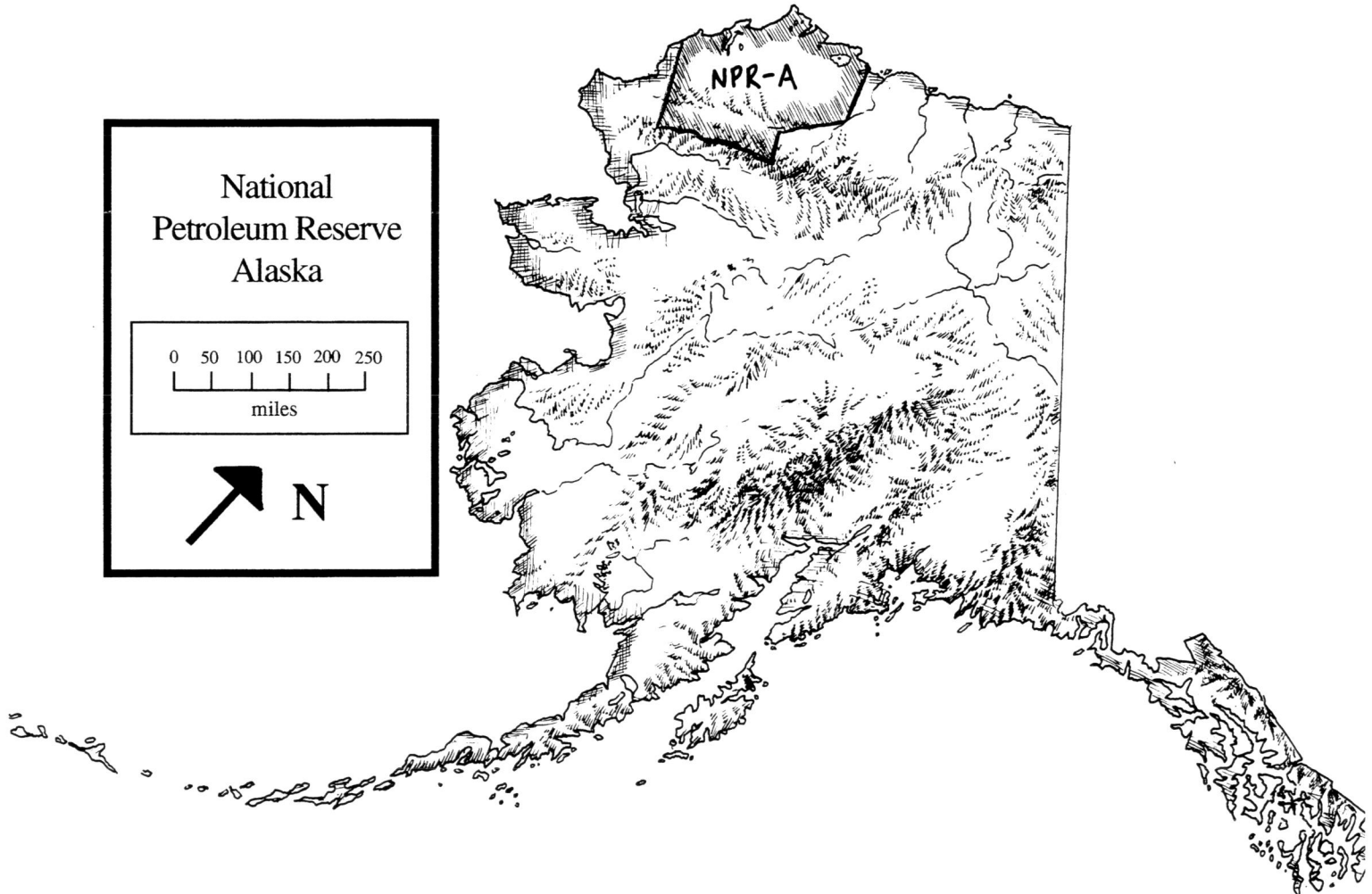
...continued from page 3

wolves would persist on the island. Such reserves are increasingly being recognized as important to long-term conservation strategies for rare and sensitive species, and may be regarded as crucial for species like the wolf that are subject to high rates of human-caused mortality.

It is tempting to think that wolves in Alaska are totally secure due to the sheer size of the country and the remoteness of many areas. Most wolf biologists agree that as a species, wolves in Alaska face no immediate threats. History has shown, however, that Alaska is not immune to the same patterns that extirpated wolves elsewhere, and there are places here where

management efforts must be conservative in order to retain wolves. Fortunately, we have a good understanding of wolf ecology on which to base management actions. The difficulty lies in applying such actions in a political arena that is often highly charged and occasionally reluctant to consider long-term conservation concerns.

*V. Van Ballenberghe
PNW Research Station
Anchorage Forest Sciences Laboratory
3301 C Street
Anchorage, AK 99503-3954*



The National Petroleum Reserve of Alaska

At 23 million acres, the National Petroleum Reserve of Alaska (NPR-A) is the biggest single tract of federal land in the United States. The Reserve was originally set aside in 1923 as a future source of oil for the Navy. In 1976, the NPR-A, along with various oil reserves in other parts of the nation, was transferred to the Department of the Interior. Last year's defense authorization act allowed the sale of the oil reserves, a move supported by both the state governor and the President.

With the opening of the Reserve to oil exploration, comes a now-familiar debate between conservation and development. While the opening remarks in the debate have primarily plowed old ground in terms of how Alaska's natural resource conflicts are resolved, NPR-A offers an opportunity to find new ways to make decisions about development in Alaska.

With declining production at existing oil fields, Alaska faces a decision: either cut state spending and subsidies to residents or develop a new source of oil. New oil fields have been discovered just to the east of NPR-A on state lands. Suitable oil-bearing geological strata extend westwards into NPR-A.

Previously, when interest in oil exploration had turned attention to the Arctic National Wildlife Refuge, conservation groups argued the unique richness of the refuge's coastal plain. The move to open NPR-A seems to compromise their argument, because the NPR-A may be even richer biologically than the refuge. However, the name National Petroleum Reserve reflects the original intent for the land, and does not lend itself to conservation lobbying. As one senior federal official said: "It is hard to get worked up to protect something that already has 'petroleum' in its name".

Yet biologically, NPR-A is impressive. The main calving grounds of the western Alaskan caribou herd, the largest in Alaska, lie entirely within NPR-A's borders. A good proportion of the world's brant gather to molt and fatten up for migration around Teshekpuk Lake, and millions of shorebirds and ducks start life in NPR-A's tens of thousands of coastal ponds and wetlands. Two waterfowl species, Steller's and spectacled eiders, listed under the Endangered Species Act, nest primarily in NPR-A. Along the Colville River, there are major nesting concentrations of peregrine falcons and gyrfalcons. And several Inupiaq communities rely on lands within NPR-A for their traditional lifestyle of hunting and gathering. The presence of these native communities on this land goes back at least 8,000 years, leaving a legacy of over a thousand archeological sites.

The initial bid to open NPR-A suggests leasing within a 4.6

million-acre section (20% of the total) at its eastern end. The Bureau of Land Management (BLM) has begun an Environmental Impact Statement (EIS) process limited to the potential leasing area. The entire process is to take 18 months; six months for the first draft, which is due in August 1997. Because of the condensed timeframe, previous EISs, prepared for earlier oil leasing in the area, will likely provide the basis for much of the new EIS.

As suggested in past EIS efforts, the Teshekpuk Lake area may receive special attention, particularly the area east of the lake where caribou calving and leasing overlap. Presumably, future EISs will consider the possibility of leases all along the shore of NPR-A, where oil-bearing sands underlie the coast and its rich waterfowl habitat.

With groups already polarized over questions of conservation and development, one might expect future litigation. But there may be better ways to identify alternatives within the NPR-A. For example, present leasing might go forward in exchange for the designation of one or more protected areas within the initial lease area and the undertaking of a comprehensive EIS for the entire NPR-A. All sides would work together to identify critical sites and to steer development to less sensitive areas. An open process of compromise and consensus, based on a critical understanding of long-term economic needs and ecosystem processes, could result in a new model for decision-making in the state.

Consensus and compromise requires shared information, and gathering information requires time. With the short field seasons of the high Arctic and its severe logistic constraints, it can take several years to complete inventories or basic ecological studies. It is not clear that we have given ourselves the time to collect information and develop understanding that will lead to consensus among the oil industry, conservationists, and native subsistence users. Yet a process of consensus could move Alaska closer toward resolving the need to develop its nonrenewable resources and its equally strong need to protect its environment and the renewable resources on which its rural and native citizens depend for survival.

*David Cameron Duffy
Alaska Natural Heritage Program and
Department of Biology
University of Alaska Anchorage
707 A Street, Anchorage AK 99501
Email: afdc1@uaa.alaska.edu*

A New Era of Land Management in the Tongass National Forest

On May 23, 1997, Regional Forester Phil Janik signed the Record of Decision approving a revised Forest Plan for the Tongass National Forest, ending a contentious ten-year planning process for the nation's largest National Forest. The controversies will continue, but everyone involved breathed a collective sigh of relief.

Alaska's southeast panhandle consists of over 1,000 islands of the Alexander Archipelago plus a narrow strip of mainland sandwiched between the coast range and the ocean. It is a major component of the world's largest remaining temperate rain forest, as well as home to about 72,000 people, many of whom make their living and sustain their culture and lifestyle directly or indirectly from the region's abundant natural resources. The Tongass dominates the region's land base, comprising about 17 of the 21 million acres of southeast Alaska.

The revised plan reflects the agency's evolving ecosystem-based approach to management, with a few unique Alaska twists. The plan sets aside nearly 14 million acres in natural setting land use designations. Wildlife habitat is addressed two ways: through a reserve system; and through standards and guidelines that apply to lands allocated for some level of development. These were designed together to provide connectivity functions. The reserve system has three components which, taken together, incorporate 70 percent of the existing productive old growth on the Tongass:

- wilderness, legislated non-development areas, and other lands allocated for protection of old-growth ecosystems;
- mapped habitat conservation areas, including 38 large (40,000-acre minimum), 112 medium (10,000-acre minimum) and 237 small (average 1,600 acres) areas;

...continued on page 7

Assessing Research Natural Area Representativeness in the Chugach National Forest

The existing management plan, from 1984, of the Chugach National Forest proposes establishment of nine research natural areas (one of which, Green Island, was established on July 25, 1997). The proposed areas range from glaciers and spectacular alpine summits to biologically rich coastal wetlands and luxuriant rainforests. While the nine candidates include important features of diversity, five of the nine represent glacial features and only one focuses on wetlands. High biomass forests, aquatic features, and alpine tundra appear inadequately represented.

Since 1994, the Chugach National Forest has conducted studies that explore how well proposed RNAs on the Forest encompass the bioenvironmental variability present. These studies have been based on the premise that RNAs are established to maintain a representative set of natural biological diversity for use as baseline areas. The methods developed and tested in these projects will be valuable for identifying a representative RNA network for inclusion in the revised Forest Plan.

In a study conducted collaboratively with Pacific GIS, weather data from discrete stations were extrapolated across the landscape. A classification of biologically relevant climatic conditions (i.e., bioclimates) was used to assess the degree to which RNAs encompass the full range of bioclimatic variability present on the Forest. Significant gaps in representation were found. The proposed RNA network and recommended wilderness adequately represent only 26 and 34 percent of the bioclimatic classes, respectively. An additional 11,500 hectare

would have to be added to existing or as new RNAs to ensure representation of all bioclimatic classes in units of 500 hectare or greater.

In another study, conducted collaboratively with the Alaska Natural Heritage Program, a variation of the "Conservation Options and Decisions Analysis" (CODA) procedure was used. CODA was developed by Michael Bedward and associates in Australia and provides by an iterative algorithm for selection of representative reserves. Within the Copper River Delta study area, landcover type and landscape type were used as the representativeness criteria in the selection of 5 and 20 percent of the total area of the Copper River Delta in reserves. Contiguous watersheds were used to generate reserves with low perimeter to area ratios and high connectivity.

The CODA approach is presently undergoing testing as a tool for identifying representative RNAs Forest-wide. Adequacies, deficiencies, and redundancies among the nine areas currently proposed for designation would be clearly identified. Modifications to boundaries of candidate RNAs, possible elimination of redundant RNAs, and identification of new candidate RNAs to fill in representativeness gaps would all be products of this analysis.

*Robert L. DeVelice
Vegetation Ecologist
Chugach National Forest
3301 C Street
Anchorage, AK 99503-3954*

...continued from page 6

- and, protection of islands smaller than 1,000 acres.

In addition, standards and guidelines that apply to portions of the Tongass where commercial timber harvest is allowed (about 22 percent of the Forest) will maintain nearly 70 percent of current productive old growth within those areas. These include 1,000 foot-wide buffers on all beaches and estuaries, with no scheduled timber harvest, and variable-width buffers along streams.

The revision adds six Research Natural Areas totaling about 34,000 acres. It recommends terminating the RNA designation for Pack Creek, where increases in human use at this renowned brown bear viewing site have made the area less compatible with RNA objectives. A replacement site is proposed.

From an initial inventory of 300 rivers identified for study, 32 rivers (541 miles) are recommended for designation under the Wild and Scenic Rivers Act, out of 112 (1,394 miles) deemed eligible. Of the remaining eligible river miles not recommended, 411 miles are in Wilderness or Congressionally-designated non-development lands, 224 miles are in other non-development allocations. Included in the list of suitable rivers is the LeConte glacier, referred to as a "river of ice" in the Record of Decision. The Plan also allocates nearly 4 million acres to various types of development, including about one million acres open to moderate development and just under three million acres open to more intensive development such as timber production, mineral projects, and transportation and utility systems. Timber harvest is scheduled on about 670,000 acres over the next 100 years, with an annual sale quantity (ASQ) of 267 million board feet – the maximum amount of timber that can be harvested annually. Of this, about 200 million board feet is expected to be offered for sale annually over the next few years. The 267 million figure is close to half of the previous ASQ, but is more than the amount harvested in recent years.

One of the central considerations of the plan is how it will affect residents in the 30 or more communities of southeast Alaska. People who live in southeast Alaska – and many who live elsewhere – care deeply not only about biophysical components of ecosystems, but also about the social and economic health of southeast Alaska communities. Over the ten-year planning period, the pace of social and economic change in southeast Alaska has been great. There are many stories to tell, but we will focus on anticipated effects of the plan on the region's main natural resource-related industries (wood products, recreation/tourism, and fishing and seafood processing), and on subsistence opportunities.

As has been the case in the Pacific Northwest, the timber industry has declined dramatically, closing mills and lowering employment more than 40 percent since 1990. The long-term federal timber contracts that guaranteed a supply of wood to the region's largest mills have ended, signaling to some the end of the era of industrial forestry. Harvests have also been declining

on lands owned by Alaska native corporations, which historically have contributed over half of the volume harvested in southeast Alaska. According to Forest Service economists, the lower ASQ of the revised plan is more than adequate to meet demand for timber. Yet all acknowledge that the closing of the pulp mills may greatly change the configuration of the wood products industry in southeast Alaska. The ending of the long-term contracts provides an opening for smaller operators, such as a company's recent purchase of the sawmill in Wrangell (which had closed in 1994), and a new mill scheduled to open near Ketchikan (with an estimated 60 employees, compared to some 500 associated with the pulp mill).

The tourism industry has flourished during the same period. The inside passage, Alaska's most popular tourist destination, has seen a rapid increase in the number and size of cruise ships making the voyage. An increasing number of ecotourists are also traveling off the beaten path. The revised Plan attempts to support recreation and tourism through management of federal lands for scenery, wildlife, and a variety of activities and experiences.

The fishing industry has always been a mainstay in the state, and fish harvesting and seafood processing together represent the largest natural resource-dependent industry in southeast Alaska. Recent changes in fishing management have affected many components of the industry, although employment levels remain stable and some fish catches are at all-time record highs. The revised Plan is expected to increase protection for streams used by anadromous fish. However, factors other than Forest Service management have provided the bulk of the variability in fish populations; these include ocean cycles, fish

...continued on page 8



Phil Janik, Regional Forester for the Alaska Region of the USDA Forest Service, signs the designation orders establishing seven new Research Natural Areas, six on the Tongass National Forest and one on the Chugach National Forest; as Greg Nowacki (left), Regional Ecologist, and Randy Coleman (right), Regional Management Analyst, look on.

...continued from page 7

market characteristics, and climate. As a result, the revised Plan is not expected to significantly affect the fishing industry.

An overview of southeast Alaska's economy is incomplete without considering subsistence: the harvesting of wildlife, fish, and plants for personal rather than commercial use. Subsistence is a major component of the lifestyle and culture of many southeast Alaskans, as well as a significant contributor to economic well-being. Over half of the households in rural southeast Alaska obtain more than one-third of their meat from subsistence harvest. Subsistence is protected by both state and federal policy, which establish subsistence as a priority over other uses in times of scarcity. If the maximum permissible timber harvest occurs, the revised Plan Final EIS forecasts an impact to subsistence harvest of deer in upcoming decades in some areas of the Forest, but anticipates no restrictions on other resources.

Effects of the revised Forest Plan will depend on how projects are scheduled and carried out, because the new Plan is more of a zoning-type device that specifies what activities are allowed on what lands, rather than a site-specific plan that prescribes exactly what will occur where, and when. Monitoring of social effects, as well as biophysical impacts, will allow the Plan to be evaluated on a regular basis. Finally, the Region is just beginning an ambitious program to increase the amount of collaboration that takes place with the public during development of projects carried out under the Forest Plan. This is expected to provide opportunities for the public to influence implementation of the new Forest Plan.



Natural Areas Report

U.S. Department of Agriculture
Pacific Northwest Research Station
333 SW First Street
PO Box 3890
Portland, Oregon 97208

Stewart Allen
Research Social Scientist
PNW Research Station
2770 Sherwood, Suite 2A
Juneau, Alaska 99801-8545

Natural Areas Report

Editors: Margaret Herring
Sarah Greene

Natural Areas Report is published three times a year for scientists and managers working in natural areas throughout the country. This issue was supported by the USDA Forest Service Region 10 natural area program. Send ideas, letters, and comments to:

Natural Areas Report
Pacific Northwest Research Station
3200 Jefferson Way
Corvallis, OR 97330
541-750-7360



Printed on recycled paper

Official Business
Penalty for Private Use, \$300