

EXECUTIVE SUMMARY

Across the state, Alaskans face the difficult but rewarding task of planning a healthy future for the people and communities of Alaska. The decisions we make today – or fail to make today – about the use of our lands and waters have important consequences for the future of our economy and our environment. A powerful question is inherent in all these decisions – how much is enough? That is, how much development is enough? How much conservation is enough? What places are the most important to conserve?

Since 1999, The Nature Conservancy and its partners have been developing working answers to these questions through conservation assessments of Alaska's ecoregions. By the end of 2004, we completed assessments for six of eleven ecoregional planning units. We have used the experience and relationships gained through these smaller-scale assessments to develop a statewide assessment – a conservation blueprint for Alaska. The blueprint addresses three questions about biodiversity in Alaska:

1. What are the places most important for conserving the biodiversity of Alaska?
2. How many of these places are already under long-term conservation management?
3. Which of these places are most at risk due to human activities in the near term?

To answer these questions, we launched a project to design a *Conservation Blueprint for Alaska*. The project resulted in four products: a portfolio of areas of biological significance in Alaska; a spatially explicit assessment of human impacts on biodiversity; an assessment of the conservation status of lands in Alaska, and descriptions of each of Alaska's thirty-two ecoregions.

Alaska

Alaska's 365 million acres span roughly 21 degrees of latitude and 43 degrees of longitude, with 70,800 km of coastline, more than the rest of the U.S. combined. The position of Alaska between the cold Arctic Ocean and warmer North Pacific Ocean, widespread coastline and islands, high mountain ranges and ice fields, and the large size of the state contribute to overall biological diversity. Elevations range from sea level to the highest mountain in North America, Denali, at 20,320 feet (6194 meters). Topography, climate, wildlife, vegetation, and human communities within this expanse are diverse and the range of variations is dramatic. This variety of geographical extent is reflected in a great diversity of precipitation, temperature, and vegetation in the state, from the temperate rainforest in the southeast panhandle to the arid tundra of the Arctic coastal plain. Variation in number of frost-free days is great, ranging from more than 200 days in portions of southeastern Alaska and the Aleutian Islands to 40 days in the Arctic. Precipitation ranges from roughly 10 inches in the Arctic to around 200 inches in parts of southeastern Alaska. Less than 1 percent of the landscape has been altered by agricultural, industrial, or urban development, so large-scale ecological processes continue with little human interference. For example, over 6 million acres of taiga burned in the summer of 2004, and caribou migrate hundreds if not thousands of miles annually.

The rich mosaic of landscapes and wildlife in the state can be characterized by its ecoregions. Ecoregions are large areas of land and waters that contain groups of vegetation communities that share species and ecological dynamics, environmental conditions, and interactions that are critical for long-term species persistence. Within an ecoregion, similar biotic and abiotic conditions exist, defining the structure and function of the land, species, communities and ecological processes within that area. Scientists have

delineated 32 terrestrial ecoregions in Alaska; these ecoregions are either wholly in Alaska or extend from Alaska into western Canada or the Russian portion of the Bering Sea. The Nature Conservancy aggregated the ecoregions into 11 ecoregional planning units.

Portfolio Design

Each of the Conservancy's ecoregional assessments resulted in a map indicating areas of biological significance. Referred to as portfolios, these maps represent areas that, if managed for biodiversity, will likely conserve the native species and ecological communities of those ecoregions. The portfolio is a conservation blueprint – a vision for conservation success – to guide public land managers, conservation organizations, private landowners, and others in conserving natural diversity within the ecoregion. To design a statewide portfolio of areas of biological significance, we first identified conservation targets—species and ecological systems that represent the biodiversity of Alaska and are of conservation concern. Statewide conservation targets included 14 bird species and one bird group, 6 fish species, 7 mammal species and one mammal group, and 19 vegetation classes. To delineate areas of biological significance, we defined conservation goals for these species and ecosystems. Conservation goals have quantitative and spatial components to indicate where and how much to include in the portfolio. In addition to conservation goals, we used areas previously identified for their ecological importance to locate potential portfolio sites.

The statewide portfolio comprises 82.3 million ha and includes 219 areas of biological significance. The terrestrial portion of the portfolio contains 55.7% of the state. One hundred fifty-two areas of biological significance also have a marine component. The portfolio meets 20 of 22 breeding conservation goals for species targets and all 13 non-breeding goals and includes a minimum of 30% of all 9 featured habitats and at least 30% of 18 of 19 terrestrial ecosystems.

Human Activities Assessment

Alaska is unarguably the wildest landscape in the United States, and for many, the last great American frontier. However, to many who live in Alaska, there have been profound and dramatic changes that threaten this “wilderness,” and there is concern that increased resource extraction and development may harm Alaska's unique character. As part of the *Conservation Blueprint for Alaska*, we completed the first quantitative assessment of threats to the Alaskan landscape statewide, focusing on four types of human impacts: human access, mining, logging, and energy extraction. We adopted methods developed by the Wildlife Conservation Society, World Wildlife Fund, and United Nations Environmental Programme to conduct what has come to be called a “human footprint analysis.”

To quantify the pattern and the amount of potential impact caused by these activities in Alaska, we developed a spatially explicit model that quantifies the relative amount and pattern of human activity in each ecoregion in Alaska. We found that while all ecoregions in Alaska were being impacted by human activities, the level of human impact ranged from negligible to critical. The Cook Inlet Basin ecoregion, with the highest human population, had the largest amount of human activity, including high levels of human access and resource extraction (oil and gas, timber, and mineral). In general the human activities assessed were widespread around the state, but the impacts were localized.

Human activities have had little impact on most portfolio sites, with 127 sites (58.0%) showing less than 10% of area with higher levels of cumulative impact. Only 36 sites (16.4%) have greater than 20% of area with higher levels of cumulative impact.

Conservation Status Assessment

Because 89% of Alaska is owned by the state and federal governments, one could assume that conservation here is mostly about how these lands are managed as opposed to the need for protecting new lands through acquisition, legislation or private preserves. However, several researchers have shown that protected areas (e.g. parks and refuges) in other parts of the world are often the least productive and least desirable lands and that huge gaps in biodiversity conservation can exist in spite of a large network of protected areas. We examined the distribution of land management across Alaska and assessed how well the protected areas capture the terrestrial biodiversity of Alaska at a statewide scale and across the environmental gradients of ecoregions and elevation. First we looked at different land management types in Alaska, using the framework of the USGS Gap Analysis Program, and developed conservation management status categories appropriate to the level of development and human use in the state. Then we re-examined an earlier study of how well the protected areas represent vegetation classes, a surrogate for terrestrial biodiversity, at a statewide scale and added analyses for representation across ecoregions and elevation.

We found that while 43.6% of Alaska is managed for conservation, a disproportionate amount (41.3 %) of those lands occur at high elevations (above 510 m), which are typically less biologically diverse than low-lying areas. Taken at the statewide level, 5 of 19 vegetation classes are insufficiently represented in the existing protected areas (i.e. less than 30%), and when examining vegetation classes by ecoregion, 16 of 19 are found to be insufficiently represented in at least one of the ecoregions in which they occur.

We also assessed the potential contribution of Native-owned lands, which are the majority of private lands, to conservation of terrestrial biodiversity. If we assume that the largely undeveloped lands owned by Native entities are being managed for conservation, the representation of terrestrial ecosystems improves.

Nearly half (45.5%) of the portfolio is currently managed to conserve biodiversity to some degree. More than a quarter (27.5%) is managed primarily for human use and development. Private parties own 16.3% of the portfolio, with the largest group being Alaska Native corporations (13.3%).

Prioritizing Conservation Action

The portfolio of areas of biological significance for the state of Alaska contains 219 sites. Each site is important for conservation of the state's biodiversity, but no one organization could address the conservation needs of each site. To help prioritize immediate conservation action within the portfolio, The Nature Conservancy used the information gathered in the three main parts of the blueprint project – the portfolio, current conservation management status, and current human activities – to characterize each site in the portfolio.

Decisions about where to expend limited conservation resources are most often driven by imminent threat or biological importance. One organization may try to mitigate the damage of impending development. Another organization may decide to take a proactive approach and ensure that places of high conservation value are protected before they become vulnerable to development. To begin the process of deciding where The Nature Conservancy should focus conservation efforts, we applied a prioritization method that identifies places of high biological importance and high vulnerability.

Our initial results show that some regions with great conservation value are vulnerable to current land management intent and human activities. The sources of the vulnerability may provide a strategy for working with land managers or industry to protect biological resources in those regions.

Conclusions

From the conservation status assessment, we can conclude that the current level of conservation of Alaska's biodiversity is not as sufficient as numbers about land management alone would indicate. Some vegetation classes at low elevations require additional protection to ensure broad and widespread conservation across environmental gradients and to guard against changes in biodiversity related to climate change. For example, only 10.6% of wet sedge tundra in the state resides on lands managed for conservation. If the portfolio sites that include wet sedge tundra were to be managed for conservation, 83.5% of its distribution would be protected. Some of the most important places that are under-protected or at risk have coastal wetlands and temperate rain forests that represent a significant portion of what remains globally. These Alaska places – the Arctic coastal plain, western Alaska, and Southeast Alaska – may be more intact than the other places in the world where these habitats occur. Conservation management of large tracts of undeveloped Native-owned lands may provide some of the solution to adequately protect terrestrial ecosystems in Alaska.

Overall, the level of human activity remains low throughout Alaska. As expected, the most intense locations of human activity occur along the rail and road system. Some research suggests, however, that areas like Alaska, with comparatively low human impacts and mammals with high sensitivities to disturbance, may face a high potential risk of extinction of those species. Places with currently low levels of activity may be vulnerable long-term due to land management that does not include considerations for conservation. Some of the portfolio sites that show the highest current vulnerability due to human activities and/or conservation management status are large watersheds with important salmon runs. Conservation of these sites impacts not only habitats and species within the watershed, but may ensure the long-term survival of salmon populations passing through these sites on their way to spawning and rearing grounds further upstream.

In summary, this assessment is designed to focus conservation work in the immediate future, allowing conservation practitioners to quickly put emerging opportunities into the appropriate ecological context and to take actions that are scientifically defensible and result in the most biodiversity conserved. The ultimate goal is to conserve the entire portfolio of areas of biological significance. Such a goal requires balancing the needs of our communities with our ecological values. It will require a combination of strategies, including on-the-ground and community-based action at specific areas and multiple-area strategies to address threats to targets across ecoregions.

Finally, implementing careful strategies and filling gaps in our knowledge will also require partnership and commitment among the many stakeholders in Alaska. The Conservancy looks forward to working cooperatively with these individuals, agencies, businesses and organizations to translate this blueprint and future iterations into long-lasting conservation success on the ground.