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Setting the stage for the development of a science-based Tongass land management plan

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Abstract

This paper describes the physical nature of the Tongass National Forest, its salient natural resources, the social and economic importance of the resources, the complexity of the land management planning process, the chronology of the plan development, and the structure and function of the Pacific Northwest Research Station and Tongass National Forest planning partnership. Three features of the planning process were unique to the revision of the Tongass National Forest plan. First, a major goal was to produce a landscape-scale plan for long-term resource sustainability. Second, the 23-person planning team included six research scientists as full members. Finally, an agreement was reached between the Pacific Northwest Research Station and the Tongass National Forest to collaborate and obtain high-priority information needed for the next planning cycle. Benefits accrued to the Pacific Northwest Research Station by demonstrating the relevance of sound science in successful forest planning. Benefits also accrued to the USDA Forest Service Alaska Region in more informed, credible, and defensible decisions. Finally, benefits accrued at the national level when the process of conducting a science consistency check was incorporated into the regulations for forest planning.

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1. Introduction

The land and resource management plan for the nation's largest national forest, the Tongass located in southeast Alaska, was revised in 1995–1997. Three features of the revision process were unique and precedent setting in National Forest planning. First, the goal of the revision was to produce a landscape scale (6.9 million ha) resource use and conservation strategy that would

provide for the long-term sustainability of the resources of the Tongass, the last largely intact temperate rainforest in North America. The geographic scale of the Tongass, and the emphasis on ecosystem sustainability at that scale, set the planning effort apart from previous national forest plans.

Second, the revision was accomplished by a uniquely structured team of Forest Service managers from the Alaska Region and research scientists from the Pacific Northwest Research Station. The scientists, who were for the first time included as full members of a national forest planning team, were charged with assembling the science information base for the

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planning effort (Mills et al., 1998). In the course of searching, assembling, integrating, and synthesizing scientific literature relevant to the planning effort, the scientists identified critical gaps in scientific knowledge about ecological, social, and economic issues, relating to management of the Tongass (Shaw et al., 2000).

Finally, following successful completion of the revised plan, the Alaska Region and the Pacific Northwest Research Station agreed to undertake a 5-year, jointly funded, research program to address some of the previously identified, high-priority information gaps before onset of the next planning cycle. The science used in the revision, and the subsequent research results from follow-on studies designed to fill the gaps in knowledge, are contributing to an information base used globally to study and manage temperate rainforests. The research program was nearing completion at the end of fiscal year 2002, and information from a variety of studies has been published in the scientific literature (see e.g., Brooks and Haynes, 1997; Allen et al., 1998; Halupka et al., 2000; Caouette et al., 2000; McClellan et al., 2000; Witworth et al., 2000; Smith and Harke, 2001; Pyare et al., in press). It is the purpose of this paper to set the stage for the development of the Tongass land management plan (1997) by providing a brief description of the Tongass National Forest and its resources, an abbreviated history of forest planning from 1979 to 1997, the structure and function of the planning team that completed the 1997 plan revision, and the continuing research-management partnership that was responsible for the Tongass research follow-on studies.

2. Physical description of the Tongass National Forest

The Tongass National Forest is the largest remaining relatively unaltered temperate rainforest in the world (Lawford et al., 1996). It is, in many ways, our most diverse, and resource-rich national forest. The 6.9 million ha Tongass occupies ~7% of Alaska and ~80% of the land base of Alaska's panhandle. The forest is ~840 km in length and ~190 km in width (Harris et al., 1974), and is bordered on the south and east by high mountain ranges in British Columbia and on the west by the Pacific Ocean.

The Tongass consists of a narrow coastal strip of mainland and more than 21,000 islands ranging in size from <1 to ~650,000 ha. The island chain, known as the Alexander Archipelago, and the mainland are located between 54.5° and 60.5°N latitude and 141° and 130°W longitude (Fig. 1) (AFHA, 1995). Seven large islands, Prince of Wales, Kuiu, Baranof, Chichagof, Admiralty, Kupreanof, and Revellagigedo, dominate the island chain. The physical arrangement of the islands and mainland results in ~6900 km of convoluted shoreline with numerous bays, coves, and fjords (USDA Forest Service, 1997b). The large north-south oriented fjords are part of the Inland Passage that extends from Seattle, Washington, to Skagway, Alaska.

The topography of the forest is dominated by a coastal mountain range with mainland peaks up to 3000 m and island peaks to 1500 m. The physical characteristics of the land are closely related to the glacial history of the region. During the last glacial epoch, the area was largely covered by ice. The advance and retreat of the ice sheet scoured and shaped the landscape, resulting in characteristic U-shaped valleys and extensive fjords separating the islands. The land above 900 m consists mostly of exposed rock, ice fields, and glaciers. Many lowland valleys are rising rapidly in response to the retreat of glaciers and alleviation of the great weight of ice that formerly depressed the area (Hicks and Shofnos, 1965). The mountains, ice fields, islands, and fjords create a highly fragmented landscape consisting of a rich mosaic of forested lands interspersed with streams, rivers, fjords, fens, bogs, alpine meadows, rock, water, and ice (Fig. 2) that affect both the ecology and the economy of the region.

Southeast Alaska has a maritime climate, resulting from an eastward flow of warm ocean currents in the Gulf of Alaska (Harris et al., 1974). The dominant features of the weather in southeast Alaska include abundant precipitation and frequent gale-force winds that are the primary natural disturbances on the landscape (Nowacki and Kramer, 1998). The configuration of the coastline coupled with warm ocean currents and high coastal mountains provide the conditions necessary to produce abundant precipitation (Harris et al., 1974). Annual precipitation in southeast Alaska averages >250 cm, and is >500 cm in many southern areas. At higher elevations, >10 m of snow may fall annually, contributing to the ice fields and glaciers that dominate

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