

The Southeastern Alaska Timber Industry: Historical Overview and Current Status

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The story of the timber industry in Southeastern Alaska (Southeast) presents notable differences from, and similarities to, the story of the salmon fisheries in the region. Both had important antecedents in pre-European Native culture, grew from modest beginnings during Russian occupation of coastal Alaska outposts, and started as an unregulated business activity very shortly after the U.S. purchase of Russia. Both industries contended with Native claims to the natural resources of concern.

Although the federal government lacked any clear mission or institutional arrangement for effective management of the salmon resource, the U.S. Forest Service (USFS) from its inception had a clear mission of sustained yield forestry through regulation of harvest (Steen 1976, Dana and Fairfax 1980, Frome 1984, Clary 1986). The USFS in time encountered the limits of its early mission, as Alaskans and the national public demanded much more from the Tongass National Forest than the steady supply of wood fiber.

Concerns with forest management emphasized a fundamental biological difference between the salmon and timber resources. A generation of salmon renews itself in two to five years, depending on the species and population, whereas the forest requires a century to regenerate commercial timber and multiple centuries to reestablish the ecological characteristics of the old-growth forests that preceded timber harvest (Alaback 1982).

The timber resource also possessed inherent characteristics that made sustainable utilization challenging. Salmon could be counted on to arrive at the trap or fishing site at predictable times, but the pockets of high-value timber were scattered throughout

the forest. Many such stands were not easily accessible from the beach; some were virtually inaccessible by any means. Although the salmon industry enjoyed strong prices throughout most of the twentieth century, timber resources were a different story. Loggers and mill owners were always able to get a good price for high-grade spruce (*Picea sitchensis*), and recently for cedar (*Thuja plicata*, *Chamaecyparis nootkatensis*), but the majority of the forest yielded lower-grade logs that sold for a reduced price, if they could be sold at all (U.S. House of Representatives 1937, Rogers 1960, Rakestraw 1981). Market forces limited the timber industry to piling and high-quality lumber until after the Second World War, and even then repeated slumps in pulp markets dogged the industry (Rakestraw 1981, Naske and Slotnick 1987, USFS 1987).

Before the U.S. purchase of Alaska from Russia in 1867, logging was limited to the needs of Tlingit, Haida, and later, Russian settlements (and some exports). The history of the Southeast timber industry after transfer to the United States can be understood in terms of 4 somewhat distinct periods. The early years of the timber industry spanned eight decades, from 1867 until 1947. Logging targeted specific, high-value trees or stands of large trees for which there was a ready market. In 1947, Congress passed the Tongass Timber Act authorizing and endorsing long-term timber contracts to support pulp mills in Southeast. These years marked the years of ascendance for the pulp endeavor. Beginning in the 1970s and continuing through the 1990s, were years of conflict and change for the USFS pulp program and for the timber industry as a whole. They were also years of very active logging and timber export from lands transferred from the

Tongass National Forest to the private Native corporations established by the Alaska Native Claims Settlement Act of 1971 (ANCSA). During the 1990s, the region's two pulp mills closed permanently. By the end of the decade, the vast majority of the Native corporation timberlands had been harvested, and logging on private land declined precipitously. The close of the century brought the industry to significant transition years, in which the characteristics and scale of the regional timber industry were changing substantially.

THE EARLY YEARS OF THE SOUTHEAST TIMBER INDUSTRY

The early years of the timber industry begin with change to the industry that had evolved before the Second World War. The discussion below describes those early years and examines the development of the USFS policy on pulp mill development during the same span of years.

The Early Independent Timber Industry

Early Alaskan logging and sawmilling got a jump start with the advent of two regional markets for logs and lumber. In 1880, gold was discovered near present-day Juneau, and in 1888, the Klondike discovery brought additional waves of prospectors and mine workers up the inside passage by steamship to Skagway, the "desembarcadero" for the Interior gold fields (Naske and Slotnick 1987). At the same time, salmon canneries were being built throughout Southeast. Those facilities used logs for piling, lumber for construction, and in some cases, fuel wood to provide steam for canning retorts and to generate electricity (Moser 1899, 1902). In 1909, about a third of the timber cut on the Tongass was used for salmon cases, fish traps, and piles (Jim Mackovjak, forest historian, Eugene, OR, personal communication 11-06).

Trees were cut along the shoreline by hand loggers using axe and saw (Fig 1). The technique required that trees be felled directly into the water or on slopes near the shore so that gravity could assist the loggers in sliding a limbed tree to the water. The logs were then towed by boat to sawmills. In 1889, 11 small sawmills were operating in the region, including mills in Juneau, Ketchikan, Wrangell, Yakutat and on Prince of Wales Island. Early timber products included log piling, lumber, mine timbers, and salmon boxes (Rakestraw 1981).

An account of the hand logging days in Alaska describes Sitka spruce up to 10 and 12 ft (3-4 m) in diameter; thick stands of tall (200 ft [61 m]), straight western hemlock (*Tsuga heterophylla*) without a branch for the first 100 ft (30 m); and a thick stand of cedar trees 4 to 6 ft (1.2–1.8 m) in diameter (Jackson 1974). Hand logger Jackson backed up his accounts with photographs, and described some of the logs he towed to the mills. Boom logs to hold his raft of higher-value logs were 125-ft (38-m)-long spruce logs.



FIG 1. Hand loggers using spring boards to stand on and axes and hand saws to cut a large old-growth Sitka spruce in the southern Tongass circa 1900. The biggest, best quality, and most accessible trees were cut first throughout the forest. (USFS historical photo)

He describes sawlogs that consisted of a spruce, 120 ft (36.5 m) long and 6 ft (1.8 m) thick and "a straight, clean log" of 138 ft (42 m) in length containing more than 8 mbf (Jackson 1974).

Jackson (1974) described his beach logging as "selective cutting, or by amounts, so I could cut only the trees I wanted and let the rest stand." USFS accounts reported that hand loggers "took single trees

located on the shores of a beach or inlet...standard procedure was for the logger to go where he pleased and cut whatever he wanted, without getting permission from anyone” (Rakestraw 1981).

In 1891, Congress authorized the establishment of forest reserves, and in 1897, established the purpose of the reserves: “to furnish a continuous supply of timber for the use and necessities of the people of the United States ... to preserve and protect the forest ... [and] for the purpose of securing favorable conditions of water flows” (Steen 1976, Dana and Fairfax 1980, Frome 1984, Clary 1986). Forest reserves were established across the western United States, and in 1902, the Alexander Archipelago Forest Reserve was established by Presidential proclamation. President Theodore Roosevelt expanded the reserve and renamed it the Tongass National Forest in 1907, and further designations expanded the Tongass to 15 million acres (6 million hectares) by 1909 (Rakestraw 1981). More than 75% of Southeast was brought under jurisdiction of the new USFS in the Department of Agriculture, without consulting the Tlingit and Haida Indians or the other residents of the region (Dauenhauer and Dauenhauer 1994, Mitchell 1997).

Establishment of the Tongass National Forest had little practical impact on Alaska loggers and sawyers, however. Operations continued much as they had, with expansions of some of the sawmills to address the demand for high-quality spruce in airplane construction during the First World War. In 1920, a federal forester wrote: “Most of the timber accessible to tidewater (on west POW) has been culled over at least once, so that the remaining stands do not make practical hand logging areas” (K. Smith, in Rakestraw 1981). In that decade, a new technology, steam-powered “donkey” engines that pulled logs to the beach with a cable winch, came into play (Fig 2). Donkey engines extended the loggers’ reach from tidewater as far ashore as 4,000 ft (1,220 m). Steam donkeys and later diesel-powered cable yardarms, became the dominant technologies for dragging logs to tidewater (Rakestraw 1981). The hand loggers had cut individual prize trees from the shoreline, and the mechanized beach logging tended to harvest entire stands of timber from the shores. Select trees were the objective, and to get them to the beach, the timber between tree and shore had to be removed. The inland reach of the logger was limited by terrain, length of the cable, and power of the yarder’s engine. The early timber industry also reached effectively into markets in

Southeast as well as Puget Sound. According to Rakestraw (1981), “In 1913 the Territory imported 84 percent of its timber; by 1925 the percentage had been reversed.”



FIG 2. A-frame logging with a steam donkey along the shoreline of Edna Bay on Kosciusko Island northwest of Prince of Wales Is. Circa 1940s. Most of the shoreline with productive forests in Southeast has received some level of timber harvest. (Alaska State Library, Dora Sweeney, P421-301)

A federal assessment of the Southeast forests done for Congress by Frank Heintzleman in the mid-thirties (U.S. House of Representatives 1937) described the resource after decades of hand and beach logging, but before large-scale industrial timber development:

Perhaps as much as 75% of the timber of usable quality lies within 2½ miles [4 km] of tidewater. ... A large percentage of the timber can be logged directly into tidewater by the use of two and three donkey engines working tandem. ... The west coast of Prince of Wales Island and the numerous adjacent small islands contain an outstanding number of spruce areas with exceptionally large trees. These areas are supplying most of the present sawmill requirements of southeastern Alaska, as the trees yield a high percentage of clear lumber that can be exported profitably.

The assessment described the kinds of trees that were being logged at the time, noting that the average yield was 30–40 thousand board ft (mbf) per acre (12–16 mbf/hectare). It stated that the average mature Sitka spruce tree was about 5 ft (1.5 m) in diameter and 160 ft (49 m) in height and that 7-ft (2.1-m)-diameter and 200-ft (61-m)-tall trees are common. The assessment

described the largest known spruce tree in Alaska as 14 ft (4.3 m) in diameter at a point 6 ft (1.8 m) from the ground. The western hemlock trees were, on average, 3–4 feet (0.9–1.2 m) in diameter and from 100–140 feet (30–43 m) in height.

During the Second World War, the demand for Sitka spruce aircraft lumber again increased, and the federal government initiated the Alaska Spruce Log Program. A major logging camp was established on the west coast of Prince of Wales Island at Edna Bay on Kosciusko Island. Roads were built to provide access to the large, clear spruce trees that were abundant on the island, and select logs were harvested near the shores of adjacent islands. These logs were precisely the high-grade spruce stands described five years earlier in the report to Congress. Some spruce was milled in Alaska, but almost all was towed in log rafts to the Puget Sound area for manufacture into precision aircraft structures (Rakestraw 1981). The Alaska Spruce Log Program boosted annual timber harvest in the region, from about 30 million board ft (mmbf) per year before the war to a peak of 87 mmbf in 1944 (USFS 2003); however, these levels were modest compared to what would accompany future industrial-scale forestry on the Tongass.

Reflecting on the early years of the timber industry, federal forester Arthur Greeley (1953) stated:

A lumber industry has been in existence in the Panhandle for a great many years. This industry has been based on the manufacture of spruce lumber to fill local needs, and for export from the Territory when export markets were available. Export markets have usually been available for the higher lumber grades and for specialty products such as piano-sounding boards. The log supply which has kept this industry going has come from the pockets of timber with the highest proportion and quality of spruce.

Early Forest Service Pulp Mill Advocacy Efforts

Pulp mill development began taking shape in 1899 when railroad magnate Edward Harriman invited a party of federal officials and noteworthy citizens on a coastal Alaska exploratory cruise. On board was the former head of the federal Division of Forestry, Bernard Fernow. Fernow's assessment of the forest was pessimistic, noting the rugged terrain, the scattered stands of prime timber in a forest otherwise marginal

for wood products, and the long distance to significant markets. His conclusion was that "this reserve will, for an indefinite time, be left untouched except for local use ... unless it be that the spruce could be turned into paper pulp" (Fernow 1901). Fernow's prognosis, coupled with the USFS utilitarian mission, launched a dedication to pulp mill development that characterized the USFS in Alaska for nearly a century (USFS 1910).

While early foresters were occupied with boundary surveys and getting a handle on the logging already taking place in the Tongass, the USFS leaders began the quest for pulp mills in Alaska. In 1910, the results of two USFS surveys recommended rapid liquidation of the Tongass old growth for pulp. In 1921, the agency published a proposal for 14 pulp mills, each surrounded by a tract of forest dedicated to its supply and near a stream suitable for hydroelectric power (Rakestraw 1981). In 1927, B. Frank Heintzelman, who became regional forester and later Territorial Governor of Alaska, published a report asserting that pulp mills would be the "basis for permanent development" in Alaska (Heintzelman 1927).

Heintzelman played a leading role in the 1937 Alaska resource assessment for Congress (U.S. House of Representatives 1937), which proposed establishment of special timber allotments for each of at least five planned pulp mills. The assessment report envisioned continued logging of the most lucrative stands of timber first, starting at tidewater and working inland. It stated: "Initial sales within an allotment will ordinarily include those timber units most accessible to tidewater, the more inaccessible units being left for later exploitation."

In spite of steady USFS advocacy, efforts to recruit investments and establish pulp mills in Alaska failed repeatedly. At least eight large pulp sales were attempted without success. The first attempted pulp timber sale was in 1913 near Wrangell, but it received little interest (J. Mackovjak, personal communication 11-06). Pulp timber sales up to 5 billion board ft in size were offered for sale on the Stikine River, in Behm Canal near Ketchikan, Port Snettisham and the Glass Peninsula near Juneau. The reasons outlined by the USFS were low export prices, high freight rates, and poor markets (Kellogg 1923).

Although the pulp mill recruitment efforts failed, the USFS put in place, step by step, a set of forest management policies that became the foundation of Tongass forest management. One set of policies addressed management of the forest and another

revolved around the type of contract that would be necessary to overcome the inherent economic and geographic obstacles that discouraged potential pulp mill investors.

Sustained-yield forest management was required by law in all national forests, yet the relative or absolute quantity of annual harvest to be sustained was not specified. The USFS possessed an institutional orientation toward maximization of a single resource, wood fiber. At the national level by the 1940s, sustained yield had become maximum sustained yield (Clary 1986), and in Alaska, that translated to maximum levels of pulp mill timber. A dominant use policy in the Tongass eventually led to a stated intent to cut more than 95% of the old-growth forests in the Tongass to convert the entire forest to a pulp wood plantation (USFS 1960). This timber harvest was to be achieved by clearcut logging. The policy, called “full utilization,” would require loggers to cut all the trees in a timber stand and transport all of the logs to the mills.

A corollary objective was social in nature, the maximization of year-round jobs in pulp and lumber manufacture in Alaska. This objective stemmed from full utilization and was to be achieved by forcing the manufacture of a product from every log. Export of unprocessed “round logs” would no longer be allowed, except with a special waiver from the USFS. The log export ban was known as the “primary manufacture rule.” It was established in 1928 to guarantee that timber would be available when pulp mills finally became established (J. Mackovjak, personal communication 2006). Although primary manufacture could entail little more than sawing slabs off the sides of a log, it marked a significant change in timber practices. Because manufacturing in Alaska tends to be more costly than the same processes elsewhere, however, the primary manufacture rule amounted to an economic penalty. For some log grades it was, and is, more profitable to export the logs in the round.

Through trial and error, and by merging national forest policies with tailor-made Alaska provisions, the USFS arrived at a formula for pulp timber-supply contracts designed to make them as attractive as possible to potential investors. The agency would guarantee a 50-year supply of timber sufficient to operate a pulp mill and a companion sawmill. Timber would be prepared for harvest in 5-year blocks, and the pulp company would take the lead in identifying priority harvest areas. The noncompetitive, sole source timber sales would be appraised on a residual basis,

whereby the federal government would deduct the costs of logging and manufacturing from the value of the logs. The cost of building logging roads would be credited against the timber sale payments; the government would trade trees for logging roads. These provisions, derived through experience and negotiation with potential investors, were designed to help pulp mill investors amortize capital investments and achieve profitability in the face of significant economic obstacles.

In perhaps the most thorough assessment of USFS policy of the time, Alaska economist George Rogers (1960) wrote:

Whether this be mercantilist folly, the most thoroughgoing under the American flag, or whether it be wisdom of a far-reaching sort, has been and still is being heatedly debated. ... Forcing construction of new physical plants at great cost in one part of the nation when existing plants in other areas accessible to the Region’s forest resources are operating below capacity, fostering location of the processing of the raw material in a high-cost area remote from the markets, these and a whole list of other consequences could be brought forth to prove the policy guilty of creating a gross misallocation of capital and labor resources with corresponding costs to the economy of the nation as a whole.

If the geographic boundaries of our primary concern are drawn to embrace only the local area, the proponents of the policy are able to counter with all the familiar protectionist arguments plus the added argument that long ago it had been decided (on political rather than economic grounds) that the further settlement and economic development of Alaska is to be an established national policy.

ASCENDANCE OF THE PULP MILLS

After World War II, a newsprint shortage in the 48 contiguous states led to the first real interest in Tongass timber on the part of the pulp and paper industry. The rebuilding of Japan as an American ally required a timber supply Japan did not possess. The Tongass

emerged as a possible supply of lumber and pulp (Rakestraw 1981). In 1944, the federal Sustained Yield Act had authorized USFS dedication of timber supply areas to specific wood product companies in the name of community stability and development. In so doing, the government created “sanctioned monopolies” as part of a policy of using sustained yield forestry as the basis for rural social and economic engineering (Clary 1986). In Alaska, the salmon industry was not strong and political leaders were eager for additional economic diversification and year-round jobs. These economic and political forces contributed to establishment of the two pulp mills that dominated Tongass management during the second half of the twentieth century.

Tlingit and Haida land claims emerged as a new challenge to the USFS pulp development plans. In 1935, Congress passed the Tlingit and Haida Jurisdictional Act, authorizing the Indians to pursue land and resource claims in federal court (Haycox 1996, Dauenhauer and Dauenhauer 1994, Mitchell 1997). The Interior Department aligned with the Natives against the USFS. In 1946, armed with documentation including the Goldschmidt and Haas report on Native “possessory” land ownership rights, Interior attorneys advanced the Haida and Tlingit land claims (Haycox 1996, Goldschmidt and Haas 1998).

Three interests were threatened by the Native claims. Because the claims struck at the heart of the USFS vision, potential pulp mill investors backed off pending resolution of the issue (Rakestraw 1981). The salmon canneries opposed Native land claims, and made their opinion known in Washington (Haycox 1996). They wanted to protect their access to the fishery, as well as their ownership of cannery and trap sites. Alaska political and business leaders did not want to lose the opportunity to develop the timber resource. One of these leaders, Frank Heintzelman, was a powerful figure linking forestry and territorial government policies (Haycox 1996, Rakestraw 1981).

The result of the Native possessory rights conflict was passage by Congress of the Tongass Timber Act in 1947, which authorized up to five pulp timber sales in the Tongass and placed revenue from the timber sales in escrow pending the outcome of Native claims, on which it deferred (Haycox 1996). The Tlingit and Haida Indians would eventually, in 1968, win a \$7.5 million settlement from this escrow account as settlement of their claim to lands included in the Tongass National Forest (Haycox 1996, Dauenhauer

and Dauenhauer 1994). Actual land ownership, however, would not be awarded to Alaska Natives until 1971.

With passage of the Tongass Timber Act, the establishment of pulp mills was finally assured. Ketchikan Pulp Corporation (KPC) signed a 50-year timber contract with the USFS in 1951. At the time, the mill, constructed for \$52.5 million, was the largest single industrial development made in the Territory of Alaska (Alaska Office of the Governor 1997). The Alaska Lumber and Pulp Corporation (ALP), a Japanese company, signed a similar contract in 1953 and built a pulp mill in Sitka. A third timber sale was made near Wrangell, but no pulp mill was constructed, and the Wrangell sawmill was purchased by ALP (Rakestraw 1981).

By this time, the foremost timber inventory specialist with the USFS, Ray Taylor, warned that the forest could not support five pulp mills and called for a new timber inventory to determine how much pulp development the forest could sustain. Taylor’s warning was not heeded. The agency moved forward and a fourth 50-year timber sale was made on Admiralty Island in 1964, touching off a battle with hunters and environmentalists that led to cancellation of the sale and, ultimately, to the designation of Admiralty Island as a national monument (Rakestraw 1981).



FIG 3. The Ketchikan Pulp Company mill in Ketchikan's Ward Cove in the early 1980s. Both the Ketchikan and Sitka pulp mills had 50-year timber contracts on the Tongass which dominated the timber industry in Southeast from the mid 1950s through early 1990s. (John Schoen)

The two pulp mills that became established in Ketchikan and Sitka dominated the timber industry, the Tongass National Forest, and the regional economy for nearly half a century (Fig 3). The contracts were signed at precisely the time the salmon runs achieved “disaster” status, and industrial timber development

was seen as the new regional economy. The USFS commitment to sustained yield, and to supporting year-round jobs in Alaska communities, looked good compared to federal mis-management of the salmon resource and control of that industry by outsiders (Rogers 1960). The contracts were a political milestone for Heintzelman, who resigned his post as regional forester in 1953 when he was appointed Territorial Governor, a post he held until 1957.

The long-term timber contracts were advantageous to the pulp companies, by design. Each contract was 50 years in duration; together they obligated the USFS to provide 13.5 billion board ft of timber to the pulp companies. Timber was planned for harvest in 5-year allotments, with the pulp mills taking the lead in selecting the harvest areas. Each mill had a specified harvest area, along with a backup or contingency area. Timber prices were set by residual appraisal, and the USFS absorbed most of the logging and manufacturing costs. In addition, the contracts awarded the pulp company credits, dollar for dollar, for logging roads they built. The companies could exchange these credits for timber in lieu of cash (USFS 1951, 1956).

Supplying the pulp mills with wood became the dominant USFS objective for all lands in the mill contract areas. The regional forester stated in 1953: “It has never been thought necessary to leave any substantial volume of timber uncut as a streamside protection measure” (Greeley 1953). The 1960 USFS plan for the Tongass called for clearcutting 95% of the Tongass “as soon as possible to make way for new stands of fast growing second growth timber” (USFS 1960). Maximizing production of pulp wood, through farming of young growth timber stands, was the USFS vision for the Tongass forest.

Socially and economically, the pulp mills were a great success for at least the first several decades of operation. Each mill employed as many as 500 workers, and jobs in the woods mushroomed to provide the timber. Tractor logging and hi-lead cable logging from newly constructed roads became the norm (Fig 4). Timber harvests increased from about 50 mmbf per year to well above 350 mmbf annually (USFS 2003, 2004a). The mills were presented by statehood advocates as evidence that Alaska had entered the industrial age and deserved the same status as the other 48 states. Generations of Alaskans worked in the pulp mills and their logging camps. High-quality lumber was exported, primarily to Japan, along with pulp exports to Japan and the Northwest (Rakestraw 1981,

Alaska Office of the Governor 1997). The years from 1947 through 1970 were golden years for the USFS and the timber industry in Southeast, which saw the early vision of regional development based on pulp mills become a reality.



FIG 4. High-lead cable logging like this site on southeastern Chichagof Is. is the dominant methodology used throughout Southeast today, although helicopter logging is also used in a few situations. (John Schoen)

YEARS OF CONFLICT AND CHANGE

In 1971, Congress passed ANCSA (Public Law 92-203), which addressed Native land claims statewide. In Southeast, a regional Native corporation, Sealaska Corporation, was authorized to select approximately 268,000 acres (108,456 hectares) of land from within the Tongass National Forest. Twelve Native village corporations were authorized to select approximately 23,000 acres (9,308 hectares) each. The new corporations generally sought to maximize the value of their selections, and the USFS lost management authority for half a million acres (202,343 hectares) that included some of its best timberland (Knapp 1992; USFS 2003, 2004a).

All Native residents of Southeast were shareholders in Sealaska Corporation, and nearly all were also shareholders in a village corporation. The Native corporations were private businesses, not bound by the primary manufacture or sustained-yield requirements that apply to national forests. Maximizing value typically involved rapid harvest of the old-growth timber, which was exported in the form of unprocessed logs (Fig 5). By the year 2000, the village corporations had harvested all of their timber; Sealaska continued to cut and export about 100 mmbf per year (Knapp 1992, USFS 2004a).

In 1976, the Champion Plywood Company and USFS voluntarily ended their pulp timber contract on Admiralty Island. This event was the first major



FIG 5. Native corporation logging on Dall Is. southwest of Prince of Wales Is (top) and northwest Admiralty Is. Unlike recent Forest Service clearcuts which are smaller and form a patchwork across the landscape, corporation lands were generally clearcut in large contiguous blocks. Native corporations selected the best timber lands available from the Tongass National Forest. (John Schoen)

setback for the timber industry, and a victory for the growing Alaska conservation movement. Opponents to the Admiralty sale included Alaskan hunting guides and fishermen, Native residents of the island, and local and national conservation groups (Rakestraw 1981; Sierra Club Legal Defense Fund 1990; Alaska Geographic 1973, 1991). A pivotal issue in the sale was the impact that extensive clearcut logging might have on the rich wildlife resources of Admiralty Island. A study report from independent biologists retained by the timber company found that significant and specific impacts on black-tailed deer (*Odocoileus hemionus*), brown bear (*Ursus arctos*), and other species were likely (Leopold and Barrett 1972). It was the first time that professional expertise beyond the USFS staff challenged the agency assumption that logging would have little or no impact on other resources.

Simultaneously, momentum was building for establishing designated wilderness areas in the Tongass. ANCSA included a provision calling for a review of the federal lands in Alaska to identify areas to be preserved as national parks, wildlife refuges, and other designated lands. By 1977, Southeast was included in a national campaign to protect Alaska wilderness lands (Cahn 1982). In 1980, the Alaska National Interest Lands Conservation Act (ANILCA) (Public Law 96-487) became law, establishing 5.4 million acres (2.2 million hectares) of wilderness areas in the Tongass. Aside from portions of Admiralty Island National Monument, however, many of the wilderness designations in the Tongass were dominated by scrub forest, muskeg, rock, ice, and alpine tundra with relatively poor timber values. In the final bill, timber supply areas of the pulp companies were not affected. The timber industry was bolstered by provisions mandating a timber supply of at least 450 mmbf annually and a guaranteed federal subsidy of at least \$40 million per year. The result was that the pulp companies actually strengthened their position in the Tongass.

What looked like a victory for the timber industry began to unravel, however. Biological research revealed that Sitka black-tailed deer, a major source of food for residents, rely on old-growth forest stands, particularly in the winter when such stands afford both shelter and food (Wallmo and Schoen 1980). More specifically, deer prefer the rare, low-elevation, large-tree stands during deep-snow winters because they provide optimal foraging areas with the lowest-snow accumulations (Schoen and Kirchhoff 1990). Refer to chapters 5 and 6.1 for more details on old-growth forests and deer, respectively. These large-tree stands were similar to some of those most attractive to the early hand loggers and beach loggers, who had already high-graded (i.e., cut the best and left lower quality trees) many of the low-elevation, large-tree stands over much of Southeast (Rakestraw 1981).

Analysis of USFS data on timber inventory has revealed that the pattern of high-grading the best forests continued as industrial logging extended its network of logging roads inland (USFS 1995, USFS 2003) (refer also to Chapters 2, 3, 4, and 5). These rare, large-tree stands, which are the most valuable ecologically, have been harvested in greater proportion than their abundance throughout Southeast (Fig 6). For example, although only about 5% of the Tongass was logged between 1954 and 1988, most of that harvest



FIG 6. Large-tree logging on Long Is. southwest of Prince of Wales Is. Over the last century, the timber harvest in Southeast has focused on the most accessible and valuable large-tree stands. This targeted harvest (sometimes termed highgrading) has substantially reduced the amount of large-tree old growth and reduced forest diversity across the Southeast rainforest. Scientists are concerned about the effects of this targeted harvest on fish and wildlife species that depend on those rare forest habitats. (Jack Gustafson)

occurred in highest volume (large-tree) old-growth stands (USFS 1995). Forest inventory data were consistent with this message, showing that the average volume per acre of uncut forests in the Tongass declined from 31.4 mbf/acre (12.6 mbf/hectare) in the 1950s to 24.3 mbf/acre (9.7 mbf/hectare) in the 1980s. USFS records indicate that some 18 billion board ft of timber had been harvested in the Tongass National Forest between 1909 and 2000 (USFS 2003, 2004a). According to the USFS, that timber came from about 400,000 acres (160,000 hectares) of timberland (USFS 2004b). Although this timber volume equates to an average harvest of approximately 45 mbf per acre (18 mbf/hectare), the USFS's timber inventories in the 1970s and 1980s indicated the average volume for all commercial forest lands was only about 24 mbf per acre (10 mbf/hectare). These data lead to the inescapable conclusion that harvests through time were concentrated significantly in the high-volume (large-tree) old-growth stands. However, not all high-volume forests are alike. Some high volume is comprised of lower densities of large-diameter trees, and some is comprised of higher densities of medium diameter trees (Caouette et al. 2000, Caouette and DeGayner 2005).

As shown in Figure 7, higher timber volume classes (V67) correspond to lower densities of large diameter trees, and lower timber-volume classes (V5) corresponds to high volumes with high densities of medium-diameter trees (refer to Chapter 5 for more

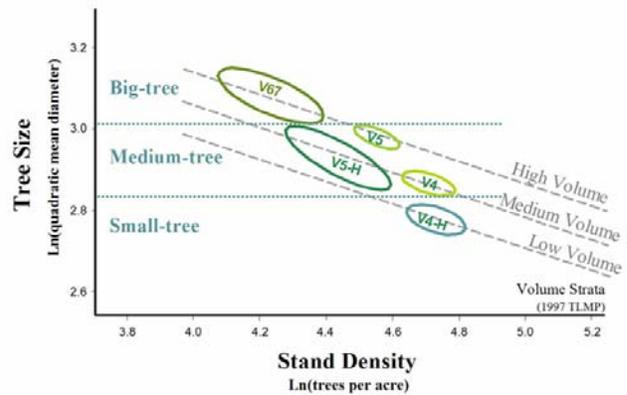


FIG 7. Forest-wide averages and 90-percent confidence ellipses for five GIS-classified mapping groups derived from four productive old-growth timber-volume classes (Tongass timber-type map) (Caouette et. al., 2000).

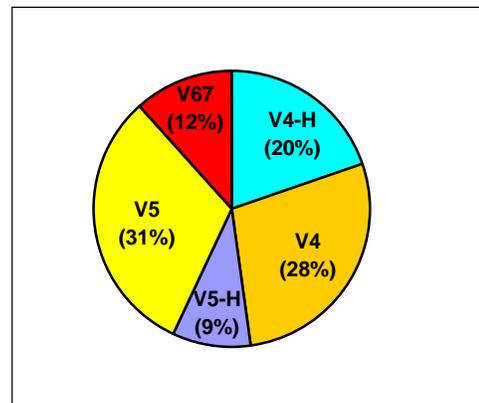


FIG 8. Percentage of productive old growth (POG) mapped by five new GIS-classified mapping groups derived from the original four POG timber-volume classes (V4, V5, V6, & V7 from the Tongass timber-type map) (Caouette and DeGayner 2005). The large-tree old-growth types (V67) are much more rare than the medium-tree (V5, V5-H, V4) and small-tree (V4-H) old-growth types. However, much of the harvest in Southeast has targeted the large-tree (V67) types.

details on relationships between timber stand volume and tree size and density). Both types of high-volume are targeted for timber harvest (i.e., high-graded), but the large-tree types (V67) are a relatively rare feature on the landscape (12% of productive old growth [POG] vs. 31% of POG for V5) and therefore these forest types are at greater risk of being over harvested (Fig. 8). Some landscapes like northern Prince of Wales Island, southeastern Chichagof Island, northern Baranof Island, and Heceta Island have been subjected to high levels of large-tree harvest (Fig. 9). The result, indicated by the new wildlife research, would be long-term impacts to wildlife populations that depend on those specific forest communities for habitat (Schoen et al. 1988).



FIG 9. Forest mosaic of clearcuts, second growth, and old growth on east central Prince of Wales Is. near Twelve Mile Arm. Prince of Wales Is. has had substantial timber harvest and much of the highest quality old growth has been replaced by younger forests in various stages of succession. (John Schoen)

The wildlife research was complemented by new research in fisheries biology illustrating the importance of protecting the forest habitat alongside salmon streams from logging and related impacts (Murphy and Koski 1989). By the 1980s, the salmon restoration program of the State of Alaska had achieved great success. Salmon runs were abundant, prices were strong, and protecting important salmon habitat was a priority.

Concern about clearcut logging also increased in the communities throughout Southeast. The timber subsidy financed logging roads into areas farther from the pulp mills, where local residents had never expected to see clearcuts. The mandated harvest level required that the USFS meet its timber harvest objectives, regardless of local concerns. Native and rural residents living subsistence life styles questioned the USFS logging program, concerned that habitat loss would lead to a shortage of game and fish, and brought suit under Title VIII of ANILCA.

At the same time, tourism was expanding in Southeast, bringing large numbers of visitors to the region to enjoy the scenery, wildlife and fish, and wilderness. With tourism came jobs and new economic options, as well as a new market for the natural beauty of old-growth forests and associated wildlife.

The USFS was confronted by a diverse spectrum of interests, many of which placed a high value on intact, old-growth forests. The USFS management program and budget emphasized timber supply to pulp mills and conversion of the old-growth forest to timber plantations, consistent with the priority of the Alaska Congressional delegation. That priority was hampered

by the fact that the USFS appeared to be spending more on timber sales than it received in timber revenues, which led to criticism from both environmentalists and fiscal conservatives that continued to increase over time (USFS 1986, U.S. General Accounting Office 1988, U.S. Congressional Research Service 1994, Sedjo 2004).

Additional challenges affected the core of the timber industry. In 1981, a group of independent logging companies won a lawsuit alleging the pulp companies used their monopoly positions to control independent logging. The courts awarded triple damages, ruling that the pulp companies “began with a natural advantage in the form of the 50 year leases...[and] utilized this advantage as the starting point to control the Alaska timber market, to eliminate competition, and to maintain and exercise monopoly power. ...With a drop of the executioner’s sword, the defendants could cut off a logger’s financing, force the logger out of business, and acquire the company or its assets” (Reid Brothers Logging Company v. Ketchikan Pulp Company 1983).

In spite of a significant federal subsidy, economic considerations did not bode well for the pulp companies. Naske and Slotnick (1987) noted: “The timber industry in southeastern Alaska has fallen on hard times. Oversupply and soft markets have plagued it for a number of years, and there are fears that one of the two pulp mills in southeastern Alaska may shut down permanently within the next few years.”

Information unavailable at the time, discovered later in legal proceedings, revealed that the primary importance of ALP (later known as Alaska Pulp Corporation [APC]) to Japan was as a source of raw material for other domestic manufacturers, and its profitability was not the top priority. The ALP debt increased from \$20 million in 1964 to more than \$70 million in the mid-70s. The reconstruction of Japan long accomplished, ALP management sought profitability beginning in the 1980s. In 1984, the ALP mill in Sitka initiated a major program of cost reduction, including a 25% wage reduction. A proposal for a second 25% cut led to a strike, and ALP broke the union, leading to bad relationships between workers and management (U.S. Court of Claims 2004).

Ironically, the pulp mills became the target of some criticisms previously leveled at the canned salmon industry before statehood. A timber development strategy that was once presented as a sustainable economic alternative to the depleted salmon fisheries

now took on some of the same monopolistic appearances that previously had alienated Alaskans from the canned salmon industry.

In 1990, Congress passed the Tongass Timber Reform Act (TTRA) (U.S. House of Representatives 1990) as an amendment to ANILCA. It protected a million acres (0.4 million hectares) of land, with high value for wildlife, fish, and local community uses, from logging and road building. It also repealed both the mandated timber supply and the guaranteed subsidy provisions of ANILCA. The clear intent of the law was to place the Tongass on equal footing with other national forests, and to foster a multiple resource approach to management.

The TTRA also contained a provision that required harvesting of timber stands in proportion to their occurrence in the forest, rather than targeting the large-tree (high-volume) stands. Although this provision was later ruled to apply only to the 50-year contract areas of the pulp companies, the intent of Congress was to end high-grading in the Tongass (U.S. General Accounting Office 1990).

Some foresters took offense at the allegation of high-grading. Maximum timber production during the long term required converting old growth on the most productive sites to young, vigorous second growth. By using cost-benefit analysis, foresters could demonstrate that “high-site forestry” focused on the most productive timber sites could maximize long-term wood production and timber sale revenues (Davis and Johnson 1987). The Alaska timber industry routinely faced the challenge of squeezing profits out of timber operations with some of the highest road building, logging, and manufacturing costs in the world (Robertson and Brooks 2001).

The TTRA was considered a compromise that would provide some predictability to management of the Tongass after more than two decades of controversy over Native claims, wildlife and fish habitat, wilderness preservation, and the timber program itself. Changes in the timber industry, however, began redefining Tongass management within a few years.

Export markets for the dissolving pulp produced in Southeast were notoriously erratic. Some economists described the remote access to market surges that characterized the operations of the high-cost pulp producers as the “last in and first out,” a pattern that exacerbated the impacts of market swings (USFS 1987). After one such market resurgence in the early

1990s, Alaska pulp was out of a market. According to a Governor’s task force (Alaska Office of the Governor 1997): “At the end of 1992, excess production left producers with record inventories of chemical grade market pulp. Mill closures and extended downtime throughout 1993 finally pulled inventories back in line with demand but not until inflation-adjusted prices for most grades had dropped to their lowest point since the 1930s.” Markets for sawn wood products were not much stronger. Robertson and Brooks (2001) assessed the market position of the industry from 1985 to 1994 and found that “data consistently indicate that Southeast Alaska has been a high-cost producer of sawn-wood products operating at the margin of profitability.”

After passage of the Tongass Timber Reform Act in 1990, the USFS was still obligated by contract to supply timber to the pulp mills. That obligation decreased in 1992 when ALP, then called APC, announced the closure of the Sitka pulp mill with no intent of reopening. APC blamed the closure on the provisions of the TTRA and sued the government for damages. The USFS terminated the timber contract, finding APC in breach of contract for not upholding its obligation of mill operation. Federal courts finally disagreed with both parties, finding APC was not in breach at the time, and that the TTRA was not the cause of the closure. The court cited weak markets and rising debt, in advance of and independent of the TTRA, as primary causes for the closure (U.S. Court of Claims 2004).

The impact on the USFS was to alleviate a big part of its logging obligation. The impact on Sitka and Wrangell, where APC had its pulp mill and saw mill, respectively, was direct and intense. At the time the pulp mill was the largest employer in Sitka, accounting for more than 10% of the jobs and 17% of earnings. Nearly 400 people lost high-paying, year-round jobs. The Sitka population fell nearly 5%, then stabilized (Boucher 1998, Tromble 1998). The surprise was that Sitka weathered the closure without the predicted economic collapse. Ten years later there were more jobs in Sitka than ever, although the value of earned wages had declined. The impact was undeniable, yet the town made a relatively “soft” landing. What provided the cushion? Regional health care and education institutions, commercial and charter fishing, and increasing numbers of visitors buoyed the economy (Alaska Department of Labor 2003a, 2003b).

Passage of the TTRA and closure of the Sitka and Wrangell mills brought big changes to Tongass management. Between 1989 and 1997, the USFS revised the Tongass Land Management Plan (TLMP), its primary management guide. As completion of the plan approached, new challenges emerged. Lawsuits were filed, charging that logging old-growth forest violated the Endangered Species Act (ESA) by jeopardizing the survival of the Queen Charlotte goshawk (*Accipiter gentiles laingi*). Suits for additional species—marbled murrelets (*Brachyramphus marmoratus*) and Alexander Archipelago wolves (*Canis lupus ligoni*)—were threatened. To avoid severe restrictions in logging in conforming with the ESA, the USFS developed measures to protect wildlife habitat for inclusion in a new plan. The sufficiency of these measures depended, in large part, on habitat protection of valuable, large-tree stands of old growth—precisely the stands most lucrative for the industry to harvest (DeGange 1996, Iverson et al 1996, Person et al 1996).

The Alaska Congressional delegation has been unified in its support of pulp mill operations and the timber industry throughout Southeast. In 1995, Senators Ted Stevens and Frank Murkowski attempted to pass legislation mandating a timber supply capable of maintaining 2,400 “direct timber jobs” in the Tongass (U.S. Senate 1995). Although a harvest level of roughly 400 mmbf per year was implicit in the employment figure, the USFS had decided internally that the maximum sustainable logging level was probably less than 200 mmbf (Thomas 2004). When the Stevens-Murkowski bill failed because of opposition from the Clinton administration, the State of Alaska, and the USFS itself, Senator Stevens made an unsuccessful attempt to attach a similar provision to spending legislation. Although unsuccessful, the Alaska Delegation’s support provided a counterweight to efforts to further curtail the Tongass timber industry.

Another significant challenge to the timber industry was the impending closure of the pulp mill in Ketchikan. Louisiana-Pacific Corporation (LP) had bought KPC more than a decade before, and the financial stability of LP was in decline. Wood products companies began closing plants in areas with high production costs like Alaska, shifting investments to regions with lower costs or faster growing forests. Alaska’s primary Asian timber markets contracted dramatically. A recession in Japan reduced housing starts and was followed by the broader Asian economic downturn of 1997–98. Cheaper logs and lumber from

Russia displaced North American exports, as did wood from tree plantations in New Zealand and Scandinavia (Alaska Department of Labor 2003a). Eastin and Braden (2000) reported that Alaska exporters of primary wood products saw a 70% decline in annual revenue from 1993 to 1998. The causes included “the Asian economic crisis, declining international timber prices, lower cost competitors, changes in forest harvest regulations that led to a decline in Alaska’s timber harvest, rising domestic processing costs, and expensive and time consuming shipping logistics to export markets.”

In addition, LP faced hefty federal fines for pollution violations and product liability lawsuits. In Alaska, the corporation entered into agreements in 1995 with the U.S. Environmental Protection Agency (EPA) that called for up to \$30 million in expenditures to address pollution at its Ketchikan pulp mill and affiliated sites. Civil and criminal fines combined exceeded \$6 million (Draffan 1999). On top of the legal problems in the continental United States and Alaska, investments totaling \$200 million were needed to upgrade the pulp mill for competitiveness in world markets and to comply with federal requirements for pollution control, according to KPC estimates in 1996 (Alaska Office of the Governor 1997). By 1996, bankruptcy, sale, or merger loomed as possibilities for LP, and its KPC was in trouble.

The LP board recruited a new leader, Mark Suwyn, to overhaul the corporation. Suwyn closed sawmills and pulp mills that were not profitable, settled pollution disputes with the EPA, and refocused the product and marketing strategy of LP on the U.S. consumer and home-building markets (Nashville Business Journal 2004, Portland Oregonian 2004). In Southeast, Suwyn tested the community of Ketchikan, the USFS, and the political support for and opposed to the pulp mill. He asked the federal government to extend the pulp company’s timber contract and help finance the pulp mill upgrades. The proposals touched off advocacy and opposition, from Ketchikan to Washington, DC, and it became apparent that the federal assistance sought by LP and KPC was highly improbable.

Concurrently, the USFS was preparing the revision to the TLMP. The agency attempted to provide timber harvests to sustain existing mills while also incorporating wildlife conservation measures and protecting some of the places important for wildlife, fish, and subsistence (Swanston et al. 1996, Everest et

al. 1997). A final plan was approved in 1997 (USFS 1997).

In 1997, LP and subsidiary KPC negotiated a settlement with the federal government. The long-term timber contract of the parent corporation was cancelled, and KPC received “closeout” timber harvesting rights to 300 mmbf of Tongass old-growth forest. In addition, the federal government paid KPC and LP \$140 million to resolve all pending and threatened contract claims against the government. The following year LP announced the closure of the Ketchikan pulp mill (Alaska Office of the Governor 1997).

In Ketchikan, more than 500 workers lost their jobs (Alaska Department of Labor 2001). The closure affected logging jobs, which already were declining from the logging boom that accompanied the rapid liquidation of timber held by the Native village corporations. The dislocation and transition related to the KPC closure was more intense than those effects in Sitka. Although smaller sawmills still operated, the KPC closure significantly affected the entire community. An effort was made to start a veneer plant and small sawmill at the KPC mill site. In 1999, the Gateway Timber Corporation was launched with the closeout timber remaining from the pulp contract and federal funds passed through local government. The venture was unsuccessful, however. Gateway declared bankruptcy two years later and auctioned off most of the equipment (Alaska Journal of Commerce 2003).

In 1999, the USFS issued a new revision to the forest plan (TLMP) in response to appeals from many

interests. The changes further decreased the timberland base and protected additional lands. That decision was litigated by timber and environmental interests. Also in 1999, the Clinton administration advanced a national roadless regulation that called for all existing roadless lands in national forests to remain roadless. The rule was embraced by scientists and received substantial public support nationally and in Southeast. The timber industry strongly opposed the roadless rule, and timber interests and several states, including Alaska, objected in court.

In 2000, federal courts ordered the USFS to revert to the 1997 TLMP, but required a review of all undeveloped, roadless areas for their suitability for additional wilderness designations. When the administration changed in Washington, President George Bush appointed a former representative of the timber industry to oversee the USFS. The USFS completed the required wilderness study. Although about 85% of public comment in Alaska favored additional wilderness designations, none were recommended. Simultaneously, the Bush administration began a process leading to the reversal of the Clinton roadless rule.

By 2003, the Tongass plan (TLMP) was back to its 1997 version, with no pulp mills, no new wilderness recommendations, and no roadless area rule. Three major sawmills still operated, in Wrangell, Ketchikan, and Klawock on Prince of Wales Island. Smaller sawmills across the Prince of Wales Island road system and in Hoonah operated, with some local milling in virtually every community. The annual timber harvest

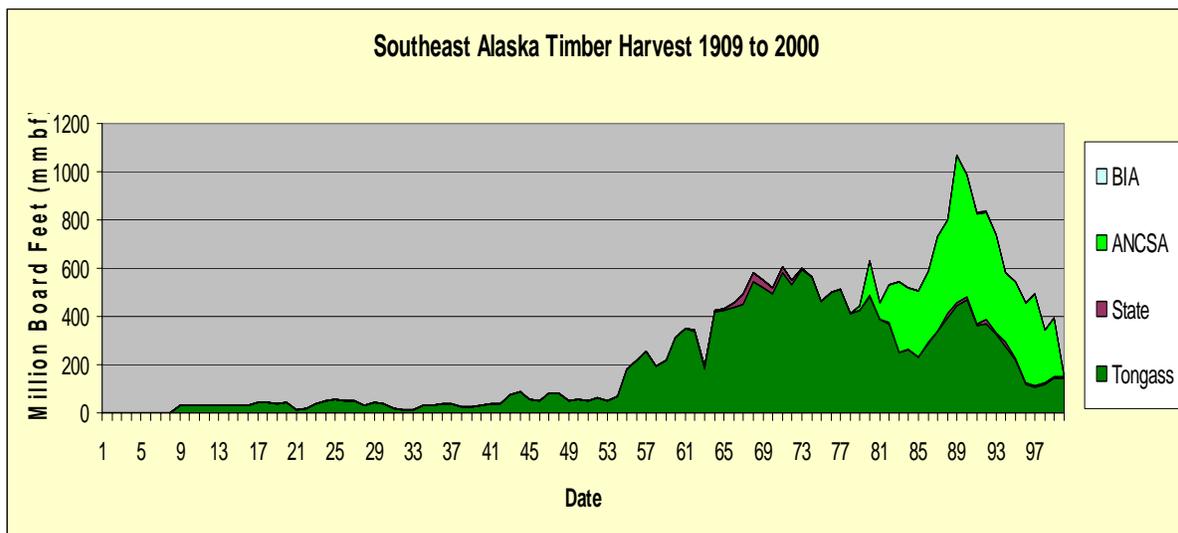


FIG 10. Southeast Alaska Timber Harvested (Sawlog plus utility volume) 1909–2000 (Alaska Department of Natural Resources 2002, Knap 1992, USFS 2003, 2004a). Years 1909 to 1951 by calendar year; Year 1952 average of fiscal and calendar years; Years 1953 to 2000 by fiscal year.

from the Tongass declined steadily from its record of 590.7 mmbf in 1973, to about 51 mmbf in 2003, an amount consistent with levels that preceded the pulp mills (Fig 10). Total Southeast regional harvest of timber peaked in 1989 at 991 mmbf, of which 420 mmbf was attributable to Native corporation harvests. The Native corporation harvests declined steadily after 1989.

SOUTHEAST ALASKA TIMBER TRANSITION

For the Southeast timber industry, the twentieth century ended with harvest levels and product lines similar to those that preceded the pulp mills. During the course of the last century, 25 billion board ft of timber were cut from the forests of Southeast. And that harvest came from the most valuable timber stands in the most productive areas of the forest. The vast majority of the harvested lands are currently stocked with young sapling and pole timber. Although substantial acreage of commercially valuable second-growth timber will not be available for harvest for another 30–60 years, some first-entry stands of second growth are beginning to provide a source of market-sized timber.

In Southeast today, perhaps half or more of the large-tree old growth in beach fringe, floodplain, and productive upland areas has already been harvested (Refer to Chapter 2 for more information). The vast majority of the timber harvest took place on land where loggers could use conventional methods, leaving future loggers with a higher proportion of rugged, less-accessible, and more-expensive areas to work. One legacy of this history is a timberland base that is even more heavily dominated by lower-value, higher-cost timber than when Bernard Fernow made his guarded and pessimistic assessment of the potential for industrial timber development in 1899.

On many Native corporation timberlands, the imbalance among stands logged is less significant, in large part because the corporations logged most of their overall timber base and were able to find export markets for their lower-value logs. However, it is important to recognize that Native corporations chose the most valuable timberlands in the Tongass during their land claim selections. Some of the lower-quality hemlock logs that cannot be manufactured profitably in Alaska will nonetheless bring a positive price if exported, unprocessed, to regions with lower manufacturing costs. The vast majority of the large-

tree (high-volume) stands have been cut on corporation lands, and nearly all will have been logged within a decade. The amount of timber harvest on private lands was estimated by the McDowell Group (2004) to be 210,000 acres (84,986 hectares) or more.

The increased scarcity of an already rare resource, large-tree old growth, accentuates resource tradeoffs among timber, fish and wildlife habitat, subsistence, tourism and recreation, and commercial fisheries. Because the same forest stands have multiple values, many of these valuable areas will become “pressure points.” Timber purchasers will continue to desire timber sales that are inexpensive to access and hold a preponderance of high-value timber stands—the same resource most necessary and desirable for the other uses listed above.

Before 1954, only a few scattered logging roads existed in Southeast. The Tongass now has more than 5,000 mi (8,000 km) of logging roads with new construction anticipated to exceed 50 mi (80 km) a year on average (USFS 2003). This incremental network of roads significantly increases challenges for fish and wildlife conservation (Titus and Beier 1991, Schoen et al. 1994, Person et al. 1996, Swanston et al. 1996, Flynn et al. 2004).

OUTLOOK FOR THE SOUTHEAST TIMBER INDUSTRY

The timber supply for the existing Southeast sawmills now comes from federal timber sales off the Tongass, logs purchased from ANCSA corporations, and occasional state or private land timber sales. The larger sawmills manufacture a variety of products, including dimensional lumber, shop lumber, custom lumber, and house logs. Smaller mills feature lumber milled for local sale and cedar shakes, and some specialize in high-value-added products such as musical instrument wood. A number of manufacturers are now drying their lumber to sell to higher-value markets. A new wood technology center in Ketchikan, a joint venture of the USFS and the University of Alaska among others, operates a wood testing and product development facility dedicated to increasing the market value and diversity of Alaska wood products.

Sawmill operators in Southeast continue to find local and export markets for higher-grade logs of all species: Sitka spruce, western hemlock, Alaska yellow cedar, and western red cedar. Shop lumber and specialty products can be recovered from many log

grades, and log export waivers are typically granted by the USFS for cedar logs and lower-grade hemlock logs. The USFS is also exploring micro-sized timber sales to better meet small community needs. In 2005, the USFS restructured the Point Couverden sale in response to small mill owners in the nearby communities of Gustavus and Hoonah. The original sale design called for a harvest of 25 million board feet from 760 acres (308 hectares). Small-scale operators could not afford to bid on such a sale. The USFS changed the sale to smaller units of 50,000 and 100,000 board feet sales and excluded logging in designated roadless areas at Point Couverden. In some respects, the sawmill industry of today is similar to the sawmill businesses that preceded and were nearly extinguished by the big pulp mills.

ANCSA Native corporations continue to export about 100 mmbf in unprocessed logs each year. Most of this volume is from land either owned or managed by Sealaska Corporation because the village corporations have liquidated nearly all of their timber.

Both the public and private sector have invested funds analyzing the potential for new plants that manufacture products from wood fiber, fiberboard, and ethanol, in particular. Such plants rely on economies of scale and significant factory investments, requiring both substantial capital and logging. The considerable obstacles to such investments are clear from the perspectives of the following recent economic assessments:

From Braden et al. (2000):

The wood products industry in Alaska has significant obstacles to overcome before it can become a prominent supplier of wood products. Challenges include: limited access to timber resources, higher production costs, geography and infrastructure that limit movement of materials within the state, dated equipment at most sawmills, limited transportation infrastructure, and expensive transportation to markets within Alaska and to the Continental US and Asia.

From Robertson and Brooks (2001):

Data consistently indicate that Southeast Alaska has been a high-cost producer of sawn-wood products operating at the margin of profitability over the assessment period [1986–94].

This is due to a combination of high labor costs on a per-unit-of-input basis and low productivity for labor inputs in both the logging and sawmill sectors, and for raw material inputs in the sawmill sector. ... Most of Southeast's timber inventory, however, is concentrated in lower valued species and log grades.

From Wiita (2001):

The industry must change its focus to marketing Alaska forest products as unique and creating niche markets that accommodate changing consumer needs and address increasing competition in both the foreign and domestic markets. It should promote Alaska products that support [a] smaller specialized industry and meet the demand for old-growth timber in the world market. The industry must adapt and respond to the needs of the market, the customer, the politician, and the environmental and tourism communities to create a new Alaska forest products industry. It is key for Alaska to develop this new industry rather than attempting to perpetuate an old industry that is becoming non-existent.

From Alaska Department of Labor (2003a):

Timber can be farmed, and vast forests exist in low wage countries. These abundant, alternative sources of supply have driven world prices of the commodity downward and glutted the market. While Alaska timber will continue to find specialty markets and niche opportunities, the economic realities of the early twenty-first century point towards a world market dominated by less expensive sources.

From McDowell Group (2004):

The combination of high costs for wood, labor, power, and other ingredients; distance from the lower 48; and especially competition from the many commodity wood products mills in the west coast of the US and western Canada make it highly unlikely that a

commodity wood industry could flourish in Alaska.

From Crone (2005):

Although timber from the Tongass continues to play a role and efforts to assist the wood products industry restructure should continue, timber is not likely to be the most important contributor to future socioeconomic well-being in the area. Based on regional, national, and international economic and demographic trends, the roles the Tongass plays as a provider of tourism and recreation opportunities and as the custodian of many of the unique natural amenities and ecosystem values that both attract tourists and enhance the quality of life for existing and potential residents, is likely to be of more importance to the economic vitality of the region.

TRANSITION FROM TIMBER ECONOMY TO FOREST ECONOMY

Economists for decades have described the Alaska timber industry as a high-cost supplier, remote from markets. Road-building, logging, and manufacturing costs are all higher in Southeast than almost anywhere else in the world where timber is produced. The valuable trees are those that loggers have always targeted: select spruce, red cedar, and Alaska yellow-cedar.

There is little likelihood that fiber-based products made in Alaska could compete successfully with those from fast-growing trees in low-cost supply regions. Fiber-based products such as pulp or fiberboard can be made from a wide range of raw materials, from kanaf (an East Indies fiber plant) to plantation-grown pine or eucalyptus farmed throughout the world. Fiber plants, which initially were justified as a way to supplement sawmills by utilizing low-grade logs and cull material, have tended to dominate the industry and timber program.

Recent analysis by USFS economists strongly suggests that efforts to further develop the Southeast economy based on timber cannot succeed on an economic basis, and does not need to do so (Crone 2002, Crone and Robertson 2004, Tsournos and Haynes 2004). Unlike the 1950s, when the salmon industry was in crisis and timber development looked

like a source of salvation, the regional economy of today is more diversified and more complex, and has an array of possibilities to consider.

In the resource arena, salmon are abundant and prices may be on the rebound with increased prices for high-value products and new product and market ventures for the higher-volume species. Many fisheries are robust, particularly ground fish. Recreational fishing is almost certain to continue its rapid growth in popularity, drawing additional visitors to the region. Mining has a role in the region, notably today in the Kennecott Greens Creek metal mine. Because the large mines today are capital intensive and sensitive to both costs and metal prices, it is difficult to predict when and where new mines will open.

Tourism continues to grow strongly. Cruise ship tourism is the mainstay, but independent travelers and seasonal residents represent potential growth areas in the visitor industry. Government employment and spending have declined, but institutional services such as health care continue to grow and provide full-time and part-time jobs. Improvements to the electric power and transportation infrastructure are under way and will benefit all businesses. And, much of the economic growth and potential growth in the region is within the service sector, which can be fueled by any of the endeavors noted previously (Crone 2002, Crone and Robertson 2004).

Restoration of fish and wildlife habitats is another potential source of economic benefit. With hundreds of thousands of acres of second growth in stem exclusion stage and numerous streams, rivers, and karst drainage features impaired by past logging practices and associated road-building, there are significant business opportunities in restoration and stewardship. For example, a number of old logging roads are unnecessary for future public purposes but need to be decommissioned properly to minimize erosion damage to soils and salmon streams. Stream crossings need to be removed or improved to ensure they do not block salmon passage. The Alaska Department of Fish and Game reported that 1/3 to 2/3 of stream crossings in Southeast needed remedial work to ensure fish passage (Flanders and Cariello 2000). Such work often requires significant labor and earth-moving equipment. The USFS estimates for every \$1.5 million invested in such stream restoration activities, ten good-paying jobs are created. Furthermore, commercial, sport and subsistence users of salmon reap the benefits of thriving wild salmon runs. In general, restoration and

stewardship activities, and marketable byproducts of these activities, could be important dimensions of a diverse forest economy in Southeast.

Concerning regional development, the conversations have been centered on the concept of a resource-based economy, in which “forest” was equated with “timber” and “sustained yield” meant maximizing one material resource at a time. Opportunity exists in shifting economic development consideration to a more complex and diverse regional economy based on the forest ecosystem and responsive to real-world market forces and economic trends. Consideration of the “forest ecosystem” rather than “timber” expands the economic and social opportunities to all resources, uses, and values, and the business opportunities in these diverse ecosystem values. This approach opens up new possibilities for economic development, as well as new ideas about sustainability and community prosperity.

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