ALASKA LEGISLATURE COMMITTEE FILES 1985-1986 8672

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Preface

Management of the Nation's National Forests has been shaped by a variety of laws and regulations. Perhaps the most instrumental of these in the past 15 years has been the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) and the National Forest Management Act of 1976 (NFMA). The two acts established specific procedures and guidelines for assessing the Nation's forest and rangeland resources and for incorporating land management planning in meeting multiple resource use and protection goals.

In Alaska, forest management has been further refined by the Alaska National Interest Lands Conservation Act of 1980 (ANILCA). This Act was a comprehensive Congressional treatment of Alaska land issues related to land claim disputes and management of Federal areas. Many of these issues were carry-overs from earlier legislation, primarily Section 17(d-2) of the Alaska Native Claims Settlement Act, and required resolution before State and Native Corporation land selections could be completed. These land selections were authorized in the Alaska Statehood Act (1959) and the Native Claims Settlement Act (1971).

An important source document for the Southeast Alaska portion of the deliberations leading to ANILCA's passage was the Tongass National Forest Land Management Plan (Forest Plan) completed in 1979. Because of the close relationship between the Forest Plan and ANILCA, much of the reporting and monitoring efforts required under both have proceeded in a parallel fashion. In fact, much of the information contained in this report draws from earlier forest planning documents and ANILCA reports. For example, the major factors influencing timber supply and demand in Southeast Alaska are described in annual timber supply and demand reports called for by Section 706(a) of ANILCA. A report on "Opportunities to Increase Timber Yields from National Forest Timber in Alaska" was called for by Section 705(c) of ANILCA. Subsistence management and use provisions implementing Title VIII of ANILCA are highlighted in a report called for by ANILCA Section 813. More recently, the Tongass Land Management Plan Evaluation Report (1984) described changes in management since the Forest Plan was implemented and how the Forest Plan has influenced activities on the Tongass National Forest. The Evaluation Report also identifies "mid-course" corrections needed to make the Forest Plan more responsive to current management conditions. Changes to the current Forest Plan are made through periodic amendments beginning with the one in 1985.

This is the first in a series of ANILCA reports to Congress on the status of the Tongass National Forest called for by Section 706(b). Information contained in this and other reports as well as the Forest Plan amendments will be used in scheduled revisions of the Tongass National Forest Plan. The first revision is currently scheduled to be completed in 1989.

Executive Summary

Status of the Tongass National Forest, Southeast Alaska

The total land area for the Tongass National Forest is approximately 16.7 million acres. Under the current Tongass Land Management Plan, 41 percent of the total land base is available for timber management, 33 percent is designated Wilderness and the remaining 26 percent is managed in an unroaded condition. Table 1 displays the amount of forested land in each of the above categories, the amount classified as commercial forest lands, the amount suitable for timber harvest, and the amount programmed for timber harvest. Eleven percent of the total land base is programmed for timber harvest during the first rotation, or 100–120 years.

Table 1 — *Tongass National Forest land base, Southeast Alaska*

	Total area (millions of acres)	Forested lands (%)	Commercial forest lands (%)	Suitable for harvest (%)	Programmed for harvest (%)
Available for timber management	6.9	80	52	29	25
Wilderness	5.5	48	29	16	0
Managed in an unroaded condition	4.3	25	15	8	0
Forest total	16.7	57	35	18	11

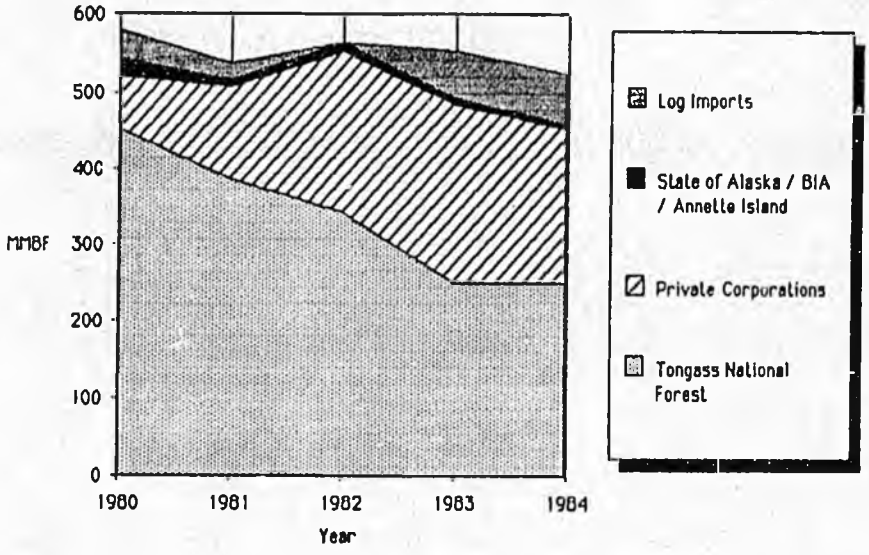
Timber Harvest Levels

The overall timber harvest from all ownerships in Southeast Alaska has remained relatively constant since the passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. However, new suppliers of timber have appeared during this period. The increase in the amount of timber supplied by private landowners has almost tripled as Southeast Alaska's Native corporations have received title to the lands selected under the provisions of the Alaska Native Claims Settlement Act of 1971. These private landowners have been able to export unprocessed logs; in contrast to purchasers of Tongass National Forest timber who are required to complete some form of primary manufacture prior to exporting. The lack of primary manufacturing requirements, the presence of more environmental protection on National Forest timber sales, and a preference for round logs by many buyers in the Pacific Rim countries, have contributed to increased timber being purchased from private ownerships in Southeast Alaska. Figure 1 displays timber harvest levels from 1980 to 1984 on Forest Service, State of Alaska, and privately managed lands. Also displayed is the amount of log imports from British Columbia for the same period.

The amount of timber harvested on the Tongass National Forest has substantially decreased since the enactment of ANILCA. Several factors in addition to the increased private timber harvests are responsible for this decrease. These factors include a poor market for Alaska's lumber products and dissolving pulp; the substitution of low-quality logs from British Columbia for Southeast Alaska pulp logs; and the value of products after primary manufacturing compared to round log exports from private lands in Alaska. The dominating factors are

Figure 1

Timber Harvests in Southeast Alaska, 1980–84



the lower overall demand for Alaska's manufactured wood products and the higher costs of manufactured wood products in Alaska.

The economic condition in the Pacific Rim, which some have described as the worst since the 1930's, has severely affected the profitability of National Forest timber sales. Both the timber industry and the Forest Service have instituted cost-saving measures which have provided significant savings in the harvesting and manufacture of Alaska's wood products. However, the composite value of wood products made from Tongass National Forest timber in Southeast Alaska has dropped nearly $200 per thousand board feet (mbf) since 1980. The result is that the cost savings being realized are not offsetting the drop in end-product values. For this reason many sales remain unsold.

Another result of the depressed markets is the delayed realization of benefits from added investments envisioned in the Forest Plan and provided by ANILCA. The Forest Plan anticipated that harvest of lower volume and more expensive stands would be necessary in order to offer 4.5 billion board feet per decade. This was due to several factors including the designation of Wilderness, the establishment of areas to be managed in an unroaded state, and the need to protect other resource values. Investments in road construction prior to the sale of timber (preroading) and advanced logging technology were intended to offset the increased cost of harvesting these stands. Precommercial thinning is also needed if the 4.5 billion board feet per decade timber supply is to be made available. While precommercial thinning investments have been carried out as planned, the industry has shown little interest in the marginal timber stands made available. Consequently, with some exceptions, the benefits of the investments in these areas will not be realized until these areas are needed to meet market demands.

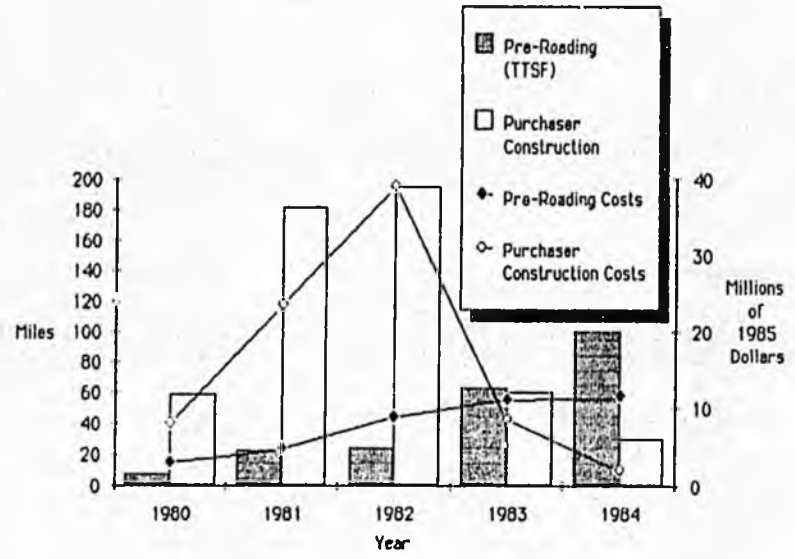
Recognizing the impact these economic conditions have had on the programs envisioned in the Forest Plan and ANILCA, the Forest Service has attempted to be flexible in its administration of these investments. For example, the scheduling of public works construction of roads used in the timber program has been modified to decrease the time between preroading construction and actual timber harvest. Also the timber sales being offered are being designed to improve the economics of the sale from both the timber purchasers and the American taxpayer's perspective.

The Forest Service has begun scheduling public works road construction on selected short-term timber sales after the sales are sold rather than prior to sale offerings, in order to insure Federal expenditures are used where timber harvest will actually occur in the near future.

Further, timber purchasers are being reimbursed for part of the costs associated with the construction of certain roads on the National Forest in those stands that are of lower

Figure 2

Timber Road Funds and Miles of Construction Contracts Awarded, Tongass National Forest, FY 1980–84



average quality or with more difficult access than those assumed in the Forest Plan.

Figure 2 compares the dollars spent and the miles of roads built by the Forest Service (preroading) versus that constructed by timber purchasers through credits; that is, credit against the amount owed to the Federal Government for the timber.

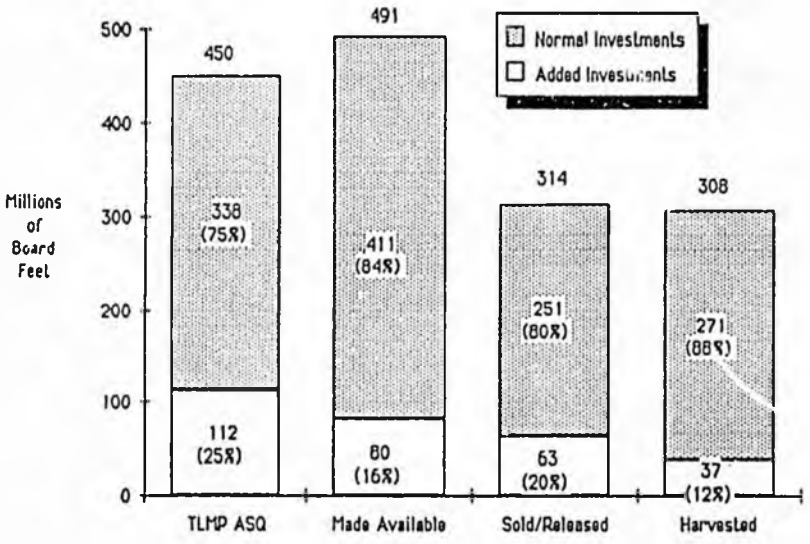
Added investments to encourage advanced logging technology have been reduced until timber demand increases to near pre-ANILCA levels. This was done because timber stands requiring this advanced logging technology are more expensive to harvest and generally have less valuable timber. Until demand for timber increases, thereby making these marginal stands more attractive, it is felt that this type of investment would serve little purpose.

Precommercial thinning investments have met the expectations envisioned in ANILCA. The precommercial thinning program has increased the efficiency of producing timber on the existing land base.

Figure 3 compares the timber volume attributed to normal and added investments in the Forest Plan (1978), with the timber volumes made available, sold, and harvested since 1980.

Figure 3

Average Annual Timber Volume Attributed to Normal and Added Investments in the Forest Plan Versus the Volumes Made Available, Sold, and Harvested, 1980–84



Impact of Wilderness

The Southeast Alaska economy is dependent on natural resources supporting the timber, fisheries, and tourism industries, as well as government expenditures. Figures 4 and 5 show the relative importance of these economic sectors in terms of employment and earnings. Note that employment is expressed in average annual jobs, not full-time equivalents (FTE's).

Over the long term, a result of including commercial forest lands in Wilderness (hence unavailable for harvest), will increase the use of lower-quality timber and the need to use areas requiring advanced harvest technology. The timber supply goal of 4.5 billion board feet

Figure 4

Average Annual Number of Jobs (Not Full-Time Equivalents), Southeast Alaska, 1977–84

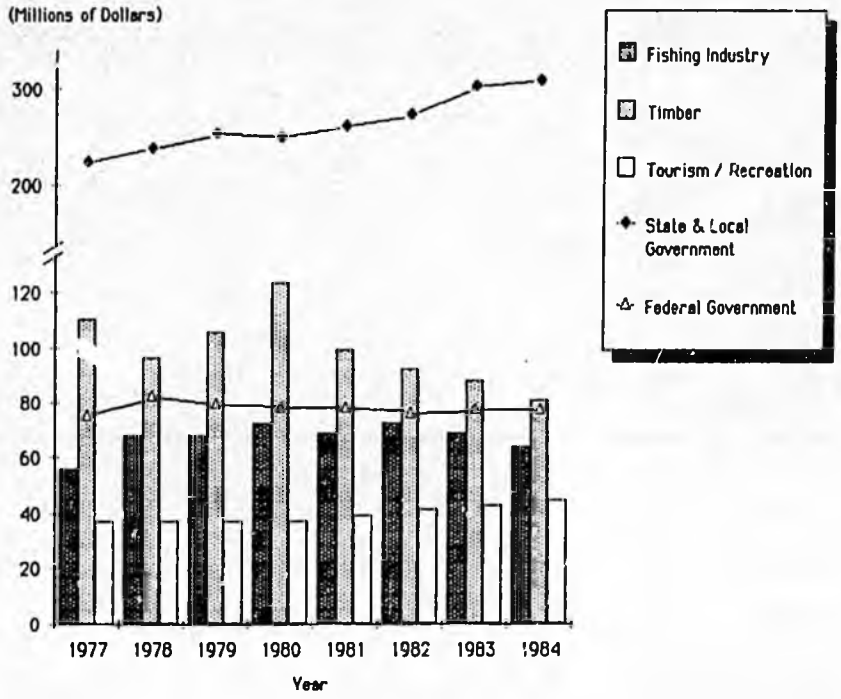
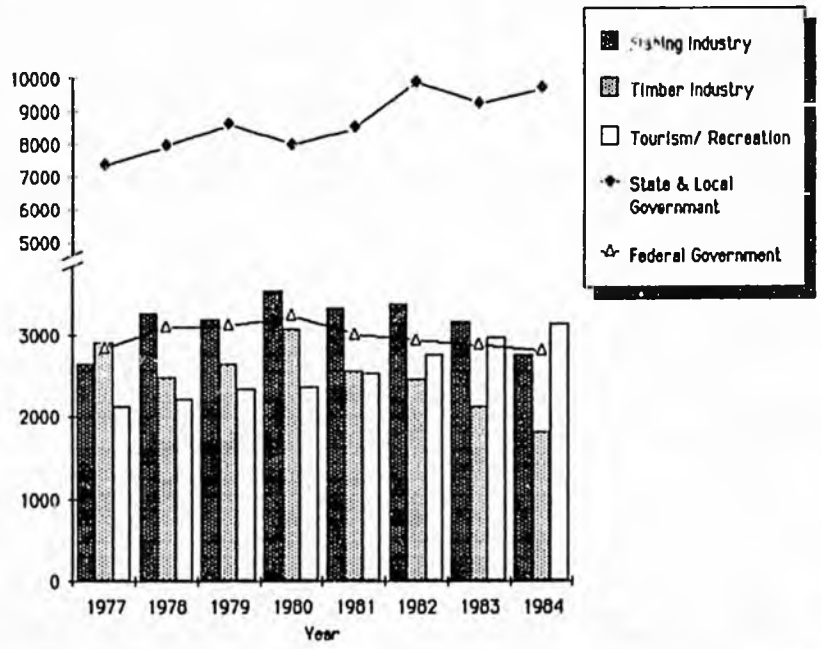


Figure 5

Direct Earnings, Southeast Alaska, 1977–84



per decade cannot be achieved without using this lower-value, more expensive timber. If commercial forest lands were not in Wilderness, there would be less need for low-volume timber stands and areas requiring advanced logging technology over the harvest rotation, 100–120 years. Because of reduced market demands since 1980, there has been little need to harvest the marginal areas identified in the Forest Plan which require higher logging and transportation costs.

The impacts of Wilderness on the fisheries industry are neutral to positive. ANILCA provided for the management and enhancement of fisheries habitat in Wilderness areas, including aquaculture projects. This provision is unique to Alaska and provides the opportunity to manage the fisheries resource in both the Wilderness and non-Wilderness areas of the Forest. Comprehensive fisheries management in Wilderness areas will continue under the joint direction of State and Federal agencies. Wilderness will continue to provide opportunities for research and management of existing stocks of fish under natural conditions.

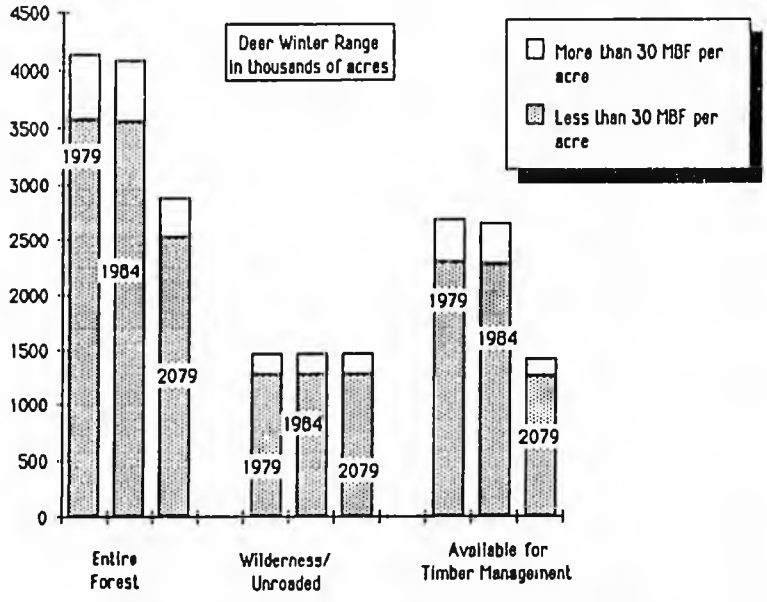
The impact of Wilderness on the tourism industry is mixed, but generally favorable. The tourism industry is primarily based on Alaska's undeveloped scenic character both within designated Wilderness and in other areas with relatively undeveloped characteristics. The State of Alaska and the tourism industry have used these characteristics successfully in advertising campaigns to bring out-of-state tourists to Alaska. The majority of tourism operators feel Wilderness is a positive attribute, but also recognize the restricted effects Wilderness designation has on facilities such as lodges and resorts.

Measures Instituted to Protect Fish and Wildlife

Protecting and managing fish and wildlife habitats on the Tongass National Forest remains a high priority and a public issue. Forty percent of the areas having high wildlife value and 50 percent of the areas having high commercial and recreational fish values have been placed in Wilderness or in unroaded areas managed primarily for primitive recreation. In addition, 273,000 acres of commercial forest lands in areas available for timber harvest have been set aside for wildlife and fisheries purposes. While originally intended to maintain the visual quality of an area, extended timber harvest rotations (120 to 200 years versus 100 years) on an additional 244,000 acres of commercial forest lands, will also benefit fish and wildlife habitat. With these measures, the Forest Service estimates that 69 percent of 4,146,000 acres of deer winter habitat identified in the Forest Plan on the Tongass will remain at the end of the timber harvest rotation. Figure 6 displays the distribution of old-growth deer winter range on the

Figure 6

Distribution of Old-Growth Deer Winter Range, Tongass National Forest, 1979, 1984, and Projected to 2079



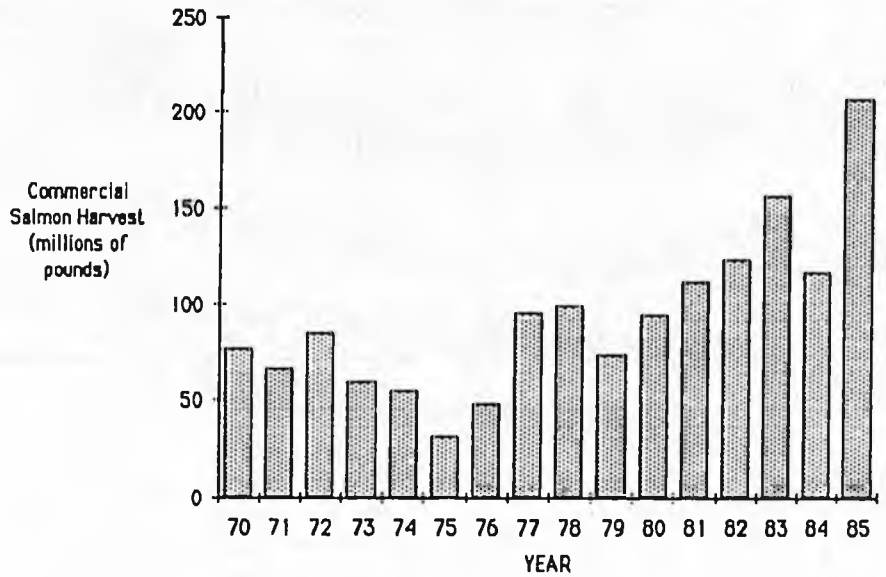
Tongass now and at the end of the first planned timber harvest rotation, the year 2079.

Studies to improve habitat in second-growth areas, which have the potential of reducing the impacts of old-growth habitat loss while at the same time increasing wood production, continue. Measurement of public demand for fish and wildlife use, including subsistence, will also be continued.

Fisheries management and enhancement projects on the Forest have contributed to increases in salmon stocks since the late 1970's. Cooperative fisheries management with other Federal and State agencies will continue until the optimum sustained yield for fisheries is reached. Habitat management and enhancement projects will continue to include projects in Wilderness areas as provided in ANILCA. Figure 7 shows the trend in commercial salmon harvests from 1970 to 1985.

Figure 7

Commercial Salmon Harvests, Southeast Alaska, 1970–85



Status of the SBA Timber Program

The SBA Set-Aside Timber Sale Program was started in 1977 and has increased the amount of National Forest timber sold to qualifying small businesses. However, the poor timber markets since 1980 which have resulted in an increased number of timber sale offerings having reduced opportunities for profit; and, the greater competition (specifically from Alaska's private log exporters and lumber suppliers in British Columbia), have all combined to severely depress the harvesting and sawmill operations of small businesses. Two of six small business mills are currently in bankruptcy and the remaining four are operating on an intermittent basis.

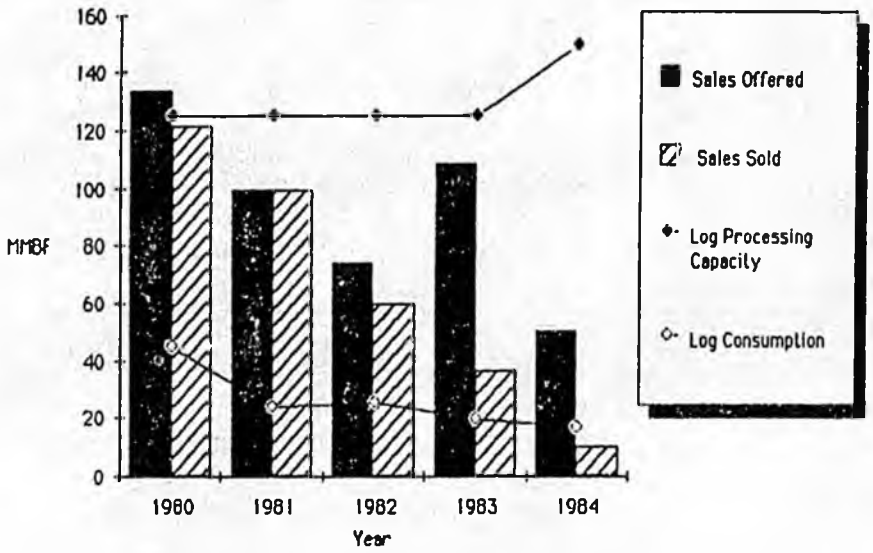
The SBA set-aside program is important to small businesses in their bid to secure National Forest timber. The Federal Timber Contract Payment Modification Act of 1984 will help small businesses remain competitive with the two pulp companies holding long-term National Forest timber sales. However, improvement of existing markets or development of new markets is important to the maintenance of existing industry. Figure 8 shows the amount of Tongass National Forest timber made available and sold in the SBA program from 1980 to 1984.

Community Stability and Timber Economics of the Tongass National Forest

Primary processing of National Forest timber and the establishment of long-term timber sale contracts were two methods used to stabilize the timber industry and diversify the economy of Southeast Alaska. To a large extent, these efforts have been successful. Between 1954 and

Figure 8

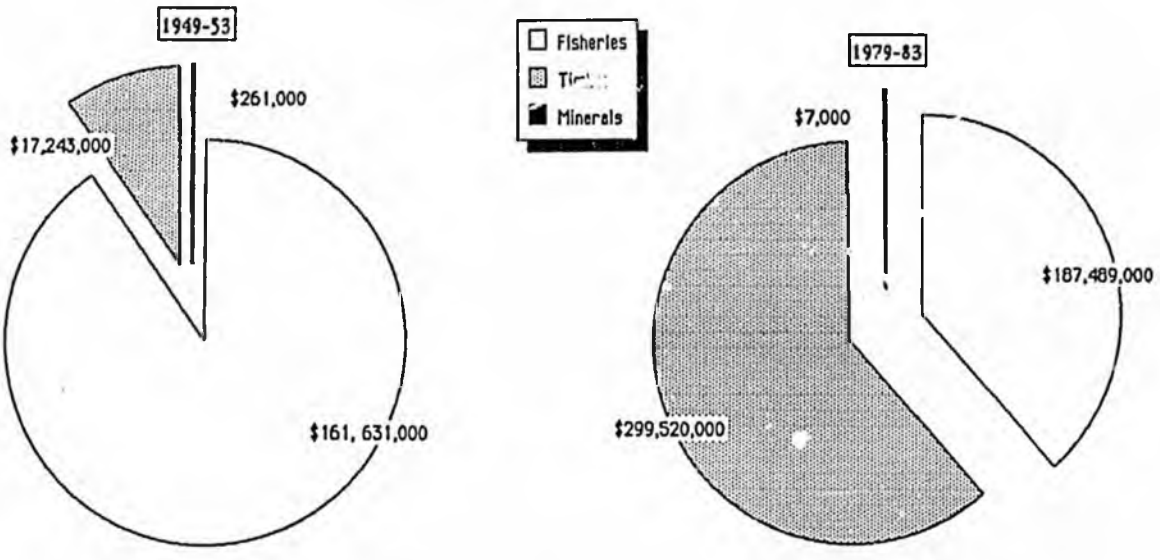
SBA Timber Made Available and Sold to Small Sawmill Owners, Tongass National Forest, 1980–84



1974, timber industry employment grew from 29 to 54 percent of the total employment in natural resource industries in Southeast Alaska (fisheries, timber, minerals). Since 1980, however, depressed timber markets for N tional Forest timber have altered this trend, and timber now accounts for approximately 40 p rcent of the region's employment in natural resource industries. Figure 9 shows the significance of the timber industry in the natural resource economic sectors of Southeast Alaska, during the periods 1949–53 and 1979–83. The heavy reliance on export markets for Alaskan wood products means that the industry is heavily influenced by timber market trends within Pacific Rim countries. Figure 10 shows the estimated cumulative costs and returns of the Tongass National Forest timber program over the next 50 years under two market demands, weak (current) and strong. Each of the schedules displayed in figure 10 achieves a timber supply of 4.5 billion board foot per decade and is consistent with the multiple

Figure 9

Value of Timber, Fisheries, and Minerals, 1949–53 and 1979–83



resource direction in the Forest Plan. The calculated returns do not include dollar benefits or costs for nontimber resources such as wildlife, fisheries, and recreation, nor other indirect benefits associated with transportation systems and other infrastructure.

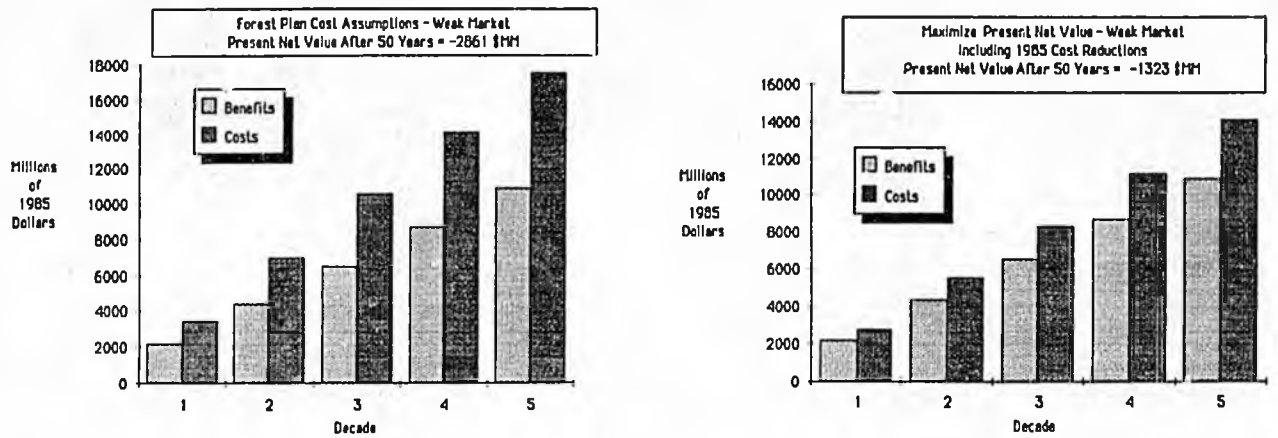
Ways to improve the economics of timber production in Alaska include different product mixes, instituting cost reduction methods and assessing the long-term means of providing the most cost-effective access to timber stands. For example, a alternative product mix favoring the production of more dimension lumber could increase the net benefits by 11 percent.

The timber industry in Southeast Alaska needs to be aware of the changing demands in the world market and make any needed adjustments in the products delivered to those

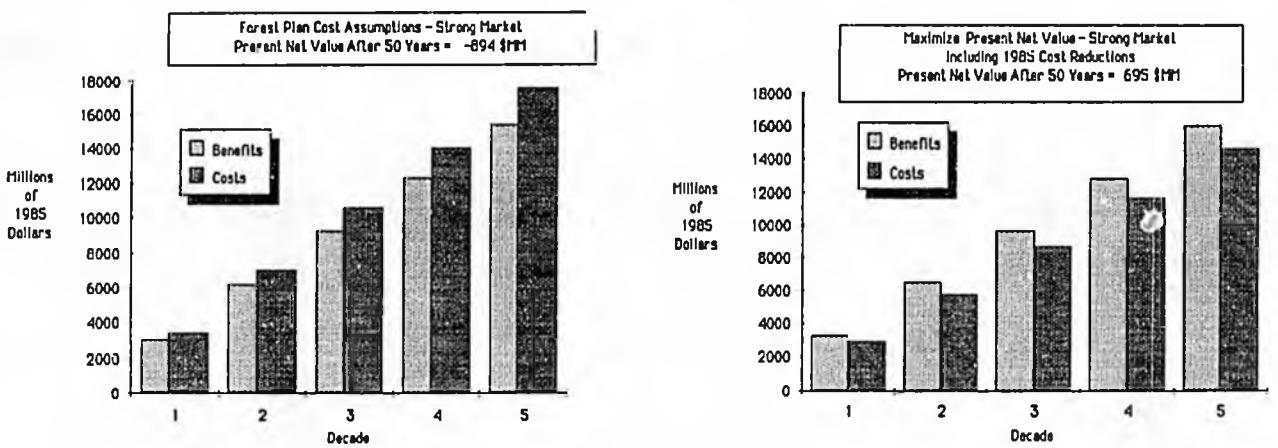
Figure 10

Cumulative Cost and Returns of Two Harvest Schedules Under Weak and Strong Markets

"Weak" or Current Market



"Strong Market"



markets. The type of pulp products that have been the mainstay of the industry, are no longer in demand at the levels of the late 1970's. Large stands of high-quality timber for use as dimensional lumber, are becoming more expensive to access. Increased dependence upon lower-quality wood can be expected. Higher production costs and lower-quality timber work against the industry in remaining cost competitive with other North American timber suppliers. The industry needs to continue to seek out better means of meeting world demands.

Subsistence Management and Use

Subsistence, as defined by ANILCA, provides a priority status for customary and traditional consumptive uses of fish, wildlife, and other renewable resources by rural Alaska residents on Federal public lands. Subsistence management does not preclude the use of other resources but requires the Forest Service to consider subsistence uses in making resources decisions. There have been no findings of significant restrictions on subsistence use from the Section 810 evaluations prepared on Forest Service projects.

Cooperators' Views

Section 706(c) of ANILCA calls for the Forest Service to work in cooperation and consultation with groups named in the section. This chapter provides the unaltered views of the cooperators. The Forest Service received comments on the draft report from the cooperators listed in Section 706(c), as well as other interested groups and individuals, and has responded to or made changes in this final report.

Contents

Introduction

The Tongass National Forest is the largest National Forest in the National Forest System, extending over more than 16.8 million acres or nearly 85 percent of Southeast Alaska. Glaciers, volcanic processes and a cool maritime climate yielding some 100 inches of precipitation annually have sculptured the "Alaska Panhandle." Today, Southeast Alaska is characterized by hundreds of large and small islands, rugged coastlines, tidewater glaciers, an intricate system of fiords and waterways, high mountains, vast spruce and hemlock forests, and countless rivers and streams. Fish and wildlife resources are varied and plentiful. Some of the more commonly known species include Sitka black-tailed deer, brown and black bears, bald eagles, wolves, moose, mountain goats, and five species of Pacific salmon.

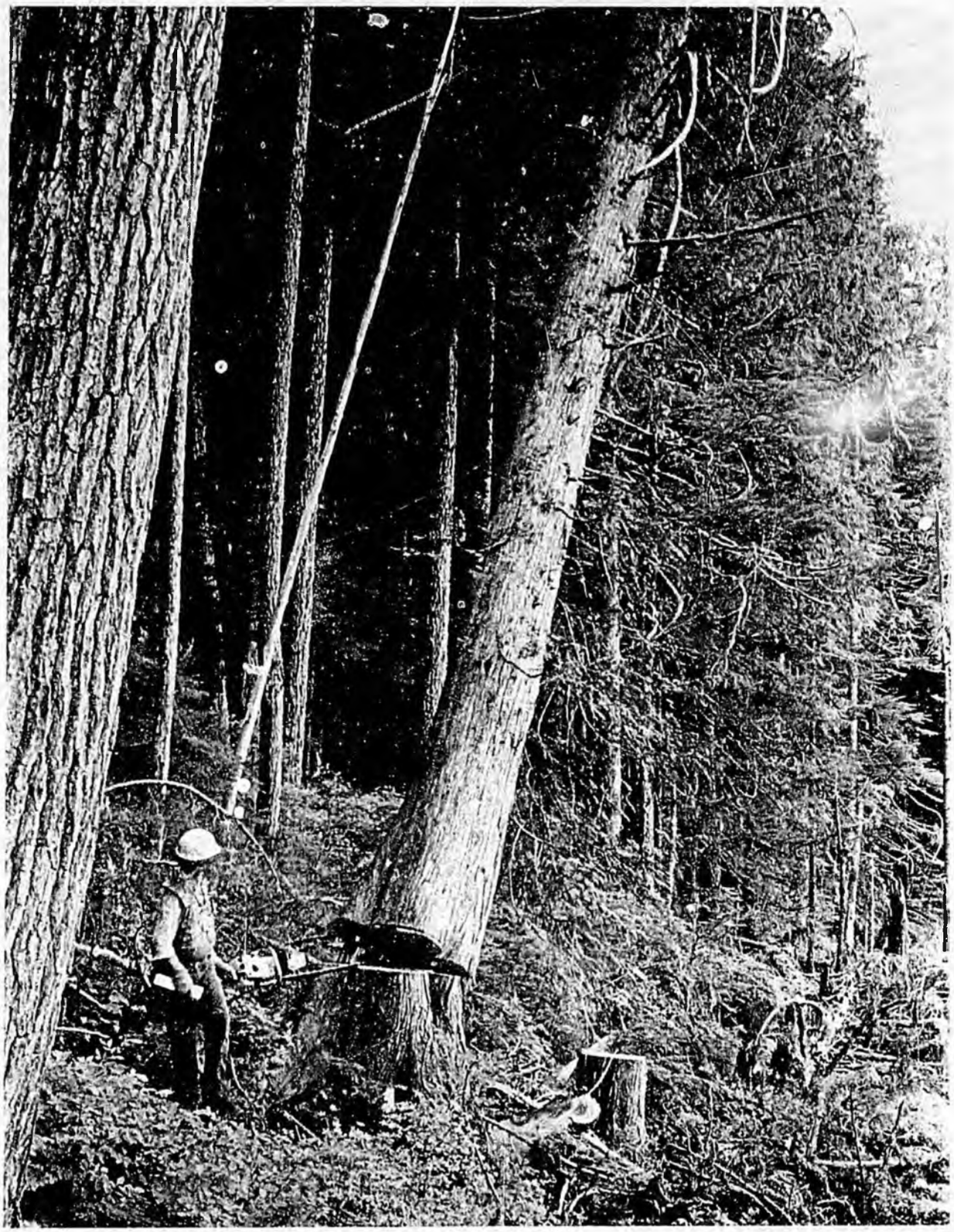
It is within this setting that human occupation of Southeast Alaska and use of the Tongass National Forest has evolved. From the region's earliest settlement by Tlingit and Haida Indians, use of the area's natural resources has been the primary focus of human activity. Today, timber, fishing, mineral exploration and development, tourism, recreation, and subsistence are the major activities which rely on Southeast Alaska's and, thus, the Forest's resources.

Unfortunately, not all of these activities are viewed as compatible. Congress recognized these potential resource conflicts when it passed the Alaska National Interest Lands Conservation Act (ANILCA). In a broad sense the Act attempted to balance many of the competing demands being placed on Alaska's natural resources. While the Act addresses land and resource use issues throughout the State, several important provisions directly influence management activities in Southeast Alaska and the Tongass National Forest in particular. Specifically, Section 703 created 5.5 million acres of National Monument and Wilderness Areas within the Tongass National Forest; Section 705 authorized a funding mechanism to maintain a supply of National Forest timber to the dependent industry at a rate of 4.5 billion board feet (bbf) per decade; and Section 706 established a Congressional reporting process to monitor timber supply and demand conditions in Southeast Alaska and management of the Tongass National Forest.

Under Section 706(b) of ANILCA, the Secretary of Agriculture is to report to Congress in 1985 and every two years thereafter on the status of the Tongass National Forest.

> The report will include, but not be limited to, (1) the timber harvest levels in the Forest since the enactment of the Act; (2) the impact of Wilderness designation on the timber, fishing, and tourism industry in Southeast Alaska; (3) measures instituted by the Forest Service to protect fish and wildlife in the Forest; and (4) the status of the small business set-aside program in the Tongass National Forest.

This is the first ANILCA report on the status of the Tongass National Forest, commonly termed the 706(b) Report. It provides information on management activities on the Tongass since the passage of ANILCA in 1980, and how these activities have impacted resource-dependent industries and users in Southeast Alaska. The report is divided into seven chapters based on the topics identified in the Act and requested additions from cooperators to the study.



Logging continues to be an important part of Southeast Alaska's economy.

Chapter 1

Timber Harvest Levels in the Tongass National Forest Since ANILCA

This chapter examines the timber program on the Tongass National Forest since ANILCA, and the factors, both market and institutional, which have affected timber harvest. Harvest of timber from Forest Service, State, and private lands is summarized for the period 1980 to 1984. State and Native land selections and the creation of Wilderness in ANILCA introduced substantial changes to the land base available for timber harvest on the Tongass. The effects of these changes are analyzed in terms of timber supply availability from the Forest. The amount of timber offered for sale, sold and harvested from the Tongass since 1980 is compared to that originally scheduled in the Forest Plan. The contribution of investments in intensive management practices and preroading by the Forest Service in achieving the Forest Plan timber sale schedule is described. The overall role of preroading and intensive management on the Forest is highlighted. The status of the ANILCA Loan Program to promote special harvest technology is summarized. Finally, an explanation of current timber sale and roading policies is provided.

Congress, through the passage of ANILCA, balanced wilderness demand and timber supply on the Tongass National Forest. Various national and local publics desired preservation of specific areas through Wilderness designation. Others desired a timber supply which would maintain employment and associated economic conditions in Southeast Alaska at near 1970–76 levels. The resulting legislation designated over 5.4 million acres as Wilderness, and provided a funding process to maintain a timber supply of 4.5 billion board feet (bbf) per decade from the available timber-producing land base. Congress recognized that to sustain this supply, intensive management of the land remaining available for timber harvest would be required. ANILCA authorized the establishment of a permanent appropriation to be drawn from Federal receipts from oil, gas, timber, coal, and other natural resources to fund the Tongass timber program. This appropriation, called the Tongass Timber Supply Fund (TTSF), provided for intensive timber management practices and investments in Government preroading of areas prior to the sale of timber. ANILCA Section 705(a) provides that:

> . . . the Secretary of the Treasury shall make available to the Secretary of Agriculture the sum of at least $40,000,000 annually or as much as the Secretary of Agriculture finds is necessary to maintain the timber supply from the Tongass National Forest to dependent industry at a rate of four billion five hundred million board foot measure per decade.

This chapter of the report describes the Tongass timber program since 1980. Included are:

1. A display of the volume of timber harvested and brought to market since ANILCA from State, Native, and Federal ownerships in Southeast Alaska.
2. An assessment of the effect of land status or ownership changes since the enactment of ANILCA on the Tongass National Forest's capability to maintain a timber supply of 4.5 bbf per decade.
3. An evaluation of the effectiveness of the Tongass Timber Supply Fund in maintaining the timber supply from the Tongass National Forest.
4. The present status of the Timber Utilization Loan Program.
5. A clarification of the current timber sale policies on the Tongass National Forest.

SOUTHEAST ALASKA TIMBER HARVEST

The Pacific Rim countries (primarily Japan, but with increasing interest from Taiwan, South Korea, and the Peoples Republic of China) are the primary purchasers of Southeast Alaska timber products. The stability and growth of the industry therefore is dependent upon the ability of the industry to meet the needs of these countries at a reasonable cost. A

variety of factors have influenced how well the industry has been able to meet these needs from timber harvested from the Tongass National Forest.

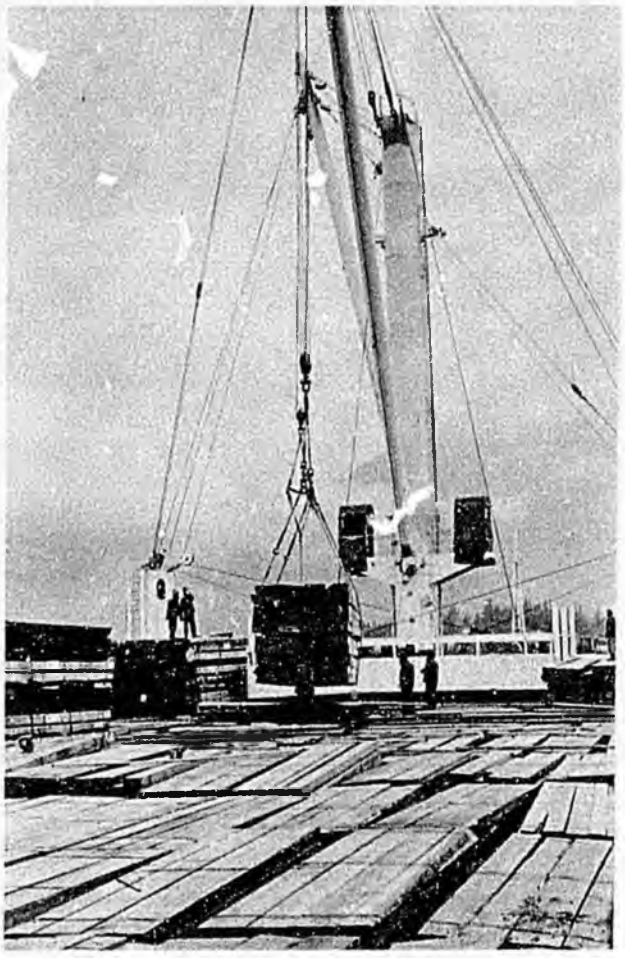
These factors include increased product competition from private corporations for the same market, changing market demand for products produced from National Forest timber, and the availability of cheaper timber from sources other than National Forest lands. These factors taken alone or in combination mean lower profits from National Forest timber, which in turn result in decreased harvests. It is not surprising, then, that since enactment of ANILCA, timber harvests from the Tongass National Forest have steadily declined.

Specific examples of how these factors have affected harvests on the Tongass National Forest may prove useful.

Timber harvested on Federal lands is required to receive at least minimum primary manufacture prior to export. This minimum primary manufacture, which is mandated by Federal regulation, is the processing of logs into cants and waneys (semiprocessed, rough sawn logs having at least two sides sawn and less than 8 3/4 inches thick). Unprocessed logs, sometimes called "round logs," have been preferred in the Pacific Rim countries to the wood products manufactured from National Forest timber. This preference is primarily due to cost differences in some grades of logs, the ability to utilize the entire log, and the employment provided in timber processing within the importing country.

In contrast, timber harvested from Southeast Alaska's private lands is not subject to the primary manufacturing requirements and is commonly exported as unprocessed logs. Private timber harvests in Southeast Alaska have steadily increased since 1979. This increase, however, cannot be attributable directly to ANILCA for it was not until the late 1970's that the private landowners began to receive title to significant portions of the lands conveyed to them under the provisions of the Alaska Native Claims Settlement Act of 1971.

Another example of how Tongass National Forest harvest levels have been affected by market conditions is the decline in the demand for dissolving pulp. Because much of the timber in Southeast Alaska, both public and private, is of a quality not suitable for dimension lumber, it is unsatisfactory for export as logs or cants. If harvested, this timber is usually processed into dissolving pulp or woodchips. Woodchips are used to make paper and/or dissolving pulp. Dissolving pulp is manufactured into rayon, cellophane, certain photographic films, and some dietary products. Since passage of ANILCA, demand for these products has steadily declined. This decline can be attributed to increased competition from newer



Cants that are processed in Southeast Alaska mills, are loaded on a freighter destined for a Pacific Rim country.

pulpmills as well as changing demands for products made from dissolving pulp.

The third factor is that other Southeast Alaska suppliers of wood products are not required to meet standards resulting from various Federal laws and regulations. These regulations include utilization standards for small-volume logs, limitations on the size of harvest areas, and construction specifications for roads. Compared to the late 1970's, relatively the same total volume of timber is now being harvested from lands under a variety of ownerships. The increased costs incurred by operators harvesting National Forest timber to meet Forest Service timber sale contract requirements puts them at a competitive disadvantage relative to other suppliers of Pacific Rim markets.

An associated impact has been the recent importation of pulp logs from Canada. Southeast Alaska processors find it less expensive to purchase Canadian logs for use in their pulpmills than National Forest timber. The result has been less timber harvested from the Tongass National Forest.

While the overall demand for National Forest timber has declined since 1980, timber harvest from private ownership has almost tripled. Because of lower demand for manufactured wood products, foreign buyers of timber products have been extremely selective, favoring only the highest and best quality material. Purchasers of National Forest timber sales are limited in their capability to respond to the lowered demand since they must incur the cost of harvesting and processing all the timber included in a timber sale contract—both high and low quality—within the time limit specified in the contract.

Balloon logging is an example of advanced logging technology referred to in the Tongass Land Management Plan.

In response to market demand, harvest on private lands appears to have been directed at the more accessible and better-quality timber. Because current harvest from private lands appears to consist of high-volume, high-quality old growth, it is anticipated that present private harvest levels will be difficult to maintain over an 80- to 120-year rotation. Timber harvests from private lands may range up to 350 million board feet (mmbf) per year until the mid to late 1990's if current market conditions continue (1984 ANILCA Supply and Demand Report). Once these finite high-quality stands of old growth are harvested, the remaining less valuable, low-volume stands will be more expensive to harvest and more difficult to market.

Long-term demand for Southeast Alaska timber has remained relatively constant. If demand continues at these levels there will be greater demand for National Forest timber for cant and dimension lumber production when harvests on private lands decline and harvest cost differentials narrow.

Figure 1.1 shows the distribution of timber harvest in Southeast Alaska between 1980 and 1984 by land owner or managing agency and log imports from Canada.

TONGASS NATIONAL FOREST TIMBER HARVEST ATTAINMENTS

The Tongass Land Management Plan (Forest Plan) anticipated an average annual timber sale volume of up to 450 mmbf. The sale level is consistent with the upper bounds of the allowable sale quantity[1] for the Tongass.

Figure 1.2 displays the Tongass National Forest timber program attainments for fiscal years 1980 through 1984. It compares the acres scheduled for harvest in the Forest Plan, the acres made available for sale, and the acres sold or released for harvest for the first five years of the Forest Plan.

Tongass National Forest timber is made available to industry through two types of sales: short-term sales and two long-term (50-year) sale contracts. The ANILCA timber supply is considered "made available" to industry when it has been offered for sale (for short-term sales) or prepared for release (for the long-term sales). The volume of timber made available from the Tongass to the timber industry has averaged approximately 491 mmbf per year. Of this, approximately 314 mmbf per year has been sold (or released). Although the ANILCA timber supply goal has been met, it is unlikely that an annual average of 450 mmbf will be sold in this decade unless there is an unusually rapid recovery and expansion of the timber market from current levels. For this report the volumes sold (released) by volume classes are compared to determine how well the Forest Plan sale goals are being attained. See table 1.1.

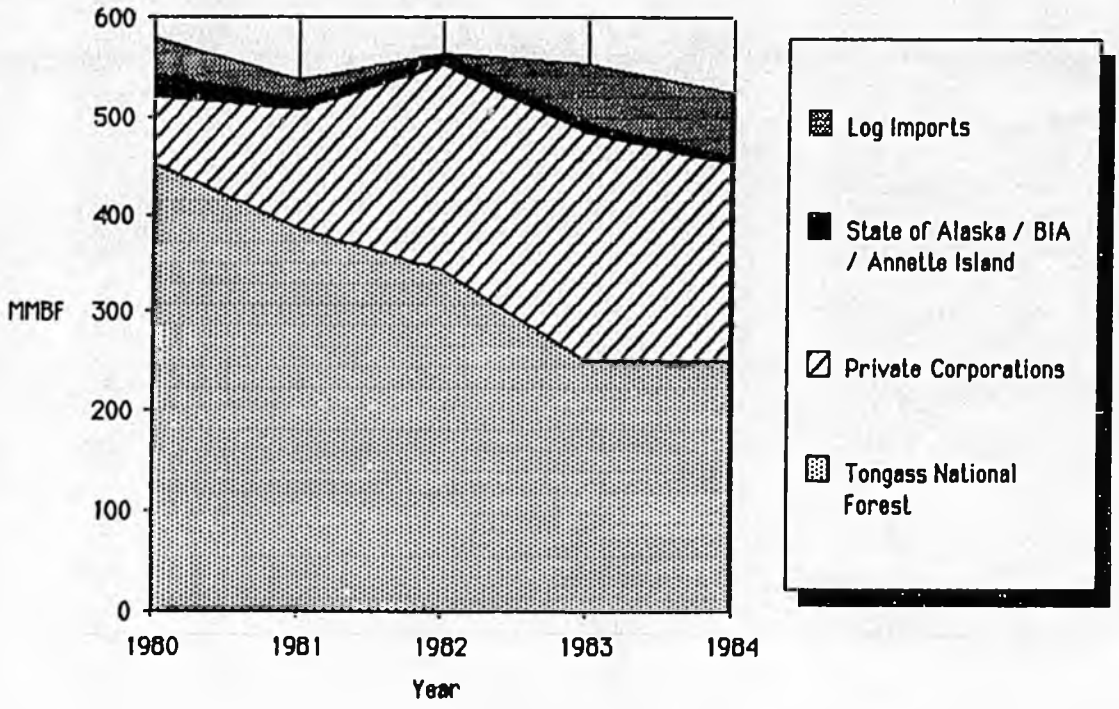
EFFECTS OF LAND STATUS CHANGES ON THE ALLOWABLE SALE QUANTITY

National legislation has had a dramatic effect upon the land status of the Tongass National Forest.

[1] Allowable sale quantity, as defined by the National Forest Management Act, is the quantity of timber that may be sold during the planning period (1979 to 1989) from land the Forest Plan identified as suitable for timber harvest. This quantity is usually expressed on an annual basis as the "average" annual allowable sale quantity.

Figure 1.1

Timber Harvests and Log Imports, Southeast Alaska, Calendar Years 1980–84
(Millions of board feet, log scale)[a]



[a]Includes utility volume. Log scale is the volume of timber as measured at the mill, without defect.
Source: ANILCA Section 706(a) Supply and Demand Report, 1984.

Figure 1.2

Tongass National Forest Timber Program Attainments Annual Average, Fiscal Years 1980–84

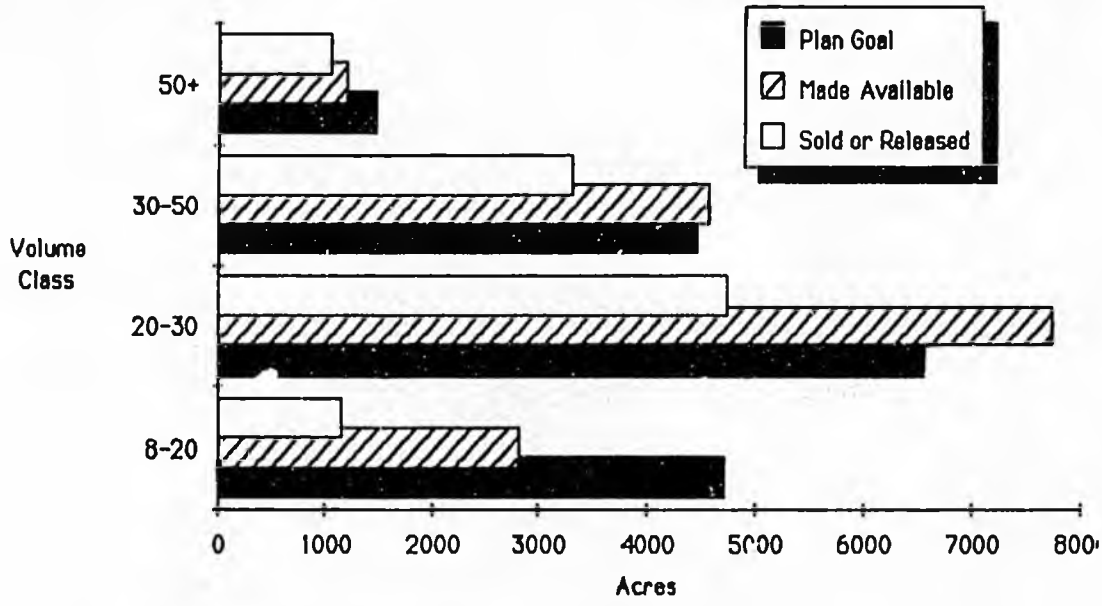


Table 1.1 — *Tongass National Forest Timber Program attainments, annual average for fiscal years 1980–84*

Volume class (mmbf/acre)	Plan goal[a]	Acres made available			Acres sold or released		
		Short-term	Long-term	Total[b]	Short-term	Long-term	Total
8–20	4,725	1,436	1,393	2,829	577	594	1,171
20–30	6,573	3,236	4,508	7,744	1,887	2,867	4,754
30–50	4,475	1,554	3,012	4,566	895	2,425	3,320
50 +	1,503	476	746	1,222	428	635	1,063
Total acres	17,276	6,702	9,659	16,361	3,787	6,521	10,308
Total volume (mmbf)	450	164	327	491	92	222	314

[a]Total acres under the "plan goal" include 970 acres per year from the allowable cut effect and 523 acres per year of advanced logging. While these 1,493 acres were not disaggregated by volume class in the Forest Plan, they have been broken down into their appropriate volume classes in this table.

[b]The Forest Plan attainment is measured on acres "sold or released." Total acres by volume class and volume "made available" may exceed the plan goal as long as the acres sold or released total by volume class and volume is equal to or less than the plan goal for the decade.

Source: Timber Management Information System STANDS Data Base and Tongass Land Management Plan Evaluation Report and the 1985 Forest Plan Amendment Data Base.

Changes which have occurred since the Forest Plan was finalized include:

1) ANILCA added 1,458,144 acres to the Tongass from the public domain and transferred 64,075 acres near Yakutat to the Glacier Bay National Park, resulting in a net addition of 1,394,069 acres to the National Forest System. In general, the lands added to the Tongass by ANILCA have a low value for timber production.

2) The Alaska Native Claims Settlement Act of 1971 (ANCSA) authorized the transfer of about 44 million acres throughout the State of Alaska from Federal management to private ownership. Under ANCSA, Native regional and village corporations were given the opportunity to select from National Forest System lands. At the time the Forest Plan was finalized, these corporations had tentatively selected 575,133 acres on the Tongass. These acres were excluded from the land base used for calculating the allowable sale quantity. The current selection figure is 549,839 acres based on adjustments by the corporations. While this does not represent the final selection figure, it can be used for determining the allowable sale quantity for the remainder of the planning period (1980–1989). The impact of this overestimation was to increase the allowable sale quantity by 3.7 mmbf annually. How this volume affects the attainment of the 450 mmbf annual sale quantity is displayed in the "Additional Information and Current Timber Sale Policy" section of this chapter.

3) The Alaska Statehood Act of 1958 authorized the selection of up to 400,000 acres from the Tongass and Chugach National Forests by the State of Alaska. The State selected 153,104 acres on the Tongass prior to Forest Plan implementation. These selected acres were considered unavailable for timber management during the development of the Forest Plan. Current inventory records indicate that 172,606 acres of land have been conveyed or have been approved for conveyance to the State, resulting in a net reduction of 19,152 acres from the total National Forest System acres estimated in the Forest Plan. The impact of this underestimation was to decrease the allowable sale quantity by 3.5 mmbf annually. How this volume affects the attainment of the 450 mmbf annual sale quantity is displayed in the "Additional Information and Current Timber Sale Policy" section.

Both State and Native selections on the Tongass National Forest will continue into the 1990's.

Effect of Land Status Changes in Commercial Forest Land on the Allowable Sale Quantity

The State and Native land selections and ANILCA have affected the total commercial forest land[2] as well as the total land base. The total Tongass land

[2]Commercial Forest Land (CFL) in the Tongass Land Management Plan was defined as forest land capable of producing 20 cubic feet of wood fiber per acre annually.

Table 1.2 — *Total and commercial forest land by land allocation*
(Millions of acres)

	Original Forest Plan land area				Present land area				
	Recommended Wilderness	Unroaded	Available for harvest	Total	Wilderness	Unroaded	Available for Harvest	Unallocated[a]	Total
Total land area	5.399	2.745	7.045	15.189	5.546	2.643	6.969	1.549	16.707
Total commercial forest land	1.646	0.532	3.514	5.692	1.660	0.495	3.486	0.095	5.736
Commercial forest land that can be harvested with existing equipment	—	—	1.811	1.811	—	—	1.796[c]	—	1.796[c]
Commercial forest land that requires new harvesting	—	—	0.443	0.443	—	—	0.439	—	0.439
Total land area not scheduled for harvest	5.399	2.745	5.092	13.236	5.546	2.643	5.219	1.549	14.957
Total commercial forest land available but not scheduled for harvest[b]	1.646	0.532	1.561	3.739	1.660	0.495	1.736[d]	0.095	3.986
Commercial forest land scheduled for harvest	—	—	1.953	1.953[f]	—	—	1.750[e]	—	1.750

[a]Unallocated areas include those that were recommended for wilderness classification by the Forest Plan but not included in the ANILCA wilderness designation as well as unallocated Forest additions made by the Act. These areas will be reconsidered for allocation during revision of the Forest Plan, and at the present time are being managed to maintain their wilderness characteristics.

[b]This is the commercial forest land that was not included in the calculation of the Forest allowable sale quantity. Included are Wilderness areas, areas managed for uses that preclude timber harvest (such as roadless areas, important wildlife habitat, and other administratively withdrawn areas), and areas where timber harvest would cause permanent resource damage.

[c]Includes 208,000 acres of low-volume marginal commercial forest lands.

[d]Includes 187,200 acres (90 percent) of the available low-volume, marginal commercial forest lands, and 298,000 acres (68 percent) of lands requiring new harvesting techniques.

[e]Includes 20,800 acres (10 percent) of low-volume marginal lands out of 208,000 acres available and about 140,500 acres (32 percent) of land requiring new harvesting techniques out of 439,000 acres available.

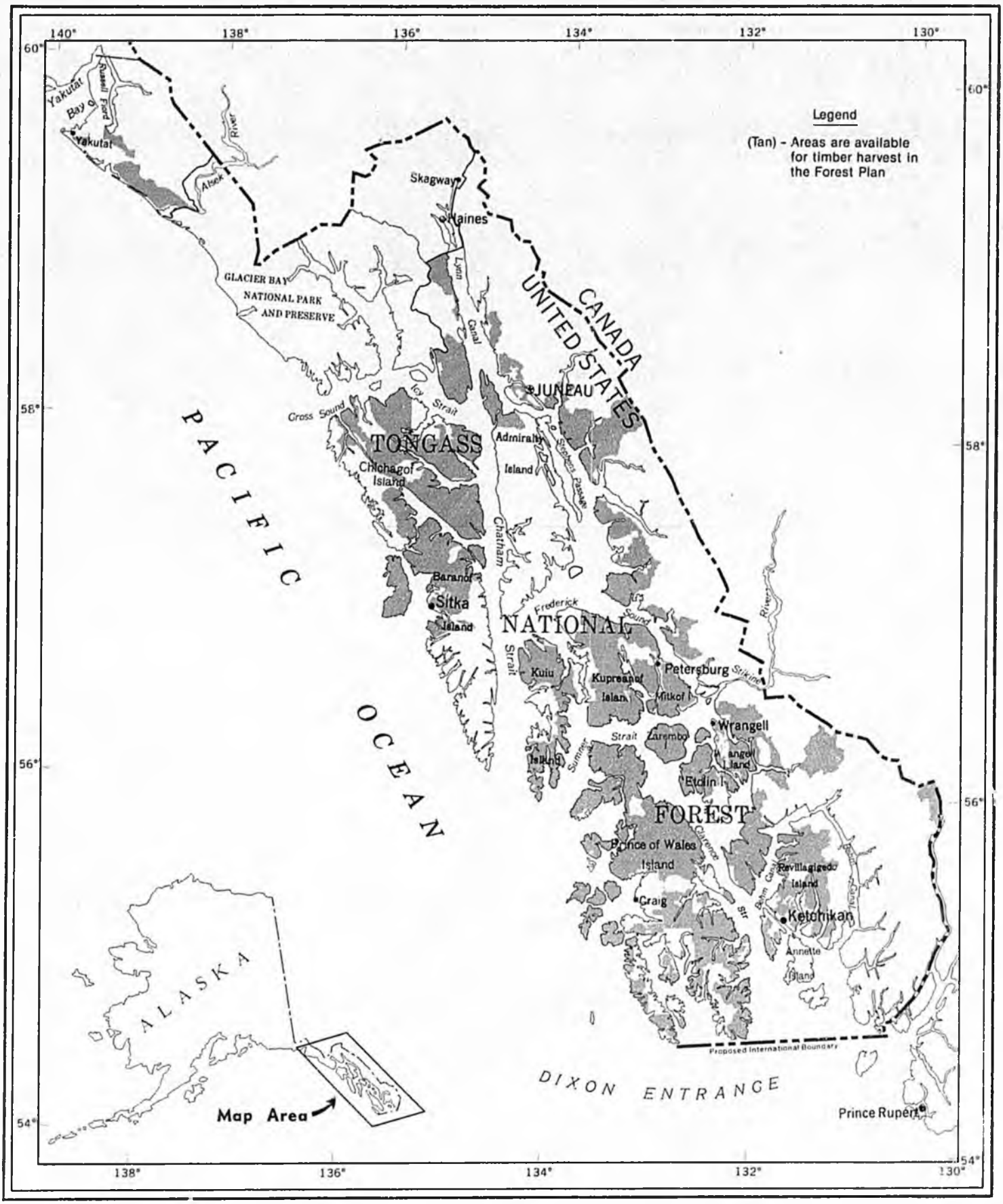
[f]The display of the "original" land scheduled for harvest figure includes approximately 193,500 acres that were not actually scheduled for harvest in the Forest Plan. To correct this display of area scheduled for harvest these acres are not included in the "present" figure.

base has increased by approximately 10 percent. While the total commercial forest land has increased by about 1 percent, the acres available for harvest have decreased by 1 percent due to State and Native selections and the final Wilderness Area boundaries established in ANILCA. Table 1.2 illustrates these changes. Map 1.1 identifies areas currently available for timber harvest.

The majority of the changes involved land that could be readily harvested using existing equipment and technology. (In contrast, land status changes have affected only 3 percent of the timber acreage that required new harvesting equipment or techniques not in common use on the Tongass during the 1970's.) Since all available acres (after deductions for other resource considerations such as wildlife habitat) were not included in the harvest schedule developed in 1979, there was enough flexibility to accommodate these changes and still not affect the Tongass timber supply.

An annual volume reduction in the allowable sale quantity of 15.0 mmbf was also made in the Forest Plan in anticipation of exchanges in land selections by certain Native corporations.[3] Of the 15.0 mmbf allowance, 5.7 mmbf have actually been used to date

[3]These corporations had made several selections on Admiralty Island (a recommended Wilderness Area), and active negotiations were underway to exchange selected lands on Admiralty for lands located elsewhere on the Forest. These alternate selections were expected to decrease the National Forest acres available for harvest.



Map 1.1—**Areas Available for Timber Harvest**

in the land adjustment process. Future selections under provisions of the Alaska Statehood Act (1959) and the Alaska Native Claims Settlement Act (1971) will further reduce the National Forest acres available for harvest. For example, up to 92,400 acres of State selections from National Forest System lands remain which could result in a direct net reduction of approximately 6-10 mmbf per year if all of these selections were made from the Tongass. These selections may also have indirect impacts on National Forest timber harvest by restricting access to otherwise available commercial timber areas. Given the present land status and funding provision, the annual 450 mmbf timber supply can be maintained.

ANALYSIS OF TIMBER SUPPLIED TO INDUSTRY THROUGH THE TONGASS TIMBER SUPPLY FUND

Before analyzing its effects, a brief description of how the funding for the Tongass Timber Supply Fund was developed may prove useful.

Planning Efforts

The amount of forest land available for harvest in the final Forest Plan was determined by selecting a mix of forest goods and services considered acceptable to Forest users. One important compromise sought in the Forest Plan was between unroaded areas and areas available for management activities which would alter the existing landscape, such as timber harvest. In attempting to reach this compromise three variables received special consideration: (1) methods needed to harvest timber (operability); (2) the types and restrictions on the management activities permitted in the area (land use designation [LUD]); and (3) the level of added investment necessary to make less productive, less accessible, or more environmentally sensitive land equivalent to lands already in production (in terms of roading and harvest costs).

The commercial forest land was divided into those areas which could be harvested with the equipment and harvesting methods already in use on the Forest during the late 1970's (normal operable), and those areas which required special equipment or harvesting methods not in use on the Forest at that time (marginally operable). The Forest was also divided into four land use designations. Of the four designations, Land Use Designations III and IV are available for timber harvest. Environmental standards are maintained in both these land use designations. The Forest Service realized at the time of the Forest Plan's development that the reduction in the available land base and the selected mix of goods and services would require additional funding to maintain a timber supply of 4.5 billion board feet per decade.

Normal Timber Sale Investments

Sales requiring investments in equipment and harvesting methods already in use on the Forest prior to the Forest Plan are called normal timber sales. The miles of timber road construction and the relative proportion of each tree species in these normal sales are similar to economically viable sales that were sold prior to the development of the Forest Plan.

The original planning records indicated that the normal program could provide an annual average timber volume of approximately 338 mmbf that would be economical under the prevailing conditions at the time the Forest Plan was developed using standard harvest systems and equipment. The annual funding required to support this 338 mmbf program was estimated to be approximately $22.5 million per year (1985 dollars). To achieve an annual sale goal of 450 mmbf, the remaining volume would have to be obtained through intensive timber management or from economically marginal and/or environmentally sensitive areas. (See the "Contribution of Added Investments to the Allowable Sale Quantity" section of this chapter.)

Of the total average annual volume made available between 1980 and 1984 (491 mmbf), approximately 411 mmbf per year has been from forest land classified as requiring normal timber harvest systems. Of the normal volume offered for sale (prepared for release on the two long-term sales), an average annual volume of 251 mmbf has been sold (released on the two long-term sales), leaving approximately 160 mmbf per year as offered but unsold (not released on the two long-term sales).

The reduction between the volume anticipated in the Forest Plan to be sold and the volume actually sold is primarily due to sale price, harvest costs, species mix, and potential markets. These factors have made many of the sales unattractive to potential timber purchasers. Table 1.3 displays the average annual attainment and cost of the timber sale program (under "Normal Investments").

Tongass Timber Supply Fund

ANILCA Section 705(a) provides for funding of at least $40 million annually, or as much as the Secretary of Agriculture finds necessary to maintain the timber supply from the Tongass National Forest. This funding is necessary to compensate for the loss of higher-quality areas available for timber harvest prior to the Forest Plan and ANILCA. The fund, entitled the Tongass Timber Supply Fund, was based on the Forest Plan estimate of the funding necessary

Table 1.3 — *Timber Management Program projected in the Forest Plan and actual annual attainment for fiscal years 1980–84*

	Projected annual average Forest Plan FY 1980-89		Actual annual average attainment FY 1980-84	
	Volume (mmbf)	Cost[a] (1985 mm$)	Volume[b] (mmbf)	Cost (1985 mm$)
Volume available with:				
Normal investments				
Land Use Designation III[c]	67	4.4	96 (21)	5.2
Land Use Designation IV[d]	271	18.1	315 (139)	16.7
Added investments				
Preroading[e]	60	22.2	40 (14)	3.7
Preroading funds obligated but volume not yet sold/released[f]	—	—	—	10.9
Precommercial thinning (ACE)[g]	34	4.6	34 (___)	4.3
Advanced logging technology[h]	18	4.3	6 (3)	0.7
Total cost and associated volume	450	53.6	491 (177)	41.5

[a] Original 1978 dollars in the Forest Plan have been converted to 1985 dollars using a factor of 1.52 based on the GNP Implicit Price Deflator.

[b] The volume in parentheses indicates the portion of the total volume fully prepared and offered for sale/release but not purchased. Funding for preparation is included in the Cost column.

[c] Land Use Designation III (LUD III) represents areas identified in the Forest Plan to be managed where emphasis is directed at providing a combination of both amenity and market values (aesthetic values and products of forestry or mining). The goal is to achieve compatibility among resource uses within the same area to provide the greatest combination of benefits. An error in the original Forest Plan calculation has been corrected by decreasing the volume available with normal investments by 3 mmbf and $0.2 million. For simplicity, the Forest Plan displayed all LUD III volume as qualifying for "Preroading." *Annual cost includes support and sale preparation of 67 mmbf. The Forest Plan assumed, for developing cost information, that the LUD III areas would be accessed by purchaser credit road construction even though the areas qualified for preroading.*

[d] Land Use Designation IV (LUD IV) represents the areas identified in the Forest Plan to be managed where emphasis is on market values. The goal is for environmentally sound development and use of these resources. It includes all volume considered available using harvest methods and equipment normally used on the Forest. An error in the original Forest Plan calculation has been corrected by increasing the volume available with normal investments by 3 mmbf and $0.2 million. *Annual costs include support and sale preparation of 271 mmbf assumed in the Plan to be able to be accessed by purchaser credit road construction.*

[e] Volume accessed and sold as a result of preroading timber sales for mitigation of effects on other resources (reduction of environmental impacts) or where the sale conditions are less than those qualifying as economically viable when the Forest Plan was developed. Cost includes Forest Service road construction, engineering support, and sale preparation. *To get a complete picture of volume and cost of the preroading program, LUD III Normal Investments must be considered as available for preroading.*

[f] Preroading obligated in fiscal years 1980-84 for future sales or used for sales previously offered but unsold.

[g] Volume derived from increased future yields resulting from precommercial thinning of 6,300 acres per year ("Allowable Cut Effect"). Cost includes thinning and sale preparation.

[h] Volume from areas requiring logging systems not presently used on the Tongass National Forest. There is an additional 8 mmbf of this component included as incidental annual volume in the normal sales program of the Forest Plan. Cost includes sale preparation and research/administrative studies

Source: Tongass Land Management Plan, Timber Management Information System STANDS Data Base, and 1984 ANILCA Section 706(a) Supply/Demand Report.

to continue a timber sales program similar to the timber program prior to ANILCA.

The intent of the Tongass Timber Supply Fund under the post-ANILCA timber sales program was to ensure that a timber operator would have approximately the same chance of success or failure as the operator had before ANILCA. There was no guarantee of profit or continuing high timber markets.

The fund included monies for the additional investments needed to accomplish the Forest Plan sale goal. These additional investments include (1) preroading to access selected areas with special resource needs, or where sale conditions are worse than those defined as being economically viable when the Forest

Plan was developed; (2) precommercial thinning to accelerate growth of regenerated stands; and (3) research/administrative studies to develop and/or implement more sophisticated logging systems to allow harvest of areas traditionally too difficult to log. Table 1.3 shows the original Forest Plan volume goals and estimated cost associated with each of these added investment categories.

Contribution of Added Investments to the Allowable Sale Quantity

Added investments contribute 112 mmbf per year to the allowable sale quantity from timber activities which were not economically or technologically viable at the time the Forest Plan was developed. The 112 mmbf volume is composed of 60 mmbf accessed by preroading of economically marginal areas or areas with special resource needs, 34 mmbf due to precommercial thinning, and 18 mmbf from advanced logging technology (table 1.3). These investments do not include the 67 mmbf from preroading in Land Use Designation III. The Forest Plan estimated the cost of making this 112 mmbf available to be approximately $275 per thousand board feet (mbf). The actual costs have averaged $245 per mbf. The added investment program included 24 mmbf ($13.3 million) within the ongoing timber program prior to ANILCA and 88 mmbf ($17.8 million) designated for additional preroading and intensive timber management practices (1985 dollars).

The following discussion focuses on each of the three investment activities called for under the added funding.

Roading

Road construction is necessary to access most timber sales on the Tongass National Forest. Two methods have been used for accomplishing and funding this timber road construction. The first method calls for the purchaser to construct the roads necessary to harvest the timber in the sale. As the roads are constructed, the purchaser earns purchaser credits that can be applied against the value of the timber purchased rather than paying cash. In times of depressed markets, however, the selling value of the timber may not earn the purchaser enough credits to recover the costs of the road. When timber is purchased under these conditions, the portion of road construction cost above the available timber value is termed "ineffective." In these instances, the purchaser must determine whether the timber value is high enough at the time of sale, or will become high enough during the life of the timber sale contract, to cover the logging and road construction costs and still provide a reasonable profit.

A second road funding method calls for the Forest Service to construct the road through a public works contract in advance of the timber sale award. Such construction is termed preroading. The Forest Plan anticipated a portion of the volume accessed would require Government investments. Preroading is necessary to offset the increased cost of harvesting economically marginal volume and meeting additional environmental considerations called for in the Forest Plan.

Roads and other transportation facilities constructed under both methods are considered long-term investments and will be used in future timber harvests, as well as in meeting other resource objectives identified in the Forest Plan.

During the development of the Forest Plan, both methods of construction were anticipated. There had been some preroading prior to the Forest Plan, but due to the prevailing high timber value and availability of lands for harvest, timber road construction was primarily funded by purchaser credit. It was anticipated that an increase in the number of miles of preroading would be necessary to access the marginal timber areas required to meet the Forest Plan goal. The additional road mileage and consideration of other resource objectives were the basis for the preroading portion of the ANILCA Tongass Timber Supply Fund.

The Forest Service policies for selecting areas for preroading were based on:

1. The need to access areas where environmental protection and mitigation required additional investments (primarily Land Use Designation III).
2. The need to access other economically marginal areas where the value of the timber was less than the cost of road construction at the time the Forest Plan was developed (Land Use Designations III and IV).

Figure 1.3 displays the timber roading investments that were obligated in fiscal years 1980–84.

Comparisons between the actual contribution of preroading and the original Forest Plan estimates are based on construction costs and the volume contribution of roads associated with sales that have been sold to short-term timber sale purchasers or harvest units formally released for long-term sale contracts. The timber volume accessed by roading is displayed in two categories: (1) roads associated with timber sales sold or formally released between fiscal years 1980 and 1984, and (2) roads obligated for construction to access timber sales planned in the near future. While the ANILCA-funded roads may be under construction or in place, the volume accessed is not counted towards the Forest Plan sale goal until the timber is sold or formally released.

Table 1.4 shows the total volume, miles, and cost of both preroading and purchaser credit road construction that has contributed to the Forest Plan sale goal or is planned in the near future.

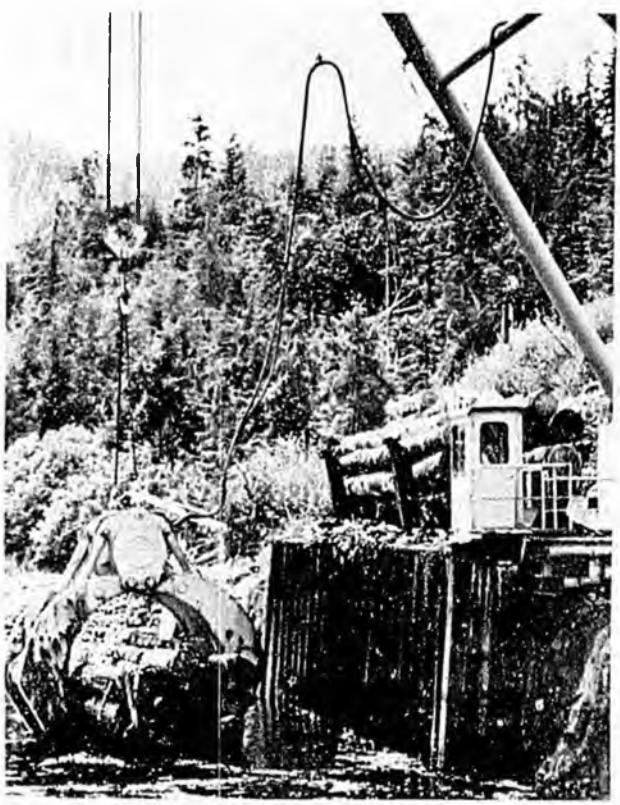
Preroading will be conducted within areas contributing up to 127 mmbf annually to the allowable sale quantity composed of volume made available in Land Use Designation III and from the added investments in economically marginal areas of Land Use Designations III and IV. The 127 mmbf volume is composed of 67 mmbf from normal investments in preroading of Land Use Designations III areas and 60 mmbf from added investments in preroading of both Land Use Designation III and IV areas (table 1.3). In the Forest Plan an annual average of 46 miles of preroading is planned. The annual average cost of the road construction, survey, design, and contract administration was estimated to be $18.8 million (1985 dollars). When the additional costs of timber sale preparation and administration, including support from other resource specialists, are added to the preroading costs, the total cost of the 127 mmbf annually was estimated to be $26.6 million in 1985 dollars (see table 1.3).

Since Tongass Timber Supply Funds were not available until 1981, the benefits of preroading continue to lag behind actual completion of road construction. Timber sales began being offered in 1982 in areas where preroading provided by the Tongass Timber Supply Fund contributed to the Forest Plan sale goal. From fiscal years 1980 to 1984, the average annual contribution of preroading to the allowable sale quantity was 26 mmbf of timber sold. Access to this 26 mmbf involved 7.5 miles of road construction or reconstruction (including an average of 1 log transfer site per year) at an average cost of $3.7 million (1985 dollars) per year.

A better representation of the preroading program is the number of miles of road and other transportation facilities that are currently under construction or planned in the near future that have been funded by the Tongass Timber Supply Fund. Timber stands accessed by these facilities will contribute to the timber supply in the near future. Roads and facilities for the 1980--84 period include 4 log transport facilities, 6 miles of road construction completed pending timber sale award, 173 miles of road construction or reconstruction public works contracts that have been awarded, and another 37 miles of road planned in the near future. Completion of these transportation facilities will provide access for an additional 288 mmbf of timber sales currently scheduled in the Forest Plan (table 1.4). Over the next 25 years it is estimated an additional 400 mmbf will become available from these roads and facilities.

With the demand and value for products made from National Forest timber less than expected, the reduction in the overall timber program has resulted in fewer miles of roads being built or planned than anticipated by the Forest Plan. For instance, the Forest Plan anticipated that an annual average of 152 miles of new roads would be built by the timber purchaser. Figure 1.3 displays miles of road actually constructed by year for the period 1980–84. Purchaser-constructed roads over this period have averaged 83.7 miles per year.

A greater proportion of the Tongass Timber Supply Fund than was anticipated has been used for construction of log transfer facilities associated with roads built by timber purchasers and for the reconstruction of existing roads. As originally conceived in the Forest Plan, 40 percent of the commercial forest land that could be harvested with existing equipment and technology would be accessed during the initial entry of a drainage. This would provide harvest from stands having a mix of timber quality, ranging from economically marginal stands requiring preroading to high-volume stands from which purchaser credit roads could be financed. The change in the demand and value of timber has resulted in changes to the Forest policy in implementation of the timber sale road program.



At log transfer facilities logs are moved from water to land where they are then sorted.

Table 1.4 — *Road construction for volume actually sold or released (FY 1980–84) and volume to be sold in the near future*

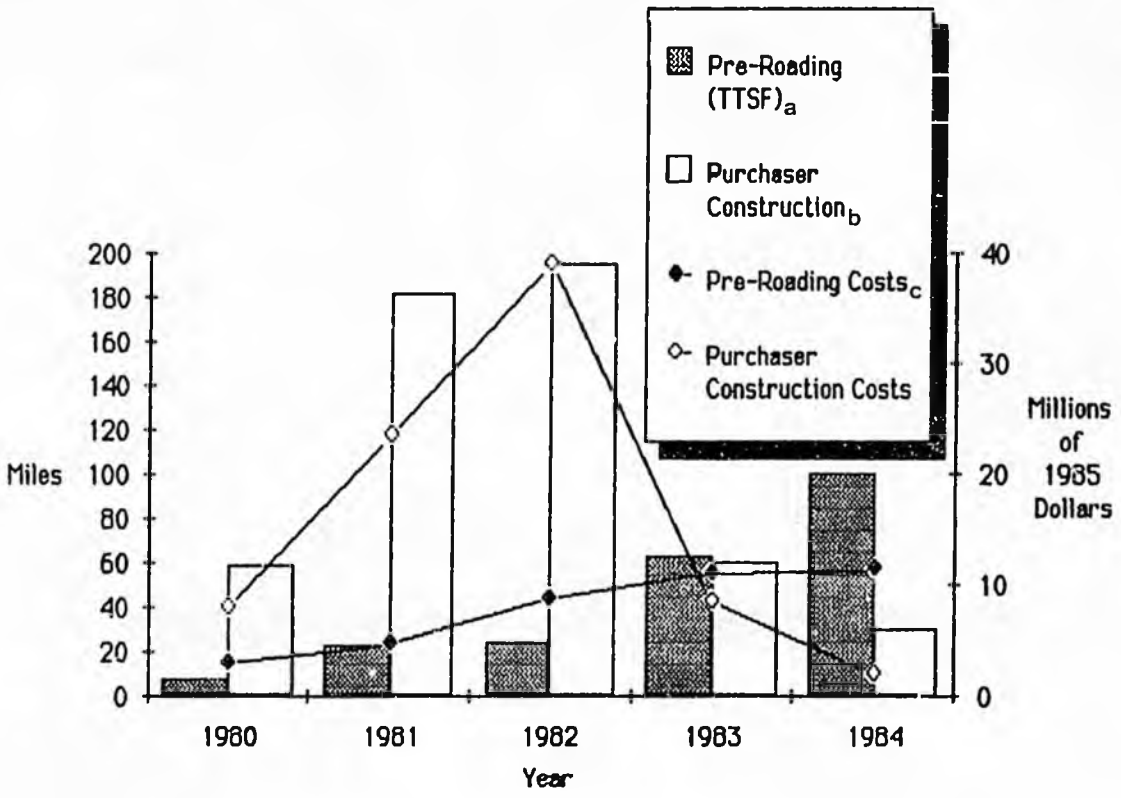
	Volume sold			Volume planned[a]		
	Volume (mmbf)	Miles	Cost (mm$)	Volume (mmbf)	Miles	Cost (mm$)
Preroading	131	38.1	5.6	288	215.6	41.4
Purchaser construction	1,438	374.8	59.0	493	267.7	49.9

[a] These are timber sales scheduled for the near future or sales which have been offered and unsold and scheduled for reoffer. *Includes 1985 obligated preroading funds.* Cost includes road construction only; sale preparation and support not included.

Source: From Timber Management Information System STANDS Data Base by individual timber contract road requirement. Nominal cost converted to 1985 dollars using the GNP Implicit Price Deflator for 1st Quarter, 1985.

Figure 1.3

Timber Road Funds and Miles of Construction Contracts Awarded on the Tongass National Forest, Fiscal Years 1980–84



[a] Preroading includes 48.8 miles of reconstructed roads and 9 terminal transportation facilities. A terminal transportation facility (TTF) is located where the road network terminates and logs are bundled and placed into rafts on the water for towing to local mills.

[b] Purchaser Construction includes 108.9 miles of reconstructed roads and 1 terminal transportation facility.

[c] Road funding prior to ANILCA. Since the Tongass Timber Supply Fund was not available until mid FY 1981, the first year of the Forest Plan implementation was through appropriated funds. These are considered to be consistent with added investments.

Source: FY 1980 Year End Closeout Report and 1984 ANILCA Supply/Demand Report. Nominal cost converted to 1985 dollars using the GNP Implicit Price Deflator for 1st quarter, 1985.

Precommercial Thinning

Precommercial thinning is an intensive timber management practice involving the thinning of very young stands (usually age 10–15 years) to improve the spacing and species composition, to optimize growth, and to shorten the time between harvests. The Annual Allowable Sale Quantity calculation of 450 mmbf was based on harvested areas becoming fully restocked with commercial trees and being free to grow after establishment. Natural regeneration was the primary source for stocking, but planting could be used to supplement natural regeneration if necessary to achieve full restocking.

Thinning is important because 34 mmbf of the 450-mmbf sale quantity (7.5 percent) is based on the expectation of increased growth and yields produced by thinning an average of 6,300 acres per year. This increased yield is often termed the "Allowable Cut Effect" (ACE) of precommercial thinning.

The precommercial thinning acres and cost since fiscal year 1980 are shown in table 1.5.

Since 1980, public works contracts averaging 6,339 acres per year have been awarded. The amount of ANILCA Tongass Timber Supply Fund (TTSF) expended for precommercial thinning has averaged $2.4 million per year (1985 dollars). An additional $1.9 million has been spent on sale preparation and sale administration of the 34 mmbf "allowable cut effect," for a total of $4.3 million annually. The Forest Plan anticipated a total cost of $4.6 million (1985 dollars) for the thinning and sale preparation.

Based on the actual acres being thinned and the associated cost, the allowable cut effect on the timber supply is adequate to meet both Forest Plan and ANILCA objectives.

Advanced Logging Technology

As defined in the Tongass Land Management Plan, advanced logging technology is use of equipment or techniques not commonly in use on the Tongass National Forest at the time the Forest Plan was completed. Advanced logging was required for the harvest of certain components of the available land base.

These components of the Forest were classified by the degree of difficulty in conducting timber harvest operations. Factors such as slope, soils, and accessibility were considered in determining the difficulty. The degree of difficulty was termed "operability." For the Forest Plan the operability of all commercial forest lands was classified as being either normal, marginal, or inoperable for timber harvest. Normal harvest operability is defined as timber which can be harvested with existing equipment and standard technology. These logging systems include highlead, A-frame, singlespan skyline with reaches less than 2,600 feet, and tractor.

Marginal harvest operability requires timber harvest equipment and technology that is not in common use, such as helicopter, balloon, multispan skyline, and singlespan skyline with reaches greater than 2,600 feet.

Inoperable timber is that which cannot be harvested by any proven method without unacceptable resource damage or harvest cost. The operability classification was considered in designating lands available for timber harvest on the Tongass.

Some of the commercial forest land classified as having marginal harvest operability is scheduled for harvest in the Forest Plan. To harvest the amount scheduled would require advanced logging systems not in common use. The contribution to the annual allowable sale quantity of 450 mmbf from timber requiring new harvest equipment and technology is 18 mmbf, at an estimated cost of $4.3 million (1985 dollars). This cost includes increased Forest Service timber sale preparation costs and research projects required to implement advanced logging systems.

There has been 28.4 mmbf of timber made available in the advance logging category for fiscal years 1980–84. Of this, 13.6 mmbf has been sold, for an annual average of 2.7 mmbf. This annual average represents 15 percent of the annual sale goal for advanced logging technology. An annual average of 5.7 mmbf has been made available.

Timber harvests in areas requiring new equipment and technology, under any market condition, will be less than in areas requiring standard techniques. Since the total demand for timber from the Tongass has been below the annual average allowable sale

Table 1.5—*Precommercial thinning acres and cost contracted, fiscal years 1980–84*
(Costs in 1985 dollars)

	1980	1981	1982	1983	1984	Total	Average
Contracted acres	4,364	6,807	6,545	6,834	7,145	31,695	6,339
Contract cost (mm$)	1.3	2.1	3.3	2.4	2.7	11.8	2.4

Source: Actual contracted acres from Forest Service Management Attainment Reporting System (FY 1980–82) and Timber Management Information System (FY 1983–84).

quantity of 450 mmbf, local industry has deferred timber purchase where advanced logging technology is required.

The demand for timber offered in areas where standard harvesting methods can be used must increase significantly before harvest from areas requiring new techniques will match those levels anticipated in the Forest Plan.

STATUS OF THE ANILCA TIMBER UTILIZATION LOAN PROGRAM

The Forest Plan recogr. .ed that if public demand for Wilderness and timber were to be met, more intensive use of available timber would be needed. This means that the poor-quality, low-profit timber must be harvested along with the higher-quality, more profitable timber. To this end, ANILCA directed the Secretary of Agriculture to establish a loan program to aid Alaska National Forest timber purchasers in acquiring the equipment and new technology that would allow the use of more wood products than is currently being used. To date there has been little demand for timber from areas requiring advanced logging equipment or volume resulting from higher utilization standards. If demand does not increase, it is unlikely this loan program will be needed during this decade.

ADDITIONAL INFORMATION AND CURRENT TIMBER SALE POLICY

Tongass National Forest Timber Program Attainments

The original harvest schedule developed for the Forest Plan (table 1.1) did not display the acres available as a result of the allowable cut effect and the advanced logging technology by volume class. To assist in assessing the effects of these programs the updated schedule is displayed by volume class for all scheduled acres.

When compared to the Forest Plan goals, there is a greater proportion of the higher-volume classes being sold. When supply exceeds demand, this condition is to be expected. The short-term implementation of the Forest Plan is not in jeopardy as long as the actual volume sold or released in a specific volume class does not exceed the original schedule (see figure 1.2). The effects of underachieving the volume class mix in any given decade do not detrimentally affect allowable sale quantities in subsequent decades. However, in old-growth forests, such as the Tongass, underachievement during a decade does postpone achieving the long-term sustained yield capacity of the commercial forest land available for timber harvest. The impacts of "underachieving" will become evident by the reduced acreage of second-growth stands available for harvest in 80–100 years.

Effects of Land Status Changes on the Tongass National Forest

An adjustment of 15 mmbf of timber per year was applied to the original yield calculation in the Forest Plan in anticipation that Native corporations with selection rights on Admiralty Island would select Forest Service-administered lands in other locations on the Forest. As a result of ANILCA Section 506, selections which moved these corporations off Admiralty Island were considered finalized in 1980. The reduction in annual volume available was 5.7 mmbf of timber per year. The remaining adjustment (9.3 mmbf) is available to absorb the impacts of additional changes in the Forest's land base.

The current status is:

Category	Net volume (mmbf)
Original calculation of land status changes anticipated	15.0
Effects of Native selections	
Kootznoowoo	−5.2
Goldbelt	−0.5
Shee Atika	0.0
Remaining	9.3
Changes from Forest Plan assumptions	
Underestimated effects of State selection	−3.5
Revised Native selections	+3.7
Total remaining 1985	9.5

Under the Statehood Act, the State may select up to 92,400 additional acres on the Tongass National Forest. These State selections could affect up to 10 mmbf of volume annually which is currently available for timber harvest. Such selections could potentially offset the 9.5 mmbf shown above as remaining in 1985.

Improving the Cost Effectiveness of the Timber Program

The Forest Service has made available an annual average of 491 mmbf of timber from the Tongass National Forest between 1980 and 1984. Of this, 177 mmbf a year was fully prepared and offered for sale, but has not been sold or released. To improve the cost effectiveness of the timber program, the Forest has begun to take steps to reduce much of the on-site final sale preparation cost. These steps allow for the completion of the time-consuming NEPA and

permitting processes. However, expenditures for items such as sale boundary marking, volume estimation, and timber appraisal are to be delayed until it is determined that the dependent industry needs additional volume made available to fulfill harvest requirements. Once implemented these revised procedures will help eliminate potential duplication of costs for sales which do not sell and must be re-offered. This, in turn, will help to reduce the total cost of making timber available to dependent industry, while ensuring that timber volumes can be offered for sale on short notice should demand for additional timber develop.

Tongass Timber Sale Fund Expenditure for Timber Sale Road Construction

Due to the uncertainty of the current timber market; the lead time necessary to design, contract, and construct a road; and the amount of timber that has been prepared but remains unsold or not released, the "preroading" program has been reassessed. More emphasis will be placed on roading only those sales that are in current demand by the timber industry. Funding by the Government of a portion of the cost of a purchaser-constructed road, called augmentation, will be used as well as the established preroading program. Augmentation has the advantage of funding only roading activities that the timber industry currently needs while providing a better cash flow situation for the timber operator.

Criteria for preroading and timber sale road augmentation include:

1) Access areas where multiple resource objectives and quality standards require additional investments (primarily Land Use Designation III).

2) Sale conditions are less than those calculated as being economically viable when the Forest Plan was developed. As defined in the Forest Plan, a sale that was not economically viable had the following characteristics:

a. The short-term sale volume accessed, or the long-term harvest unit volume within a transportation network accessed, is less than 3 mmbf per mile of road constructed.

b. The Sitka spruce component of the sawlog volume represents less than 30 percent of the total sawlog volume for the sale or harvest units within a transportation network. This is an indication of the value of the product mix. The greater the proportion of Sitka spruce, the more valuable the timber.

c. The amount of low volume (8-20 mbf per acre) and/or volume classified as marginal operability represents more than 10 percent of the total sale volume or harvest unit volume in a transportation network.

Strict environmental quality is maintained even as new construction standards have reduced the cost of road building. Current roads, such as this one on Chichagof Island, are designed to "lay lightly on the land."

These criteria are consistent with the Forest Plan objective of developing a sale program so that a timber operator would have approximately the same chance for success as an operator prior to ANILCA. There is no guarantee of profit or market conditions.

There continues to be confusion over the scope and intent of the Tongass Timber Supply Fund and how it relates to the added investments identified in the Tongass Land Management Plan.

The State of Alaska and the Southeast Alaska timber industry feel that the Federal Government should provide sufficient funding to make an average annual harvest of 450 mmbf economically feasible, regardless of market conditions; that funding provided in the Supply Fund should be adequate to meet road costs when timber values are insufficient to cover these costs; and that funding for these roading costs should be used in all harvest areas, not just those considered marginal at the time the Forest Plan was developed.

By contrast, the Southeast Alaska Conservation Council feels that current funding levels are subsidies to the timber industry and that the Supply Fund level should be commensurate with the receipts returned to the Government from the sale of National Forest timber.

The Forest Service for its part, and Legislative history surrounding the Act, recognized that the standards and guidelines developed in the Forest Plan for Wilderness, other unroaded primitive recreation areas (Land Use Designation II), for the management objectives of other resources, and environmental protection measures would all require the increased use of economically and technologically marginal timber from the Tongass National Forest. To make this marginal timber equivalent to the timber being offered for sale prior to the Forest Plan, added investments

for preroading, precommercial thinning, and advanced logging technology would be necessary. These added investments were then combined with the normal funding for the timber program in existence prior to implementation of the Forest Plan. The result is the Tongass Timber Supply Fund, as provided for by ANILCA Section 705(a).

The intent of the added investment portion was to make marginal timber equivalent in costs to the timber being offered prior to the Forest Plan and ANILCA. As these costs are equalized, the market for manufactured Southeast Alaska timber products would determine the profitability of harvesting Tongass National Forest timber. The Tongass Timber Supply Fund was never intended to guarantee a market or a profit for these manufactured products.

The amount of public investments in the timber program on the Tongass has been increased during this time of depressed markets in accordance with the Forest Plan in order to maintain the stability of timber industry employment, which in turn helps in stabilizing the Southeast Alaska economy.

SUMMARY

Factors contributing to the timber harvest levels on the Tongass since the enactment of ANILCA are:

- The Forest Service, on the average, has made available over 491 mmbf per year to the dependent timber industry. An average of 314 mmbf per year has been sold or formally released since the implementation of the Forest Plan.
- The Tongass is able to supply the 4.5 billion board feet per decade with the current land base and funding requirements estimated by the Forest Plan. It appears that this capability will hold true as the private land selections are finalized.
- The normal timber sale program was estimated to contribute an annual average of 338 mmbf of the 450 mmbf timber volume made available. Since 1980, an annual average of approximately 411 mmbf from the normal sales program has been made available (of the total 491 mmbf made available); however, only 251 mmbf of normal volume per year has been sold (released on the two long-term sales). The remaining annual average of 160 mmbf has been offered and unsold (not released on the two long-term sales). The available timber supply from the Tongass National Forest will continue to exceed demand until market conditions improve.
- Part of the Tongass Timber Supply Fund was intended for investments to maintain a 4.5-bbf-per-decade timber supply to the dependent timber industry and, therefore, employment for those southeastern Alaskans either directly or indirectly employed by the timber industry. These investments included preroading (roads built using public works contracts prior to sale), precommercial thinning, and research and administrative studies for the development and implementation of advanced logging systems (equipment or harvest techniques not commonly in use on the Tongass at the time the Forest Plan was developed):

  Preroading: The Forest Plan estimated that an average of 60 mmbf per year of economically marginal timber would be accessed by preroading with an additional 67 mmbf per year eligible for preroading from Land Use Designation III areas. The actual annual volume accessed with preroading investments has averaged 26 mmbf per year from economically marginal timber stands plus 75 mmbf from the Land Use Designation III areas. As construction is completed for preroading projects currently under contract, an additional 288 mmbf will become available this planning period (1980–89) and an estimated additional 400 mmbf over the next 25 years.

  Precommercial thinning: Considering acres currently under contract, the required annual average of 6,300 acres of precommercial thinning will be met. It is anticipated that the additional volume calculated for precommercial thinning will be realized.

  Advanced logging technology: Since the advanced logging volume tends to be the least attractive to timber purchasers, only 15 percent of the annual average volume anticipated from advanced logging systems has been attained from 1980 through 1984. Additional sales of this volume are unlikely while timber markets are depressed. Research on advanced logging systems is continuing.
- In figure 1.5 the anticipated timber volumes from normal and added investments in the Forest Plan are compared to the volumes made available, sold, and harvested for the same investment categories (normal and added).
- The Timber Utilization Loan Program created by ANILCA has not been implemented due to the lack of demand for timber volume from areas requiring advanced logging technology. If demand does not increase, it is unlikely that the program will be needed during this decade.

Figure 1.4

Miles of New Road Construction on the Tongass National Forest, Fiscal Years 1978–84

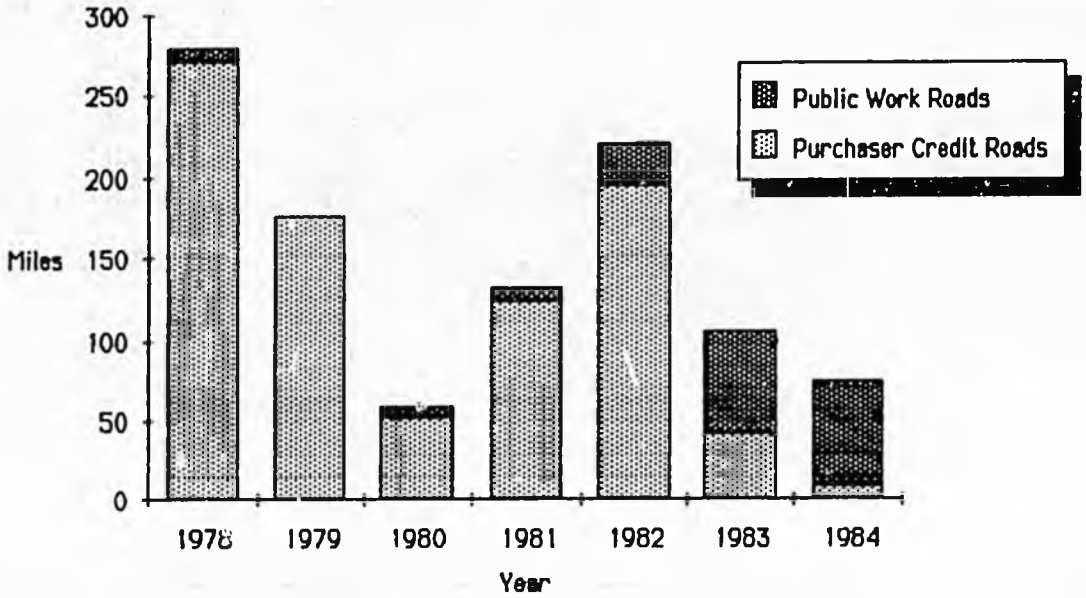
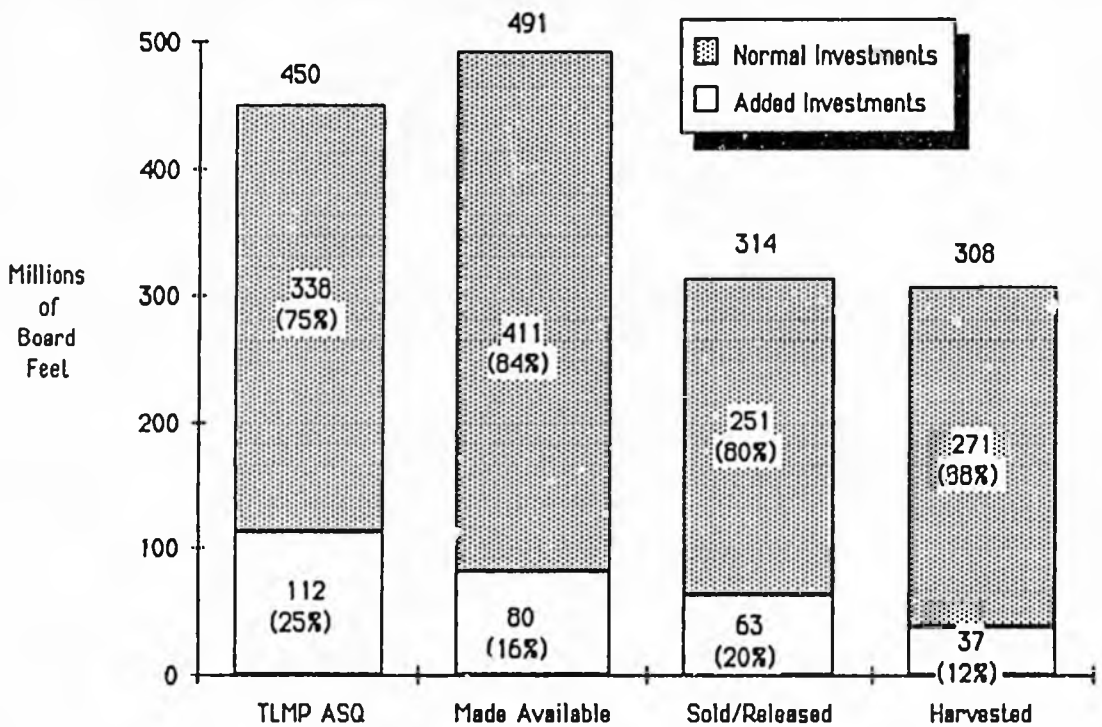


Figure 1.5

Average Annual Timber Volume Attributed to Normal and Added Investments in the Forest Plan Versus the Volumes Made Available, Sold, and Harvested, 1980–84



Alaska Department of Fish and Game.

The majority of anadromous fish caught in Southeast Alaska spawn in streams on the Tongass National Forest.

Chapter 2

Impact of Wilderness Designations on the Timber, Fisheries, and Tourism Industries of Southeast Alaska

In this chapter the effects of Wilderness designation on the timber, fisheries, and tourism industries of Southeast Alaska are explored. Trends in employment and income in these industries are presented for the period 1977 to 1984. While these trends are difficult to link to the formal creation of Wilderness, they do provide a broad overview of what has happened to these industries in the years leading up to and since the passage of ANILCA. For the timber industry, the effects of Wilderness are put in terms of the potential costs associated with lost harvest opportunities, greater reliance on low-volume stands, and stands requiring special harvest technology. The analysis focuses on the period 1980–84, but potential long-term impacts are also considered. In creating formal Wilderness, ANILCA also established special provisions for fisheries habitat protection and enhancement within these areas. These provisions are described. The potential contributions of completed and proposed fisheries enhancement projects to the commercial fishing industry are summarized. To estimate the impact of Wilderness on the tourism industry three broad indicators are used. These include recreation use trends before and after the formal creation of Wilderness in ANILCA, the use of "wilderness" in promotional campaigns by the industry, and a survey of recreational tour operators in Southeast Alaska to determine their perceptions on the impacts of Wilderness.

With the passage of ANILCA, Congress designated over 5.4 million acres as formal Wilderness on the Tongass National Forest. A concern of Congress in passing ANILCA was the impact of Wilderness on the three major industries in Southeast Alaska: timber, fisheries, and tourism. While formal Wilderness designation encompasses 5.4 million acres of the Tongass National Forest, other large areas of the Forest remain roadless and, therefore, maintain some wilderness characteristics. These areas include almost 2.7 million acres of primitive, nonmotorized acreage maintained on the Forest for this planning period (1980–89) plus other portions of the Forest that range from the Juneau Icefield to areas available for developmental activities which could be roaded in the future. Total acreage of the Forest which is not roaded is conservatively estimated to exceed 11 million acres. Examination of the impact of Wilderness on the three industries is clouded by the inability to clearly separate the effects of designated Wilderness from the effects of these other, unroaded areas.

Trends in employment and earnings in these industries since 1977 are shown in figures 2.1 through 2.4.[1] While changes in these measures cannot be linked directly to Wilderness designation, the figures do provide a general overview of what has happened in each industry during the years leading up to and since the passage of ANILCA. The figures are intended to show general trends rather than precise levels of employment and earnings. Government, both Federal and State/local, also has been included because of its important role in the Southeast Alaska economy.

Figure 2.1 shows trends in direct employment based on the average annual number of workers within each industry. While the job numbers have been averaged for seasonal differences, they do not reflect differences in full-time and part-time employment. For this reason, it is important to supplement the job number information with the direct earnings data

[1] All numbers are based on historic data from the Alaska Department of Labor, *Catch and Production Statistics* from the Alaska Department of Fish and Game, and simulations using a Forest Service input-output model, IPASS. Tourism/recreation sector estimates are based on a 1982 study of the visitor industry by the Alaska Division of Tourism (*Alaska Traveler Survey and Visitor Industry Analysis 1983*, Alaska Department of Commerce and Economic Development, Division of Tourism and Alaska Department of Labor, Juneau, AK, 1984) and extrapolated for other years. Trends for commercial fishing do not include recreational and subsistence use values.

in figure 2.2. Taken together, these figures provide a fairly good picture of what has happened in these industries over time. Government continues to be the major employer in Southeast Alaska. Only in the last year has this sector shown any reduction. Since 1980, both job numbers and employee earnings within the timber industry have declined. Despite the fact that there were fewer workers in 1984 in the timber industry compared to commercial fisheries/seafood processing and recreation/tourism industries, direct earnings in timber were still greater. This reflects the relatively higher wages paid in the timber industry, and the fact that many jobs in the recreation/tourism industry, particularly in retail trade and the eating and drinking sectors, are part-time. In the fishing industry, the average annual number of workers has remained relatively constant since 1977, dropping only slightly after 1980. Earnings have remained virtually unchanged. It should be noted that the relatively constant level may be due to the limited entry program enforced throughout this time period for salmon and herring fisheries. The tourism industry has shown an increase in the number of workers, but little change in earnings. Again, this underscores the importance of considering both job numbers and earnings. Much of the increase in the number of workers in the tourism industry may be a result of part-time employment. Thus while the number of jobs appears to have increased fairly substantially since 1977, it is not clear whether the number of full-time equivalent positions has also increased as total earnings show no real changes over the same time period.

Figures 2.3 and 2.4 reflect trends in the indirect and induced effects[2] that employment and earnings in one industry have on other industries. These effects reflect the linkages between industries within the region, and employment and earnings trends caused by money circulating through the economy. As the figures indicate, secondary impacts are dominated by government. While indirect and induced employment effects are greater in the timber sector compared to commercial fisheries/seafood processing and recreation/tourism, this trend begins to reverse itself in later years for income, with recreation/tourism having greater indirect and induced income effects in 1984.

In the remainder of this chapter, Wilderness impacts on each of the three industries are examined individually. For the timber industry, Wilderness impacts are analyzed in terms of land base availability, the resulting effects on access, and the quantity and quality of timber available to dependent industry on the Tongass since ANILCA. Implications for long-term harvest opportunities are also considered in evaluating Wilderness impacts. Under ANILCA, special management provisions were established for fisheries resources in Wilderness areas. In the fisheries subsection, these provisions and what has been done to meet them through cooperative planning and habitat enhancement are described. Also, the impact of Wilderness designations on fisheries is discussed with respect to the management provisions for fisheries in the non-Wilderness portion of the Forest. Three broad indicators are used in examining Wilderness impacts on the tourism industry: pre- and post-ANILCA use trends, the use of "Wilderness" and wilderness images in promotional trends within the industry, and a survey of recreational tour operators to find out what they perceive to be the impact of Wilderness designations in Southeast Alaska.

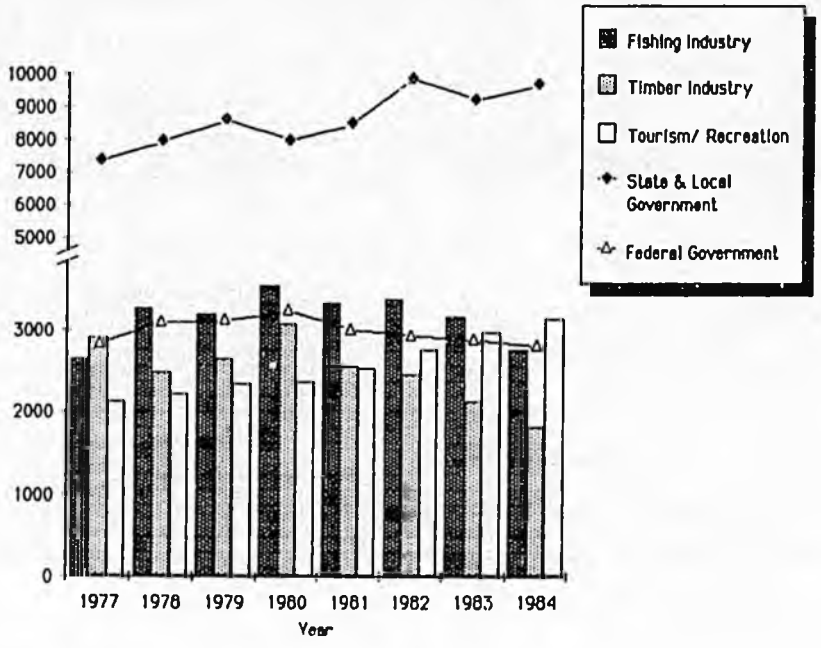
EFFECTS OF WILDERNESS DESIGNATION ON THE TIMBER INDUSTRY

Both the Tongass Land Management Plan and ANILCA introduced changes in the Forest land base which reduced the area and the number of high-volume stands available for timber harvest. These reductions were designed to meet a variety of multiple use management objectives, including fish and wildlife habitat needs, visual quality protection, the size and spacing of harvest units, and allocations for Wilderness and unroaded areas. The original commercial forest land base in the late 1970's was estimated to have a potential yield of 1,182 mmbf per year with an associated annual allowable sale quantity, consistent with the management criteria specified in the Forest Plan, of 535 mmbf. With the reduced base, the Forest Plan estimated that all of the low-volume timber stands available using existing harvest methods and approximately 32 percent of the areas requiring advanced logging equipment would have to be included in the timber harvest schedule to supply an average of 412 mmbf of timber annually. In addition, a precommercial thinning program of 6,300 acres per year would be needed to reach 450 mmbf annually. If the same investments were applied to a land base including all the normal operable commercial forest land (harvestable using

[2] Indirect and induced effects represent the impact of economic activity in one sector on other sectors. For example, in order to produce pulp, a mill must purchase raw materials (wood, chemicals), services, equipment, and additional manufactured goods from other sectors. These purchases create jobs and income for the people who work in the sectors providing those goods and services (indirect effects). This income, in turn, is spent on a multitude of goods and services, stimulating additional activity in other sectors over time (induced effects). As might be expected, the number of rounds of money circulation that occurs in an area before the dollars and associated indirect and induced impacts "leak" out depends on the structure of the area's economy. In Southeast Alaska, where imports and exports play a major role, leakages from some sectors tend to occur almost immediately.

Figure 2.1

Direct Job Numbers[a] by Sector[b] in Southeast Alaska, 1977–84



[a]Since job numbers do not reflect differences in full-time and part-time employment, it is important to supplement this information with the earnings data in Figure 2.2 before making sector comparisons.

[b]Timber industry includes forestry consulting, logging, sawmills, and pulpmills. Fishing industry includes commercial harvesting and seafood processing, but not recreational fishing due to lack of information. Tourism/Recreation includes a composite of visitor-related industries. Government includes State/local and Federal administration and enterprises.

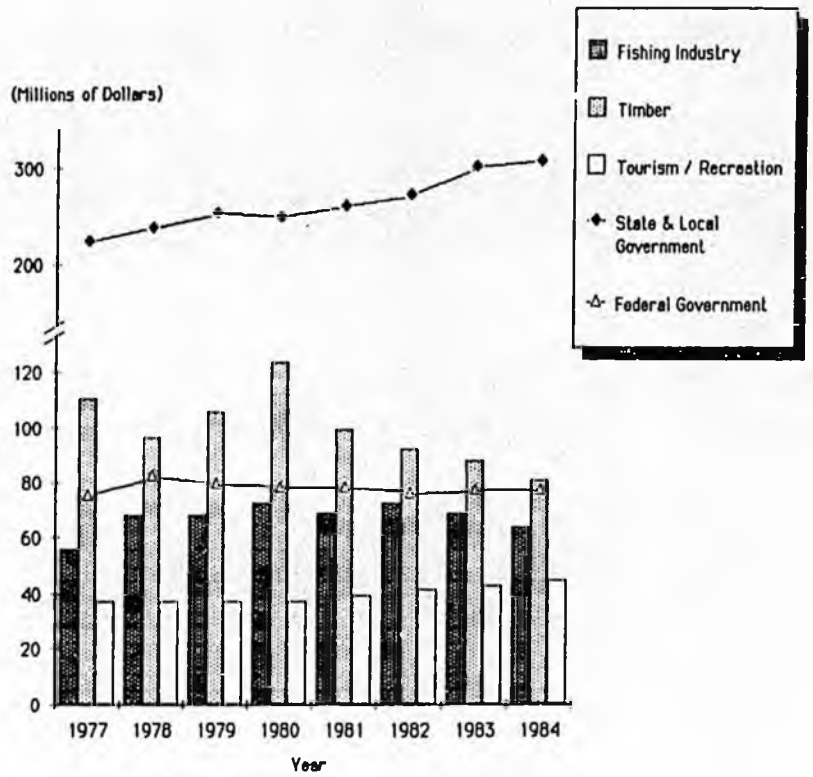
Source: Direct levels are from historical data from the Alaska Department of Labor and simulations using a Forest Service input-output model, IPASS.

standard harvest technology) on the Tongass National Forest, an allowable sale quantity of 614 mmbf could have been attained.

This section of the chapter examines the effects of one facet of these reductions on the available commercial forest land base: the impacts of Wilderness designation on the timber industry. Both short-term (since ANILCA) and potential long-term effects are considered. Two points are common to both short-term and long-term effects. The first is that the reduced timber base restricts the opportunities for expansion of existing industry or entry of new investments in the Southeast Alaska timber industry. The other point is that the 4.5-bbf-per-decade sale goal freezes the existing mix of long-term and short-term timber sales for as long as the long-term contracts continue. The current mix of sales by volume is approximately two-thirds long-term and one-third short-term. Short-term impacts evaluated include the quality of timber sales made available to the timber industry and whether any access limitations have occurred since ANILCA. Long-term impacts may include possible increases in harvest costs and changes in the quality of the timber which may be made available due to increased reliance on low-volume and "nonstandard" areas (areas that require special harvest technology). The measure of quality used is the volume of timber per acre, called volume class. Normally the higher the volume per acre, the larger the individual trees are and the lower the costs to harvest the timber. These impacts are discussed in general terms, since other variables such as market cycles and future price levels make precise measures difficult.

Figure 2.2

Direct Earnings[a] by Sector[b] in Southeast Alaska, 1977–84



[a] All earnings have been converted to 1985 dollars using the GNP Implicit Price Deflator for first quarter, 1985.

[b] Timber industry includes forestry consulting, logging, sawmills and pulpmills. Fishing industry includes commercial harvesting and seafood processing. Tourism/Recreation includes a composite of visitor-related industries. Government includes State/local and Federal administration and enterprises. Earnings from fish harvesting are estimated at between 40 and 57 percent of the annual gross receipts to fishermen. See: *The Alaska Fishing Industry: An Overview of State Expenditures and Economic Benefits,* Alaska State Legislature: House Research Agency Report No. 81-4, January, 1982, for a discussion of the problems of estimating harvest earnings.

Source: Direct levels are from historical data from the Alaska Department of Labor and simulations using a Forest Service input-output model, IPASS.

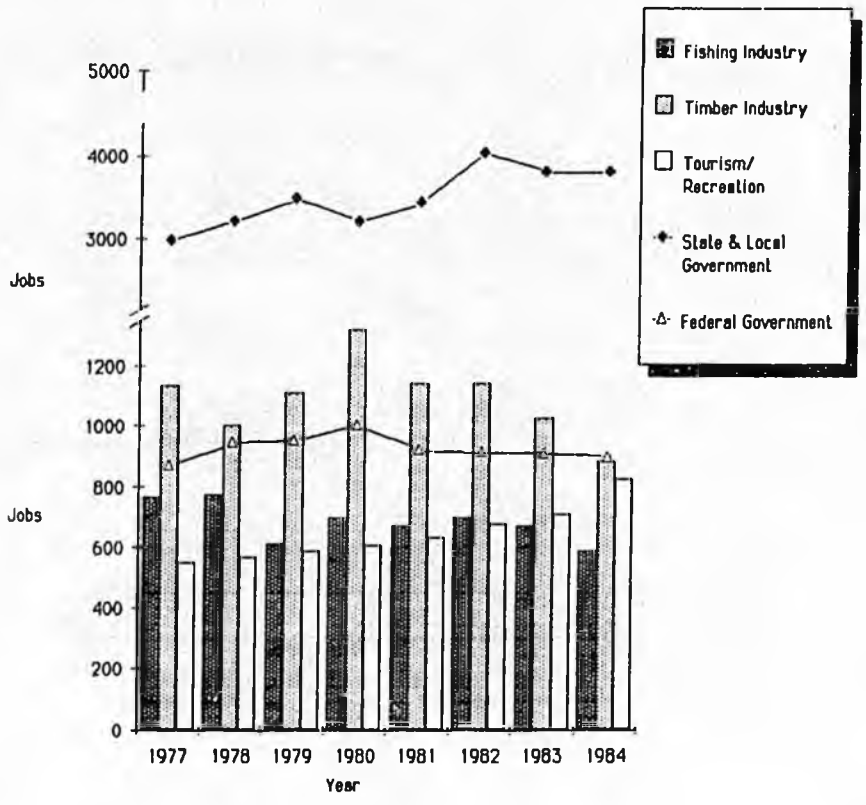
Short-Term Impacts Since ANILCA

The designation of 14 Wilderness areas reduced the commercial forest land base available for harvest on the Tongass by 1.65 million acres or approximately 28 percent. Approximately half of this commercial forest would be considered harvestable under the criteria established in the Forest Plan. Over the short term, it was anticipated that the effects of this reduction, in acres available for timber harvest, would be reflected in increased harvest of lower-volume classes and increased use of special harvest technology in the remaining available areas. These anticipated effects were based, in part, on the assumption that greater reliance would be placed on low-volume stands outside Wilderness boundaries, since high-volume stands within Wilderness were no longer available for harvest.

Actual acres prepared and sold or released between 1980 and 1984 are compared with Forest Plan schedules in table 1.1 in chapter 1. While steady declines in the timber market since the passage of ANILCA have affected demand for all volume classes, only 26 percent of the lower-volume classes (8–20 mbf per acre) scheduled in the Forest Plan have been purchased as short-term sales or formally released to long-term sale operators since 1980. In addition, few of the areas requiring special harvest technology have been offered for sale or release. Therefore, short-term expectations about anticipated dependence on low-

Figure 2.3

Associated Indirect and Induced Employment[a] in Southeast Alaska, 1977–84



[a]Job number information should be supplemented with the earnings data in Figure 2.4 before making sector comparisons.

Source: All associated indirect and induced job numbers are estimated from IPASS.

volume timber and special harvest technology have not been realized due to the reduced level of harvest activity.

Another potential effect of Wilderness designation is the potential restriction on access to timber harvest units near Wilderness. The delineation of recommended Wilderness areas in the Forest Plan was designed to minimize access restrictions to adjacent commercial forest land scheduled for harvest. As ANILCA made only minor alterations to the recommended boundaries for the Wilderness areas, there has been no blockage of access to commercial forest land scheduled for harvest in the Forest Plan. There may, however, be increased costs for access to some areas adjacent to Wilderness areas, such as the southern tip of Tebenkof Bay Wilderness area and east of the West Chichagof-Yakobi Wilderness. In these cases interconnected road systems may require additional miles of road construction to avoid Wilderness areas in the future, or in some cases, may not be possible. Changes which increase road mileage or do not provide for interconnecting roads also result in higher administrative costs on the Forest. Costs to the timber industry would increase if additional logging camps are required.

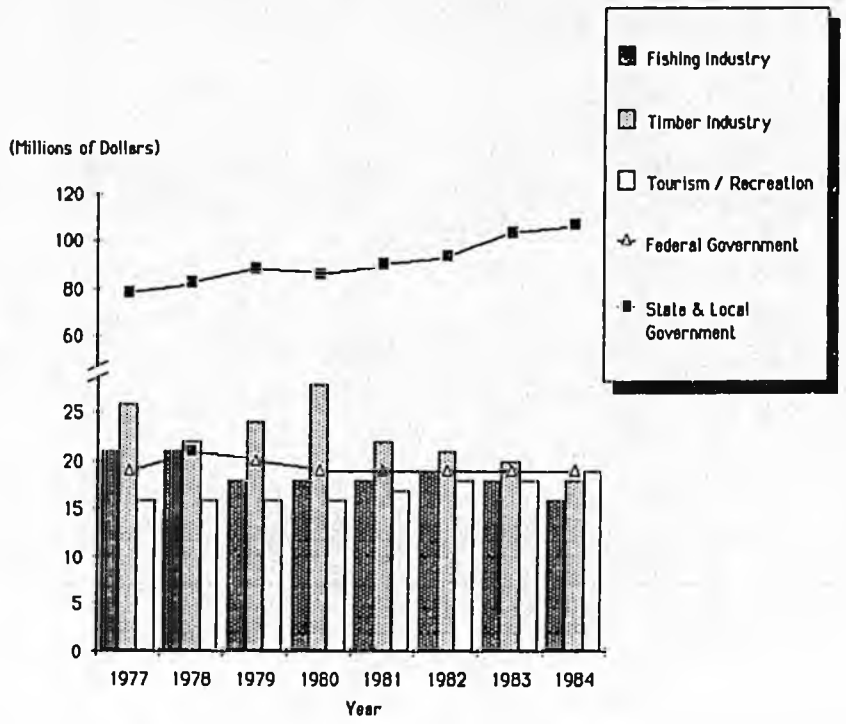
Poor market conditions have resulted in lower than expected harvest rates which in turn have masked effects of Wilderness designations on the timber industry since 1980 (ANILCA). Similarly, restricted access to harvest units due to Wilderness designations is not apparent. Because of reduced market demands since 1980, there has been little need to harvest the marginal areas identified in the Forest Plan which require higher logging and transportation costs.

Possible Long-Term Impacts

The impact of Wilderness on timber can also be expressed as a loss in harvest opportunities on commercial forest lands within units of the National Wilderness Preservation System and areas maintained

Figure 2.4

Associated indirect and Induced Earnings[a] in Southeast Alaska, 1977–84



[a]All earnings have been converted to 1985 dollars using the GNP Implicit Price Deflator for first quarter, 1985.
Source: Associated indirect and induced earnings are estimated from IPASS.

in a primitive, unroaded Land Use Designation (LUD II). Market cycles can either magnify or diminish the effects of these losses in the short run. However, in the long term, changes in the commercial forest land base can impact the distribution of potential timber harvest among different volume classes. This distribution, in turn, affects the costs and benefits of timber harvest over time. In this section, an analysis is made of possible losses in harvest opportunities. This is done by contrasting potential long-term timber harvest schedules under a commercial forest land base with and without the commercial forest lands within Wilderness areas.

Timber harvest schedules are simulated for two commercial forest land bases. The first includes only those lands currently available for harvest under the existing Forest Plan. The second land base includes commercial forest lands in ANILCA-designated Wilderness, but not in the areas administratively maintained as roadless by the Forest Plan (Land Use Designation II).

Management measures specified in the Forest Plan for retention of forest land for wildlife and fisheries habitat are reflected in both land base harvest schedules. Extended rotations in areas of high visual sensitivity, long-term sustained yield, and an average annual allowable sale quantity of 450 mmbf are also reflected in both schedules. If a 450 mmbf annual harvest ceiling were not imposed in both schedules, the average annual allowable sale quantity for the Forest would increase to approximately 535 mmbf without added investments (614 mmbf with added investments similar to the Forest Plan) under the larger land base if commercial timber in Wilderness areas and other primitive, nonmotorized areas (Land Use Designation II) were available for timber harvest. The Forest Plan's requirements for precommercial thinning and harvest of areas requiring special technology are included only in the schedule including areas currently available for harvest. These measures were added when Wilderness recommendations were made in the Forest Plan and the total commercial

forest land available was reduced and could no longer be considered for timber harvest.

Figure 2.5 displays the average annual harvest by volume class under the two assumed commercial forest land bases. As anticipated in the Forest Plan, with Wilderness unavailable for harvest, greater reliance is placed on the lower-volume classes, practices such as precommercial thinning, and the harvest of areas requiring special harvest technology. This reliance is needed to maintain a timber supply of 4.5 bbf per decade. When Wilderness areas are included in the harvestable land base, there is no longer a need for harvesting in the 8–20-mbf-per-acre volume class, the additional precommercial thinning, or the advanced logging technology to supply 4.5 bbf for this plan period (1980–89).

Summary

When Congress designated 5.45 million acres of Wilderness under ANILCA, the commercial forest land base on the Tongass National Forest was reduced by 1.65 million acres. Approximately half of this acreage would have been considered harvestable using the Forest Plan's criteria. Poor market conditions have resulted in lower then expected harvest rates. However, harvesting costs are expected to increase over time as a greater portion of the low-volume stands and areas requiring advanced logging technology are needed to achieve a 4.5-bbf-per-decade timber supply.

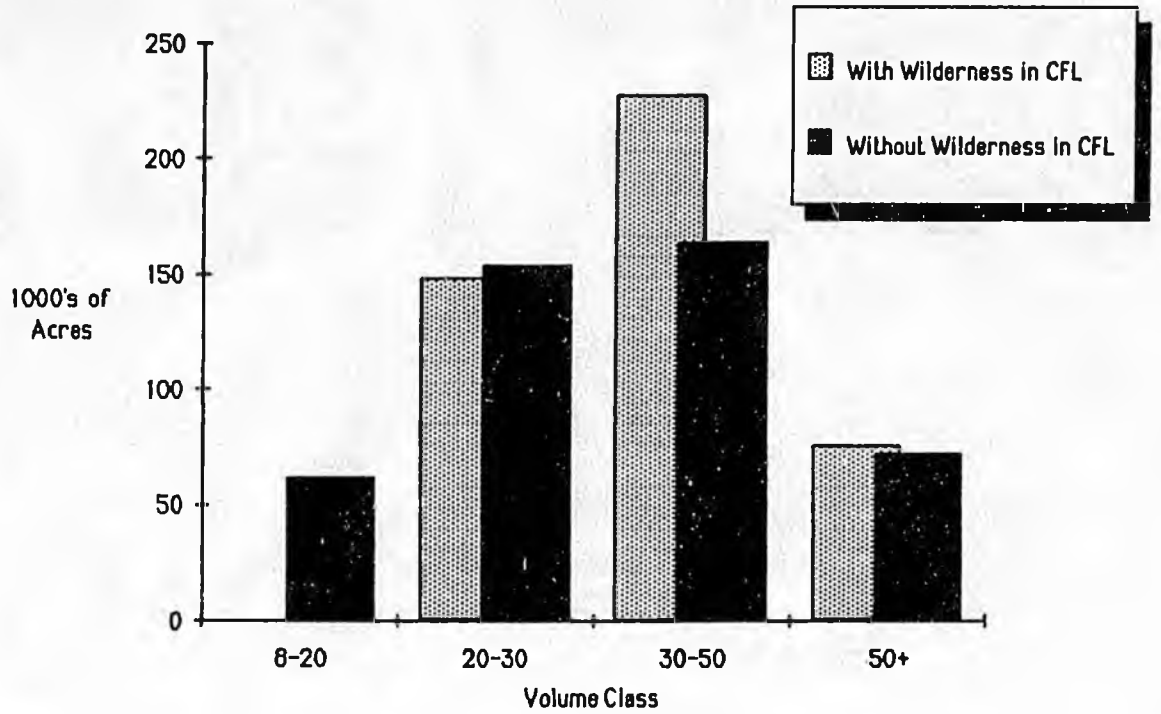
EFFECTS OF WILDERNESS DESIGNATION ON THE FISHING INDUSTRY

This section of the report examines fisheries management activities within Wilderness areas and the extent these activities impact the commercial salmon industry. For this report, the impact of Wilderness on the commercial fishing industry is evaluated in terms of opportunities for fisheries research, management, and habitat enhancement projects in Wilderness areas versus other National Forest lands. Forest Plan management direction for the non-Wilderness portion of the Forest stresses protection of the full biological productivity of streams and rivers and taking advantage of all fisheries enhancement opportunities. Due to this direction, there has been little difference in the effects of management actions on fisheries resources on the Wilderness and

Admiralty Island National Monument is an area having both outstanding natural beauty and high timber values.

Figure 2.5

Comparison of Annual Average Harvest Schedules by Volume Class for the First Decade With and Without Wilderness in the Land Base Available for Timber Harvest



non-Wilderness portions of the Forest.

ANILCA exempted the Tongass National Forest from some of the limits placed on fisheries research, management, enhancement, and rehabilitation activities in Wilderness areas under the 1964 Wilderness Act. Special management provisions in ANILCA recognized a goal of restoring and maintaining fish production in Alaska at optimum sustained yield levels while adequately assuring the protection and preservation of the Wilderness resource. In those Wilderness areas where fisheries improvement projects have not been programmed, Wilderness provides a natural benchmark from which fisheries habitat capability and production can be compared with managed habitats in other areas of the Forest.

In 1983, the Forest Service published management direction to guide fisheries project development on designated Wilderness areas in the Forest. Under this direction, fisheries enhancement activities are approved on the basis of need as determined through cooperative fisheries planning.

Management Situation

Commercial fisheries in the waters adjacent to the Tongass during the period 1980–84 harvested an average of 119.7 million pounds of salmon annually, at an average annual ex-vessel value (gross receipts to fishermen) of $72.8 million (1985 dollars).[3] This represents roughly 78 percent of the total ex-vessel value of all fish and shellfish landed in Southeast Alaska. Employment in the commercial fisheries industry of Southeast Alaska during this period averaged 2,124 jobs in the harvesting and 1,221 jobs in the processing sectors annually. Actual harvest levels for Southeast Alaska are shown in figure 3.2 in chapter 3 of this report.

Tongass fish resources are also important to the recreational fisheries of Southeast Alaska. During the period 1980—83, an average of 28,443[4] resident anglers participated in recreational fisheries and contributed about $20 million annually to the region's economy.[5]

Neither the commercial fisheries harvest figures or the resident angler figures can be divided into

[3] *Alaska Catch and Production Commercial Fisheries Statistics,* Statistical Leaflet Series, 1974-84. Alaska Department of Fish and Game.

[4] Mills, Michael J. *Statewide Harvest Survey,* Federal Aid in Fish Restoration F-9-16, Vol. 25, July 1, 1983–June 30, 1984. Alaska Department of Fish and Game, P.O. Box 3-2000, Juneau, AK 99802.

[5] Estimated value by Alaska Department of Fish and Game.

Wilderness and non-Wilderness categories. The discussion is included here as a means of identifying the overall management situation on the Forest. Since Wilderness makes up approximately one-third of the Forest, the relationship between commercial harvest and resident angler use and Wilderness designation can be put in perspective.

Cooperative Fisheries Planning and Fisheries Enhancement Projects

Special management provisions in ANILCA provided the Forest Service with the opportunity to conduct fisheries enhancement projects in Wilderness areas. Inventory and analysis of enhancement opportunities for Tongass National Forest fisheries are currently underway. When complete, this information will be used to determine the extent of fisheries enhancement needs within Wilderness areas. It will also determine the potential contribution of fisheries enhancement projects in restoring and maintaining fisheries production in the State at optimum sustained yield levels.

In accordance with ANILCA Section 507(a), and the intent of Section 1315(b), identification of opportunities to enhance fisheries resources on the Tongass National Forest is accomplished through cooperative fisheries planning. Cooperators include the Forest Service, the State of Alaska, and some of the nonprofit aquaculture corporations. In effect, Section 507(a) helps the integration of the State's regional fisheries planning with the Forest Service's land management planning process. For example, enhancement opportunities recommended in the Southeast Alaska Comprehensive Salmon Plans[6] are evaluated against other resource considerations and eventually will become the basis for the fisheries enhancement program on the Tongass, including Wilderness areas.

Fisheries enhancement projects completed on the Tongass National Forest since the enactment of ANILCA are presented in table 2.1 and are located on map 2.1. Projects proposed for development or implementation in accordance with the present Tongass 5-year schedule for fisheries improvements are summarized in table 2.2. These represent a full spectrum of structural and nonstructural enhancement activities, and include major fishway rehabilitation activities, lake stocking and fertilization, and the construction of a major hatchery facility by the Tlingit and Haida Central Council. Wilderness designation has not precluded the development of any enhancement projects to date.

In total, 41 fisheries enhancement projects have been completed on the Tongass since the passage of ANILCA, including 12 projects in Wilderness areas. It is estimated that these projects will contribute more than 6 million pounds (1.75 million pounds from Wilderness projects) of "new" salmon to the Southeast fisheries annually when full production potential is reached.

Bakewell fish ladder in Misty Fiords National Monument. The ladder was recently reconstructed in a cooperative effort between the State of Alaska and the Forest Service.

Summary

Wilderness designation has not had a measurable impact on the fisheries resources on the Tongass National Forest. Special Wilderness management provisions in ANILCA recognize a goal of restoring and maintaining fish production to optimum sustained yield levels. Fisheries management activities are conducted in a manner that adequately assures protection of the Wilderness resource. Forest Service management direction for the non-Wilderness portion of the Forest stresses protection of the full biological productivity of streams and rivers and takes advantage of all fisheries enhancement opportunities. Due to this direction, there has been little difference in the effects of management actions on fisheries resources on the Wilderness and non-Wilderness portions of the Forest.

The Forest Service has published Wilderness management direction in accordance with the cooperative fisheries planning and special Wilderness provisions of ANILCA. Enhancement projects are identified through cooperative fisheries planning and approved through individual NEPA documents and Tongass land management planning activities. Wilderness areas in which fisheries enhancement projects have not been planned provide a benchmark from which fisheries habitats and production levels can be compared with similar habitats and production levels in

[6]State of Alaska 20-year (1980–2000) salmon harvest restoration plans for Southeast Alaska.

Table 2.1 — *Wilderness/non-Wilderness distribution of Tongass National Forest fisheries enhancement projects completed during the period 1980-84*

Project location	Enhancement activity (No. of projects)	Estimated outputs[a] (m lb/yr)	Ex-vessel value[b] ($m/yr)
Wilderness			
	Lake fertilization (2)	380.0	406.6
	Lake stocking (2)	830.0	821.7
	Debris removal (2)	NA	NA
	Salmon hatchery (1)	540.1	330.1[c]
	Fish weir (egg take) (1)	NA	NA
	Fish weir (research) (2)	NA	NA
	King salmon habitat evaluation (2)	NA	NA
	State fishery law enforcement cabin (1)	NA	NA
Non-Wilderness			
	Fishways (11)	1,186.5	1,151.6
	Lake fertilization (2)	2,780.0	2,974.6
	Fish stocking (8)	175.0	173.3
	Spawning channel (1)	117.4	71.6
	Rearing pond (1)	5.4	5.4
	Debris removal (6)	NA	NA

NA = not available.

[a]Salmon production based on full utilization of habitat capability. The time it will take to reach full production varies with species and fisheries management strategies regulating the fish stocks returning to the projects.

[b]Ex-vessel values are gross receipts to fishermen and are derived from *Alaska Catch and Production Commercial Fisheries Statistics*, Statistical Leaflet Series; 1974-82. Alaska Department of Fish and Game, P.O. Box 3-2000, Juneau, Alaska 99802.

[c]Common property fishery harvest component of the estimated future production from this private nonprofit hatchery operated by the Tlingit and Haida Fisheries Development Corporation.

areas altered through other management activities.

Since the passage of ANILCA, 41 fisheries enhancement projects have been completed on the Tongass National Forest that have the potential to annually increase harvestable salmon in the fisheries by an estimated 6 million pounds (1.75 million pounds from Wilderness areas). Wilderness designation has not precluded the development of any Tongass National Forest fisheries enhancement project.

EFFECTS OF WILDERNESS DESIGNATION ON THE TOURISM INDUSTRY

This section of the report examines impacts Wilderness designations have had on the tourism industry of Southeast Alaska.[7] Three indicators are used to measure Wilderness impacts: use patterns and trends before and after designation, promotional trends within the industry, and tourism operator perceptions of those impacts. While the intent of this section is to focus on formally designated Wilderness, it is important to recognize that there are almost 2.7 million acres of primitive, nonmotorized areas maintained on the Forest for this planning period (1980-89) plus other areas within the Tongass that are not designated as Wilderness but have similar characteristics. Examples of these other areas range from the Juneau Icefield to areas available for developmental activities and which could be roaded. Total acreage on the Forest which is currently unroaded exceeds 11 million acres. Thus specifically isolating the impacts of formal Wilderness designation is not always possible.

Trends in Tourism

To get a more complete picture of tourism trends in Southeast Alaska, it is first necessary to understand the history of this industry and how it has evolved.

[7]Much of this section is derived from a paper entitled "Patterns of Tourism in Southeast Alaska—An Analysis of the Impact of Wilderness Designations on the Tourism Industry" by Larry Bright, a graduate student in Natural Resource Management at the University of Alaska, Fairbanks.

Map 2.1—**Location of Fisheries Enhancement Projects**

Table 2.2 — *Fisheries enhancement projects presently proposed for Tongass National Forest Wilderness*

West Chichagof-Yakobi Wilderness

- Rust Creek—Proposed nonprofit hatchery.
- Goulding Lakes—Proposed site for a private nonprofit hatchery.
- Waterfall Cove—Fish passage improvement for pink and chum salmon is recommended at this site.

South Baranof Wilderness

- Falls Lake—This proposed fish passage improvement is to accommodate additional spawning adults returning to Falls Lake as a result of the ongoing lake fertilization program.
- Benzeman Lake—Lake fertilization to increase salmon production.
- Southeast Baranof Lakes—Salmon stocking.

Tebenkof Bay Wilderness

- Wolf Creek—Fish passage over barrier falls.

Admiralty Island National Monument Wilderness

- Ward Creek—A significant enhancement opportunity requiring fish passage improvement and brood stock development.
- Fishery Creek—A significant enhancement opportunity requiring fish passage improvement and brood stock enhancement.

Stikine-LeConte Wilderness

- Andrew Creek and Ketili Creek—Alaska Department of Fish and Game and Regional Aquacultural Association instream fish weir, trapping and tagging of juveniles, and other studies on chinook salmon.

Misty Fiords National Monument Wilderness

- Boca De Quadra—A major salmon hatchery facility in this area is recommended by the Southern Regional Aquaculture Association and fishermen user groups.
- Mainland Rivers—The Unuk, Chickamin, Wilson-Blossom, Keta River, and some smaller systems are significant producers of salmon. Direct habitat improvements to increase salmon production have been identified for development.

Historical Perspective of Tourism

For a century now, people have been venturing north to experience the scenic beauty of Alaska's Inside Passage. While the actual number of visitors has fluctuated, the industry has grown over time. In 1884, 1,650 tourists visited Southeast Alaska via steamship. By 1890 the Pacific Coast Steamship Company (PSC) was doing a thriving business with 5,007 tourists booking passage.

The late 1960's ushered in a trend toward larger cruiseships in Southeast, primarily with larger companies, such as the Princess Lines, entering the market. By 1975, cruiseship visitation to Southeast Alaska had grown to an estimated 46,000 passengers. Another trend of the late 1960's and early 1970's was the small but rapidly growing demand for "hands-on" wilderness experiences. The rise in environmental awareness and interest in protecting remaining wilderness coincided with the continued growth in visitation to Southeast Alaska. The single most consistent trend one can follow in the development of the visitor trade in Southeast, has been the persistent demand for the natural scenic beauty of Southeast Alaska.

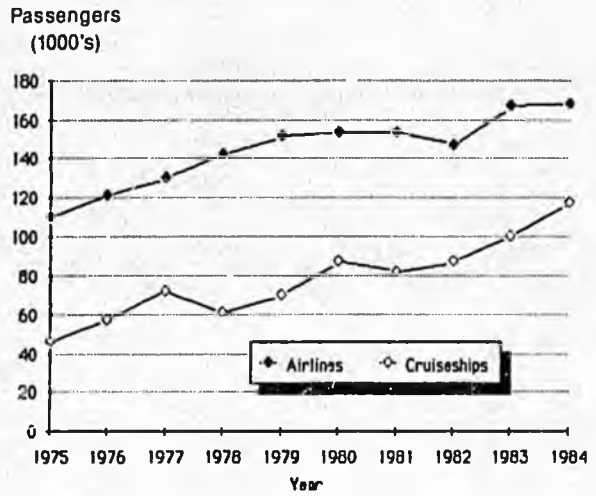
Tourism Today

Southeast Alaska played host to 205,000 total visitors in 1983, double the number in 1975. The primary reason for the industry's expansion has been the dramatic increase in cruiseship visitation (see fig. 2.6). Two other significant forms of access into Southeast are commercial airlines and the State ferry system. Commercial air traffic increased at a steady 8-10 percent rate through the 1970's, but has leveled off somewhat during the past 5 years (fig. 2.6). Use

Map 2.2—**Changes in Recreational Use Patterns Since ANILCA**

Figure 2.6

Cruiseship and Airline Traffic Trends, 1975–84



of the Alaska State ferry system has increased approximately 33 percent in the last 10 years.

Cruiseship and Marine Highway passengers are users of the Forest as they enjoy the scenery of the Inside Passage and engage in "onsite" uses of the Forest. The recent emergence of short-duration adventure activities such as raft trips down the Mendenhall River, glacier walks, and scenic overflights, reflects the increased demand for onsite recreational experiences.

Other examples of trends toward increased use are reflected in the number of outfitter/guide permits issued for use on the National Forest over the last 10 years. In 1976, 6 permits were issued; in 1980 the number increased to 17, and by 1984, 52 permits had been issued.

Local residential recreation use has also gradually increased with the growth in the region's population. An annual survey of Alaska resident sport fishermen indicated that the number of resident sport fishermen in Southeast Alaska increased some 55 percent, from 20,387 to 31,674, between 1977 and 1983. The region's population grew by only 27 percent over this same time period. In 1983 the survey found that the three most important attributes to a quality angling experience were (1) uncrowded environment, (2) wilderness setting, and (3) catching lots of fish. These results confirm earlier findings from the 1979 Alaska Public Survey, a joint State and Federal study of resident recreation in Southeast Alaska. Many of the

The Island Princess, one of the many tour ships that cruise the Inland Passage during the summer months.

region's most popular fishing sites are located on or adjacent to the National Forest.

This growth in visitation has stimulated an expansion of the tourism industry. A study of the tourism industry by the Alaska Division of Tourism and Alaska Department of Labor found that statewide the industry received approximately $940 million in total sales during 1982. Of this, $550 million was directly attributed to nonresident visitors. The remaining $390 million was attributed to in-state travelers and local residents. These sales, in turn, provided employment for slightly more than 16,000 people. Statewide, the study concluded, the visitor industry was the fourth largest private sector. While tourism is an important industry in Southeast Alaska, it is not clear how it ranks relative to other private sectors since a similar analysis of the visitor industry in Southeast Alaska has not been conducted.

Pre- and Post-ANILCA Locational Patterns of Use

A commonly held perception is that formal Congressional designation of a previously unclassified area as "Wilderness" or "National Park" automatically results in significant increases in recreational use. This phenomenon is termed the "designation effect." The stimuli for such increases are theorized to be the promotional benefits of having a nationally recognized designation.

Since ANILCA designated over 5.4 million acres as Wilderness, the impacts of a "designation effect" in Southeast Alaska could be substantial. Analysis of pre- and post-ANILCA recreational use patterns was viewed as one way of testing this hypothesis.

Access to many recreational areas in Southeast Alaska requires some form of commercial transportation (boat, airplane). Commercial recreation transportation activities were therefore considered an important indicator of recreational use in the region by both residents and nonresidents. Map 2.2 highlights cruiseship routes and areas of increased use both inside and outside of formal Wilderness since ANILCA.

Forest-wide, estimated fiscal year 1984 recreational use in the Tongass National Forest Wildernesses was 250,000 recreation visitor-days. Approximately 40 percent of this use was concentrated along the coastal portions of the Wilderness areas. The majority of the remaining upland use is related to scenic overflights and use of the 47 public recreation cabins located within these Wildernesses. Due to the dispersed use patterns and generally low use levels in Southeast Alaska it is difficult to quantify site-specific recreation use, particularly for dispersed activities such as hiking, boating, fishing, and hunting. Additionally, the collection of quantified use data when compared to other recreation management needs is not a priority in light of limited recreation budgets.

The following discussion summarizes some of the major area-specific patterns which have evolved. Comparisons are made relative to general use statistics as well as the presence of attractions, services, and relative accessibility.

Misty Fiords National Monument and Wilderness is, perhaps, the best example of a "designation effect" in Southeast Alaska. Use of the area has increased dramatically since ANILCA. In 1979 only one small (less than 200-passenger capacity) part-time vessel operated out of Ketchikan on an "as demanded" basis. By 1984 six small and two large (over 200-passenger capacity) vessels operated scheduled trips into the Misty Fiords area. The most dramatic increase, however, has been in scenic overflights. The number of scenic-flight passengers grew from approximately 300 in 1979 to some 7,000 in 1984 (fig. 2.7). In addition to cruiseship use, kayaking and canoeing have also increased in Misty Fiords, although actual numbers are still small. The timing of these changes is an important indicator of a designation effect. The dramatic jump in use at Misty Fiords occurred during and immediately following designation (1980–81), while use in surrounding non-Wilderness areas grew at a much slower pace. The attractions needed to promote Misty Fiords were already available locally before the area's designation. For example, access, marketing skills, and visitor services and facilities were all available in Ketchikan, but these factors by themselves were not enough to cause the rapid increase in use after 1980.

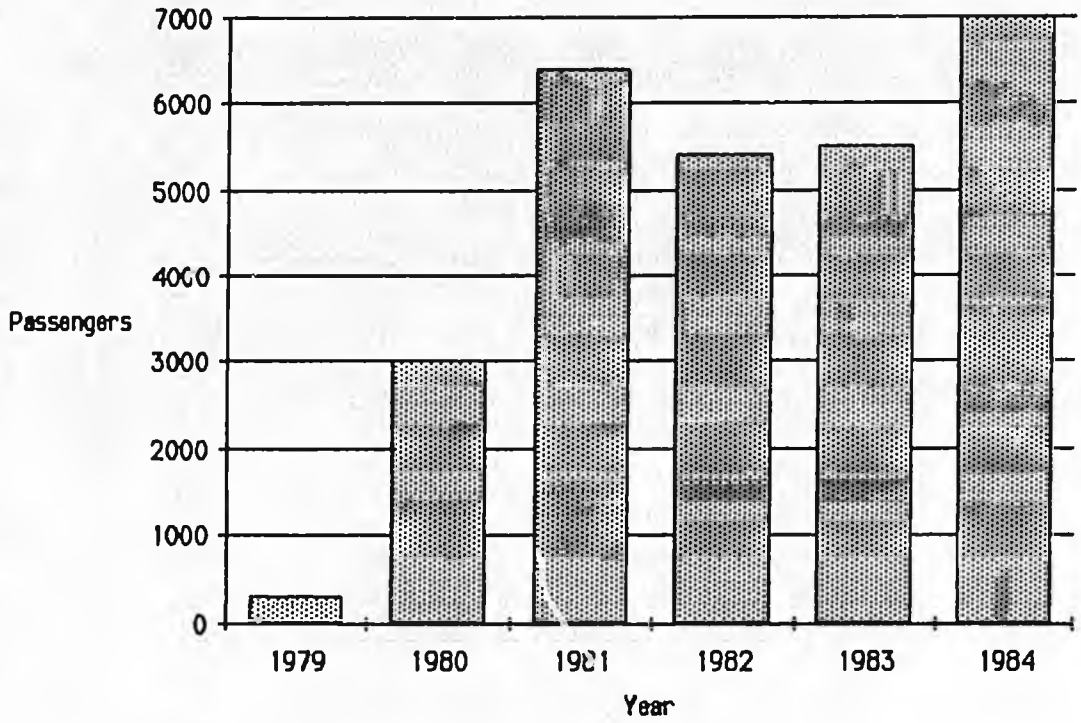
Like Misty Fiords, Tracy Arm–Fords Terror, Admiralty Island, and Stikine–LeConte Wildernesses, have experienced increases in use since ANILCA. Although the increases have not been as significant as Misty Fiords they are considered to be above average when compared to Southeast Alaska as a whole.

Smaller cruise ships have contributed significantly to the increased use of Admiralty and Tracy Arm–Fords Terror since ANILCA. The development of light-weight, high-powered outboard engines has played a major role in the growth of traffic on the Stikine River. Other factors affecting use of Stikine–LeConte include research projects along the corridor planning for the proposed Stikine hydroelectric project in British Columbia, and development on the Canadian side of the border.

West Chichagof-Yakobi, South Baranof, Petersburg Creek–Duncan Salt Chuck, and Russell Fiord Wildernesses appear to have experienced increased recreation use at a rate very similar to overall use in Southeast Alaska. Depending on marketing skills, demand for solitude, and availability of access, either commer-

Figure 2.7

Scenic Flight Passenger Numbers[a] in the Misty Fiords and Ketchikan Area



[a]Rounded to the nearest hundred.

Source: Interviews with area tour operators, Forest Service RIM data, and information from the Southeast Stevedoring Corporation.

cially or noncommercially, the potential for increased use for these areas is possible. The areas are reasonably close to established communities and relatively accessible, although not to the same degree as, say, Misty Fiords or Admiralty Island. Designation could become a very important marketing tool for these areas in the future.

Tebenkof Bay, Endicott River, Coronation Island, Warren Island, Maurelle Islands, and South Prince of Wales, due to their relative inaccessibility and distance from communities, have not experienced similar increases in recreation use compared to the other Wilderness areas. The development of additional access or improved information could modify this situation, particularly for an area like Tebenkof Bay which provides protected waters and secluded anchorages.

Increases in recreation use on the Tongass National Forest are not limited to Wilderness areas. On Prince of Wales Island recreation has grown with the expansion of the road system. Much of this visitation involves the use of recreational vehicles. There are only limited opportunities for recreational vehicle use throughout the rest of Southeast. Other forms of tourism have also increased on Prince of Wales, the most significant being sport fishing. A new fishing lodge, Waterfall Resort, was recently completed on the island. Although the lodge is accessible only by air or water, it hosted approximately 1,200 guests during the 1984 season. Other lodges and motels on the island have experienced increases in use over the past 5 years.

In contrast to the economic benefits generally associated with increased use of Wilderness, some operators and visitors feel this use has resulted in the loss of Wilderness values. This is particularly true in Misty Fiords. Over the past 5 years, the Forest Service has received an increasing number of complaints about aircraft noise in the Big Goat Lake cabin area. The cabin is located on a high alpine lake and lies directly along the path of the Misty Fiords flightseeing tour. As a result, many users believe the cabin site no longer offers the Wilderness solitude it once did during the summer months.

[8]Morck, Vicki; Pacific Northwest Forest & Range Experiment Station.

The development of recreation "hot spots" over the past several years has also created special management problems for both the Forest Service and other agencies such as the Alaska Department of Fish and Game. One example is Pack Creek on Admiralty Island. Here the problems primarily involve the increasing number of encounters between brown bear and human visitors.

Promotional Efforts Within the Industry

Travel advertisements generally reflect the kinds of activities that visitors to an area are demanding. The degree to which the image of Alaska's Wilderness areas has been marketed was evaluated by analyzing the content of tourism advertisement over the past 10 years to see if any trends had evolved since the formal creation of Wilderness.[8] Using location key words, it was found that many of the areas designated as Wilderness in 1980 were promoted to a greater extent after their designation (fig. 2.8). The Misty Fiords, Stikine-LeConte, West Chichagof, and Russell Fiord areas were all included in advertisements for the first time after 1980. The Tracy Arm area was consistently found in promotions prior to 1980, but at a higher frequency after 1980. In addition, the State Division of Tourism in its visitor marketing campaign has capitalized on the wilderness image. This image has been enhanced by the approximately 57 million acres of Wilderness designated in ANILCA. During the last 4 years, the Division of Tourism has emphasized a more personal experience touched by the natural scenic beauty of Alaska. In part, this was in response to a marketing survey which indicated that "scenery, forest, mountains, out of doors," and "wilderness, unspoiled, rugged" were the two top categories that visitors found most appealing about Alaska as a vacation area.

The current trend in both State and private industry advertisements continues to capitalize on the scenic splendor of the State, particularly Southeast. Approximately $30 million was spent marketing the Alaska "image" in 1984. This included $7 million from the Division of Tourism, and $1 million from the Alaska Visitors Association Marketing Council as part of a cooperative marketing program designed to promote a generic "Alaska." The remaining $22 million was provided by the private sector, the majority coming from the cruiseship industry. Several visitor marketing consultants estimated that some $10 million was spent promoting the Inside Passage of Southeast Alaska in 1984.

It appears likely that the promotion of Wilderness will eventually result in increased use in many of the Wilderness areas in Southeast, despite the evidence that such an increase has not yet occurred on a large scale. Recent research on the effects of Wilderness designation on use patterns[9] indicates there may be a lag period between the time of designation and when "word gets out" concerning a particular area. Recent increases in the number of cruiseships using Wilderness areas is a good indicator that this may be the case in Alaska. Additionally, the growing number of Forest Service-administered outfitter/guide permits indicates that demand for permitted visitor service operations in Wilderness areas on the Tongass National Forest is continuing to grow.

Operator Perceptions of Wilderness Designation

Another indicator of the effects of Wilderness designations on the tourism industry is what tour operators perceive to be the impact. Of the 64 tour operators interviewed, the majority (73 percent) saw the formal creation of Wilderness as a means of protecting the resource their businesses need to grow. Natural attractions were seen as the primary basis behind much of the tourism industry in Southeast Alaska. They viewed the long-term growth and security of their firms as dependent upon the way in which the natural character of the landscape, both inside and outside of Wilderness, is managed. The operators also indicated that national designation benefited their businesses in terms of marketing and advertising.

The respondents who cited negative impacts (5 percent) felt that Forest Service policies for managing Wilderness in an unaltered state hampered the development of lodges and other facilities, and thereby limited opportunities for growth in their businesses. This response reflects the importance of managing for primitive recreation opportunities in nonclassified areas as well, where facility development is permitted and more appropriate than in formally classified Wilderness.

Summary

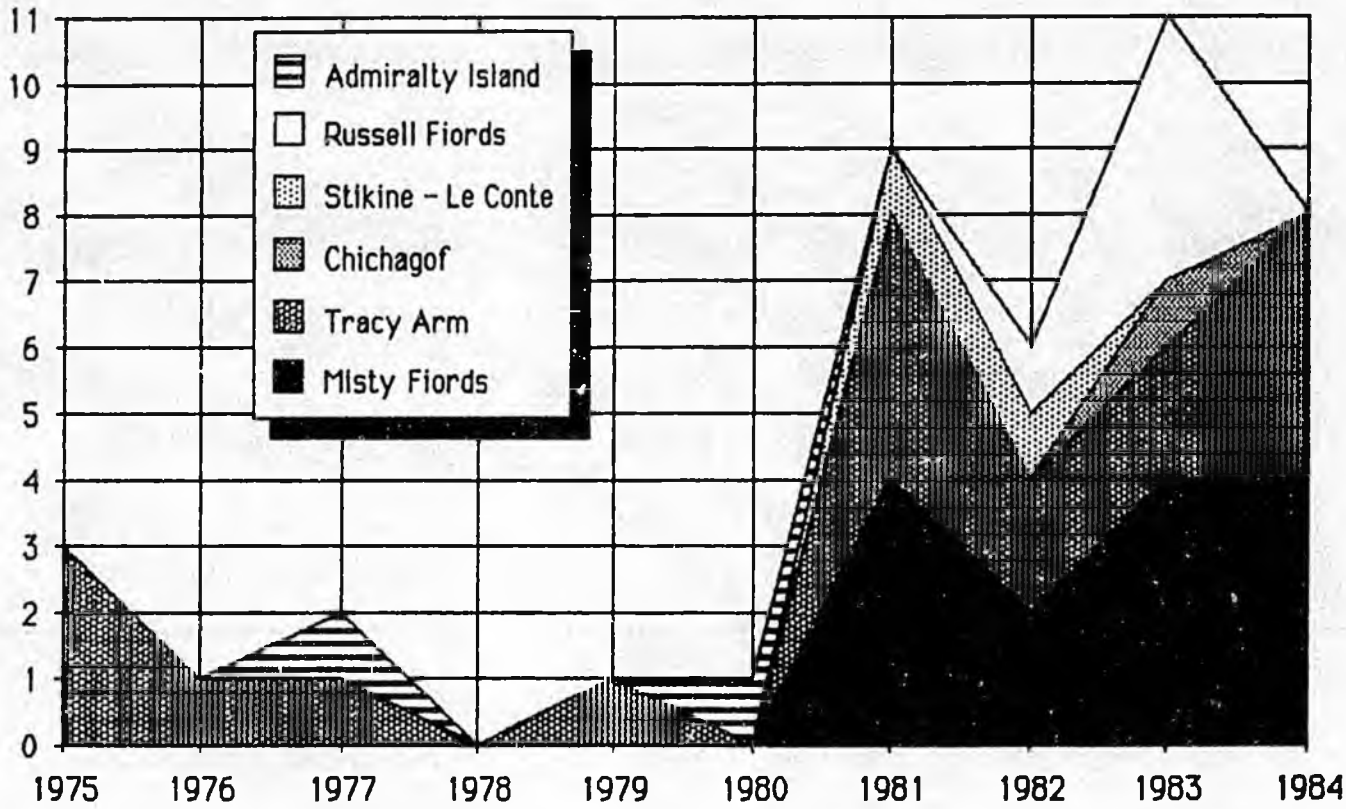
Three indicators have been instrumental in measuring the impact of Wilderness designation on the tourism industry of Southeast Alaska: use patterns before and after designation, promotional trends within the industry, and operator perceptions of impacts.

The analysis of use patterns identified Misty Fiords National Monument Wilderness as the primary example of where national designation appears to have had a strong influence on actual levels and patterns of use.

[9]McCool, Stephen. "Does Wilderness Designation Lead to Increased Recreation Use?" *Journal of Forestry.* Vol. 83, No. 1, January 1985, p. 39-41.

Figure 2.8

Number of Wilderness Area Referrals in Travel Advertisement, Pre- and Post-ANILCA



ANILCA Wilderness designations have also significantly influenced promotional trends. This indicator suggests that Wilderness designations are having a positive influence on the tourism industry. Survey responses, tour brochures, and travel advertisements all indicate that the tourism industry is selling, or "exporting," the scenic beauty and unspoiled wilderness of Alaska.

The majority (73 percent) of the Southeast tour operators interviewed believed that the Wilderness designations had positively impacted their business for two reasons: the national designation aids them in advertising campaigns; and the designations protect the scenic, undeveloped landscape they need for future operations (business growth and stability).

It is difficult to accurately predict future recreation and tourism demand for the 14 Wilderness areas classified by ANILCA. If the conditions are right—unique attractions, accessibility, visitor services and promotional skills—then a continued increase in use can be expected. Those areas with unique attractions, opportunities, or improved access can expect to realize more significant increases than those without these characteristics.

Wilderness is managed to provide unique forms of primitive recreational opportunities that are essentially independent of man-made facilities except those necessary for human health and safety. As such, Wilderness areas cannot be expected to meet the demands for all forms of recreation. There are lands outside of designated Wilderness that provide environments which offer recreational opportunities similar to those within designated areas. In other areas, such as Prince of Wales Island, where access exists as a result of resource development activities, other forms of recreation are more appropriate. Activities such as roadside camping, downhill skiing, visiting resorts, and driving for pleasure are only possible on lands not included within the Wilderness Preservation System.

Since ANILCA, the tourism industry has steadily grown in Southeast Alaska as a result of marketing techniques that emphasize the unique natural characteristics of the area. During this period, 35 new out-

fitting and guide permits were issued to businesses directly dependent on the National Forests for their operations. In addition, several other businesses or corporations have been established or expanded. Tourism, fisheries, and timber continue to be the most important natural resource-dependent industries in Southeast Alaska, and have been roughly equivalent in their importance to Southeast Alaska economy in terms of employment and earnings, varying in relation to each other based on prevailing market conditions. Since 1980 the tourism industry has steadily grown, and in 1984 surpassed both fisheries and timber in terms of the total number of jobs (direct and indirect/induced). Total earnings in tourism, while less than the other two sectors, have grown at a fairly consistent rate. Given the current marketing emphasis, tourism is likely to continue to grow in importance to the region's economy.

Alaska Department of Fish and Game.

Sitka black-tailed deer.

Chapter 3

Measures Instituted by the Forest Service to Protect Wildlife and Fisheries in the Tongass National Forest

This chapter provides a description of how policies to protect fish and wildlife resources were developed and are currently being implemented on the Tongass. A summary is presented of ongoing research and management programs concerning habitat relationships and fish and wildlife use. A description of habitat capabilities and wildlife use in Wilderness areas relative to the entire Forest also is presented.

This chapter summarizes measures taken by the Forest Service to provide for protection of fish and wildlife resources, and to accomplish wildlife and fish management objectives on the Tongass National Forest. Included are brief descriptions of the fish and wildlife resources of the Tongass; the fisheries and wildlife planning efforts; the many cooperative efforts undertaken by numerous Federal, State, and local government agencies, interest groups, and individuals; the fisheries habitat enhancement program; the second-growth management program; and the wildlife and fisheries habitat relationship program.

THE FISH AND WILDLIFE RESOURCES OF THE TONGASS NATIONAL FOREST

The Tongass National Forest supports a wide variety of fish and wildlife species. Over 400 species of wildlife, fish, and shellfish use the aquatic and terrestrial habitats of the Tongass. These species provide many opportunities for consumptive and nonconsumptive use by the public, including commercial, sport, subsistence, and photographic and viewing activities. The Forest is rich in its varied and unique species. Some of the species found on the Tongass in abundance are threatened or endangered in other parts of the United States.

The bald eagle is such a species. Although threatened or endangered in other parts of the country, the bald eagle thrives in Southeast Alaska's coastal forests, with an estimated population of 10,000 birds. Indeed, the Tongass supports the largest population of breeding bald eagles in the world. This large population of eagles on the Tongass draws local, regional, and national attention.

The hunting of moose, brown and black bears, mountain goats, and especially deer is popular. Over the last five years, hunting seasons for most of these game species on the Tongass have remained constant or slightly increased in duration. The most popular game animal is the Sitka black-tailed deer, found throughout the forested areas of the Tongass. The deer provides recreational and subsistence hunting opportunities for numerous Alaskans.

In response to increased public demand for deer, the State of Alaska has established appropriate hunting seasons and bag limits to meet this demand. The number of deer harvested by hunters has steadily increased from 4,800 deer in 1980 to 12,100 deer in 1984. This increase in annual harvest is attributable to several factors, including more hunters, better hunter survey techniques and harvest estimates, and increased deer populations resulting from favorable overwinter survival.

State regulations effective July 1, 1985–June 30, 1986 include the following provisions for hunting deer in Southeast Alaska, which includes the Tongass National Forest:

State game unit	Forest/Area	Season	Bag limit
1(c),4	Chatham	8/1–12/31	4 deer
		1/1–1/31	2 deer
1(b),3	Stikine	8/1–11/30	1–2 deer
1(a),2	Ketchikan	8/1–11/31	3 deer

Because population estimates for deer and most other wildlife species do not presently exist, population management is based upon data collected from hunter success and other trend information, and the professional judgement of biologists.

The Tongass National Forest also supports many nongame species that are used, enjoyed, and desired by the public. Numerous species of furbearers, waterfowl, upland game birds, and small game provide the public with ample opportunity for sport, com-

mercial, and subsistence uses. Demand for all species is increasing as nonconsumptive uses, such as wildlife watching and photography, gain in popularity.

Five species of Pacific salmon, along with other anadromous fish, use the abundant freshwater resources of the Tongass as spawning and rearing areas. The returning salmon provide a wide variety of recreational, subsistence, and commercial opportunities. Indeed, the salmon production from the Tongass represents the bulk of the natural production in the southeast region.

There are no resident threatened or endangered terrestrial wildlife species in Southeast Alaska. However, the American peregrine falcon (*Falco peregrinus anatum*) may occasionally migrate over the Forest. The Prince of Wales flying squirrel (*Glaucomys sabrinus grisefrons*), a resident of the Tongass National Forest, has been identified by the Fish and Wildlife Service as a candidate for Federal listing. Another candidate species, the Glacier Bay water shrew (*Sorex alaskanus*), is thought to occur on lands contiguous with the Tongass and may also be a resident of the Forest. The Forest Service considers the habitat needs of these species in planning and management activities.

To meet these diverse demands for wildlife and fish resources, the Tongass National Forest is managed in a manner that maintains a sustained, even flow of quality habitats for the full diversity of species. The protective measures described in this chapter emphasize the special habitat needs of deer, eagles, anadromous fish, and other high-interest species while providing for a diverse mix of habitats, species, and uses of wildlife and fish resources.

WILDLIFE AND FISHERIES MANAGEMENT PLANNING ON THE TONGASS NATIONAL FOREST

The Southeast Alaska Area Guide (1977) provided the first comprehensive policies to protect wildlife and fish resources on the Tongass National Forest. The majority of these policies were subsequently refined and incorporated into the Alaska Regional Guide in 1983. The Guide provides the standards by which management activities are to be carried out. These standards stress the full protection of the biological potential of fish and wildlife habitat. The Tongass Land Management Plan (TLMP), for its part, provides the overall direction for management of all resources on the Forest, including fisheries and wildlife. The Forest Plan, which was finalized in 1979, uses the concept of emphasis species to ensure that the habitat requirements of wildlife and fish are considered in planning and management activities, and to ensure the viability of all species.

Alaska Department of Fish and Game.
Salmon return each year to spawn in the numerous streams of Southeast Alaska.

The passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 confirmed the long-standing commitment to fisheries enhancement on the Tongass National Forest. Since 1952, more than 200 cooperative habitat enhancement projects have been completed. ANILCA instituted additional cooperative fisheries planning incorporating State of Alaska salmon planning into the Forest's fisheries enhancement planning process. Special Wilderness management provisions in ANILCA permit fish habitat manipulation and construction of structural improvements in Tongass Wilderness areas.

Under ANILCA, 85 of 298 high-value wildlife habitat areas and 26 of 490 high-value fisheries habitat areas identified in the Forest Plan were included in designated Wilderness. In addition, 35 high-value wildlife habitat areas and 220 high-value fish habitat areas are included in areas designated in the Forest Plan for unroaded, primitive recreation management. Therefore, as a result of the Forest Plan and ANILCA designations, approximately 40 percent of the high-value wildlife habitat areas and 50 percent of the high-value fisheries habitat areas are included in unroaded areas.

The Forest Plan also contained provisions for flexibility in meeting new demands upon the resources of the Forest. In 1983, the Alaska Department of Fish and Game requested that an additional 72 high-value wildlife and fish habitat areas be deferred from timber harvest until the Forest Plan was revised. Consideration was given to this request during the amendment of the Forest Plan in 1985. Where program flexibility permitted, scheduling of timber harvesting was deferred in 49 of the high-value areas until the next periodic review of management activities. Additional consideration is being given to the

Department's request in ongoing project activities evaluated through the NEPA process, such as the 5-year operating plans for the long-term timber sale contracts.

PLANNING AT THE FOREST LEVEL IN RESPONSE TO WILDLIFE AND FISHERIES ISSUES

While the Alaska Regional Guide provides the standards by which management activities are carried out, it is the Forest Plan that describes the management direction. The Forest Plan provides management direction for the protection, maintenance, and enhancement of wildlife and fisheries. This direction includes (1) providing for four different land use designations, (2) retaining important forest fish and wildlife habitat, and (3) instituting the concept of wildlife and fish habitat management units. Forest-level wildlife and fisheries management objectives are accomplished through implementation of these planning provisions.

A description of how these planning provisions are related to the fish and wildlife resource on the Tongass may be useful.

Land Use Designation

Land use designations[1] (LUD) were used in the Forest Plan to provide a range of management opportunities for all resources. Protective measures for wildlife and fisheries resources were set in the management direction for each alternative considered in the Forest Plan and ranged from recommended Wilderness or primitive, nonmotorized area management to varying degrees of resource development. Wildlife and fisheries habitat enhancement was permitted in all land use designations except recommended Wilderness, where enhancement activities were limited to reflect the requirements of the 1964 Wilderness Act.

Under the Forest Plan, 17 areas were recommended for Wilderness (Land Use Designation I). Congress, through ANILCA, formally designated 14 areas on the Tongass as Wilderness. These Wilderness areas are well dispersed throughout the Forest and represent the variety of wildlife habitats present in Southeast Alaska. The areas range in size from the 4,937-acre Maurelle Islands Wilderness to the 2,142,243-acre Misty Fiords National Monument Wilderness.

Congress recognized that to meet the wildlife and fisheries objectives in the Forest Plan, habitats in both Wilderness and non-Wilderness must be managed. To this end, special management provisions peculiar to ANILCA modified 1964 Wilderness Act provisions to provide for fisheries enhancement not permitted under the pre-ANILCA Wilderness recommendations. ANILCA also provided for the continuation of traditional and customary subsistence uses of wildlife in Wilderness. Further clarification of the role the Forest Service should play in managing the wildlife and fisheries resources of the Wilderness areas is provided by the Wilderness Act of 1964 and subsequent Forest Service management direction.

Although Wilderness provides some of the more productive wildlife habitats in Southeast Alaska, these areas do not meet all the public demand for wildlife resources. The remoteness of the areas poses limitations on the use of the Wilderness by wildlife users. There also exists highly productive wildlife habitat on the Forest outside the designated Wilderness areas.

A major benefit that Wilderness areas provide for wildlife management is to serve as a natural benchmark or check area. This allows comparison of conditions in a natural state with those altered through other human activities. Populations of native animals and plants in their natural setting in the 14 Wilderness areas provide excellent benchmarks of habitat to compare with non-Wilderness settings.

While benefitting fisheries and wildlife, Wilderness designation also restricts the management of these resources to some degree. Management of wildlife and fish habitat in these Wilderness areas, for example, is affected to the degree that habitat manipulation is restricted. While normal hunting seasons and bag limits are authorized in Wilderness areas, predator control projects in these areas are normally prohibited. Selective control of predators may be authorized to protect humans from health hazards when animals are known carriers of disease, or when they are considered to be jeopardizing threatened or endangered species.

Land use designations, working within the modifications called for under ANILCA, have provided a basis upon which the wildlife and fisheries resources of the Tongass, both Wilderness and non-Wilderness, are to be managed. The management objectives for wildlife and fisheries that were accomplished through land use designations are summarized below.

[1] A process used in the Tongass Land Management Plan to describe the broad purpose of management for each area of the National Forest, and establish specific management constraints. Prescribed management for the four land use designations in the Tongass Land Management Plan ranged from recommended Wilderness to intensive timber and other resource development.

Old-growth forest on the Tongass National Forest.

Wildlife

The application of land use designations placed 40 percent of identified high-value wildlife habitat areas of the Tongass under recommended Wilderness or primitive nonmotorized area management. The remaining 60 percent of the high-value habitat areas is subject to varying degrees of modification from timber harvest or other resource development. Wilderness and primitive nonmotorized management designations provide direct benefit to some wildlife species through maintenance of existing habitat conditions, which assures continued production of wildlife and fish resources within a wilderness setting. Varying degrees of habitat modification are planned on the remainder of the Forest.

An illustration of how land use designation is aiding in the protection of wildlife habitat is shown in figure 3.1. This figure compares identified deer winter habitat[2] on the Tongass National Forest at the time of Forest Plan implementation (1979), in 1984, and that projected to remain unharvested at the end of the planned rotation (2079).

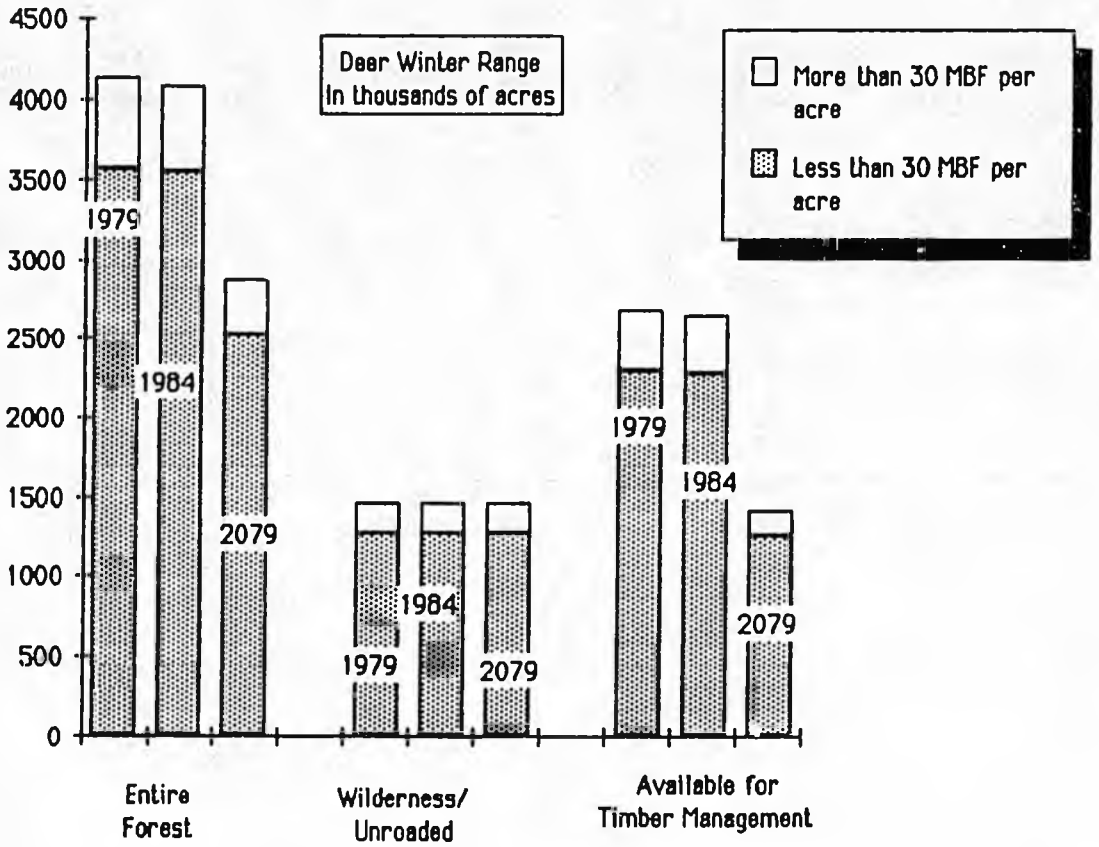
Although lower-volume and second-growth stands may provide winter habitat for deer in some locations, features important for deer winter habitat are most often found in certain stands supporting timber volumes greater than 30,000 board feet per acre. Additional investigations by the Alaska Department of Fish and Game and the Forest Service indicate the Forest Plan definition may be too restrictive and future adjustments in the definition may be appropriate.

As shown in figure 3.1, of the total 4,146,400 acres of deer winter habitat identified on the entire Tongass National Forest (including areas now designated Wilderness) in 1979, about 2,873,300 acres (69 percent) are estimated to remain unharvested at the end of the timber harvest rotation in 2079. Of that portion of the Forest currently available for timber harvest, about 2 percent (46,971 acres) of the identified deer winter habitat has been harvested to date. Harvest has included 5 percent (20,500 acres) of the winter habitat located in timber stands of greater than 30,000 board feet per acre. It is important to note that these projections are based on the current resource management planning direction in the Forest Plan. Future modifications of the Forest Plan direction made in accordance with NFMA and

[2]As used in the development of the Forest Plan, key deer winter habitat is included in the area from the beach fringe to 500 feet elevation or generally one-fourth mile inland from the shoreline.

Figure 3.1

Distribution of Old-Growth Deer Winter Range on the Tongass National Forest in 1979, 1984, and Projected to Remain Unharvested at the End of the Planned Rotation (2079)



[a]Tongass Land Management Plan Land Use Designations I and II.
[b]Tongass Land Management Plan Land Use Designations III and IV.
Note: These projections are based on the current resource management planning direction i he Forest Plan. Any future modifications in Forest Plan direction will necessitate revision of these projections.

NEPA regulations may necessitate revision of these projections.

Deer winter habitat in Wilderness and unroaded, primitive recreation areas (Land Use Designation II) of the Forest will remain unchanged based on current land use designations.

Understanding the deer habitat relationship is complicated by other factors such as the differences in severity of winters, time needed for a deer population to recover from a decline, effects of predation from wolves, microclimate differences, elevation, and slope and aspect of habitat terrain. In some areas, for example, a decrease in key winter habitat may cause increased concentration of use by deer in the remaining winter habitat and thus decrease carrying capacity. Such concentrations may also lead to an increase in predation success on deer by wolves. These and other factors are under ongoing studies and evaluation, and new information will be integrated into planning and management activities as it becomes available.

Fisheries

Land use designations and management guidelines have aided managers in providing for the protection

of wildlife and fish resources on the Forest. The Forest Plan placed in Wilderness or unroaded areas 63 percent (12 of 19) of the "High Quality Watersheds" representing 265,698 acres[3] and 60 percent (36 of 60) of the "Important Watersheds" representing 1,082,677 acres.[4] These areas were identified by the Alaska Department of Fish and Game at the time of Forest Plan development.

Wilderness and unroaded primitive recreation area designations will maintain a variety of natural habitat conditions for wildlife and fisheries over approximately 48 percent (8.2 million acres) of the Forest. The Forest Plan also provides for site-specific direction, called management prescriptions, to adequately protect fisheries habitat in the remaining areas of the Forest scheduled for timber harvest and other resource development. Fisheries habitats are being maintained and, when possible, enhanced throughout the Forest.

Retention of Important Wildlife and Fish Habitat Features in Commercial Forest Lands Planned for Timber Harvest

During development of the Forest Plan, the Forest Service recognized that special management prescriptions would be needed to maintain existing habitat conditions for certain wildlife and fisheries species on commercial forest land planned for timber harvest. To meet this need, the Forest Plan estimated the acreage (273,000 acres) that would have to be removed from the timber base to maintain existing habitat conditions. The method by which these acres are withdrawn is referred to as the "retention" process. Associated prescriptions in areas scheduled for timber harvest may range from no harvest to the harvest of a percentage of the timber volume within these areas. Site-specific acreage is to be withdrawn from a timber sale area to protect specific habitat identified during the analysis process for a given timber sale. That is, the acreage is removed from harvest consideration for the expressed purpose of maintaining or enhancing fish and/or wildlife.

The process for translating the Forest Plan's retention provisions into specific direction for use in the field has been developed by each of the Tongass National Forest Administrative Areas. Although the wildlife and fisheries retention provisions have not been applied consistently across the Tongass, procedures to clarify and standardize the process for the remainder of the planning period have recently been developed for the entire Forest and are included in the amended Forest Plan.

Because the acres available to be retained in the Forest Plan were based upon an estimate, the actual amount of habitat that will be retained will not be known until area analysis and project planning are completed. The analysis to determine the number of acres of existing habitat to be retained for a given area will be based upon population objectives pertinent to the analysis or project area. For example, one of the more important criteria used in establishing habitat management goals is based upon expected demand for wildlife. Should it be determined in the analysis that more deer habitat would be needed in a specific management area to meet hunting or subsistence demand, then portions of the area that provide necessary habitat would be removed from harvest consideration. It should be noted that any prescription for wildlife and fish which precludes timber harvesting in an area is considered to be included in the retention acreage provided for in the Forest Plan.

To date, as part of the timber sale planning process, approximately 32 percent (87,846 acres) of the 273,000 acres estimated in the Forest Plan has been identified and documented as important habitat to be excluded from timber harvest. Additional acreages to be retained will be identified as areas of the Forest are scheduled for future timber harvest.

In addition to the 273,000 acres slated for wildlife and fisheries retention, 244,000 acres are to be maintained over extended (120- and 200-year) rotations for maintenance and enhancement of visual resource. These extended rotation acreages, in most cases, also provide benefits for wildlife and fish habitat.

Wildlife and Fish Habitat Management Units

Another key provision of the Forest Plan was direction to utilize Wildlife and Fish Habitat Management Units. These habitat management units are delineated in conjunction with timber harvest activities to identify specific habitat features that are considered important to the management of wildlife and fish populations in the harvest areas. Specific management prescriptions are applied to these areas to maintain or enhance habitat condition. The habitat management unit concept is not yet fully implemented on all areas of the Tongass.

Each of the Tongass National Forest Administrative Areas has developed different processes to identify site-specific wildlife and fish habitat management units. The Forest Plan amendment released in December 1985 provides specific direction to standardize the processes among the administrative areas,

[3]Stream systems having high-quality sport fishing value were identified by the Sport Fish Division of the Alaska Department of Fish and Game, using biological characteristics.

[4]Stream systems having important commercial, recreational, and subsistence fishery values were identified by the Sport Fish Division of the Alaska Department of Fish and Game, using biological characteristics.

and provides for more consistent application and implementation.

Delineation of wildlife and fish habitat management units and the management prescriptions for the areas they contain are developed through the interaction of a number of natural resource disciplines. All management activities, such as timber harvesting, must be integrated and a consistent strategy developed to ensure the selected management objectives are achieved within the management unit.

For wildlife, the prescriptions may address forest management practices that affect wildlife habitat, including size, shape, dispersal of cutting units, silvicultural systems, and multiple entries into stands during the 100-year rotation. Prescriptions in fish habitat management units may include road and harvest unit location; location of bridges and culverts requiring fish passage; identification of appropriate sites for stream crossings; measures required to minimize sediment entry into the stream channel in areas with steep slopes and/or erodible soils; protection for temperature-sensitive streams; streamside management to maintain continued long-term introduction of instream large woody debris; and habitat enhancement.

Examples where habitat management units have been used include Naukati Bay and Shaheen Creeks on Prince of Wales Island, Straight Creek on Kuiu Island, Falls Creek on Mitkof Island, and Mud Bay and Neka Rivers on Chichagof Island.

Monitoring Activities

Monitoring programs are carried out on several locations on the Tongass to assess the effectiveness of the management prescriptions in meeting wildlife and fisheries habitat management objectives. Monitoring also serves as a means of identifying necessary changes in these prescriptions. An evaluation of 215 miles of road on the Stikine Area in 1985 represents an example of such monitoring activities. The evaluation was conducted to determine effectiveness of maintaining fish passage at stream crossings. The findings indicated that very little habitat loss was associated with the road construction and all 197 stream crossing structures (*i.e.,* bridges and culverts) were working as designed.

Since 1980, the Tongass National Forest has spent approximately $1 million on U.S. Geological Survey operation of hydrologic gauging stations to measure water quantity and/or quality. Additionally, the Forest Service has been collecting water quality samples at stations throughout the Tongass National Forest. Data from these stations has been used to define baseline water quality and to assess long-term impacts of management activities on water quality.

The Forest Service has also undertaken three studies to analyze short-term impact on water quality from timber harvest-related activities. In the Kadashan drainage, stations on three small streams have been gauged to determine changes in water quality from road construction. Studies in the Indian River (near Tenakee Springs) and Fools Creek (near Wrangell) drainage basins were done to evaluate the effects of roading and logging on the natural sediment patterns.

Besides specific monitoring studies of this type, periodic formal Forest Service program and activity administrative reviews provide a continuing monitoring and evaluation process. These reviews result in action plans to resolve program and project level deficiencies in meeting Forest Plan resource management objectives.

COOPERATIVE ACTIVITIES

While planning is an essential part of all sound management, it is not possible to carry out the goals of any plan without the cooperation of many other Federal, State, and local agencies, interest groups, and individuals. The management of the Tongass has involved many such groups.

The Forest Service, other Federal and State agencies, private land managers, and public interest groups are working cooperatively to provide, through research and management pursuits, wildlife and fish habitat information for the Tongass. The objective of these cooperative ventures is to assist Forest land managers in maintaining the productivity and abundance of wildlife and fish resources on the Forest in a manner that is consistent with the intent of the Forest Plan. Major cooperative activities that have effectively contributed to management of wildlife and fisheries on the Forest are summarized below.

Alaska Working Group on Cooperative Forestry–Fisheries Research

In 1982, the Alaska Working Group on Cooperative Forestry–Fisheries Research was formed as a result of a recommendation made at the annual meeting between the National Marine Fisheries Service and the Forest Service. The working group operates as an advisory body for communicating between member agencies. The working group charter lists 11 functions dealing with interagency research coordination, planning, and cooperation. These functions include identifying research needs and priorities; reviewing and recommending plans for sharing manpower, facilities, equipment, and logistics; and coordinating research with matters related to timber management.

The working group research priorities are:

1. Developing a scientific basis for managing streamside areas relative to stream habitat and salmonid production.
2. Minimizing impact of log transfer facilities on the marine environment by developing improved siting criteria and rehabilitation techniques.
3. Preparing guidelines for land managers, including measures to protect and improve fish habitat in relation to priorities 1 and 2.

The member agencies of the working group include: (1) U.S. Fish and Wildlife Service; (2) National Marine Fisheries Service; (3) USDA Forest Service; (4) Alaska Departments of Fish and Game, Environmental Conservation, and Natural Resources; (5) Alaska Office of Management and Budget; (6) United Fisherman of Alaska; (7) Sealaska Corporation; (8) Tlingit and Haida Central Council; (9) Southeast Alaska Conservation Council; (10) U.S. Environmental Protection Agency; (11) U.S. Army Corps of Engineers; and (12) Alaska Loggers Association.

Second-growth management test areas, such as this one near Thorne Bay, Alaska, are designed to open the canopy of second-growth stands to allow light to reach the forest floor. Studies indicate the increased sunlight will produce better forage for wildlife, while at the same time stimulate tree growth.

Interagency Wildlife/Habitat Technical Committee

The charter for the formation of an Interagency Wildlife/Habitat Technical Committee was approved by the member agencies on July 30, 1984. Agencies represented on the committee are the Alaska Department of Fish and Game, U.S. Fish and Wildlife Service, and USDA Forest Service. Committee objectives are to promote cooperation and effective use of human and other resources for the public agencies dealing with wildlife resources in the coastal areas of Southeast and Southcentral Alaska.

The committee keeps member agencies advised on programs, plans, and other proposals dealing with wildlife and habitat management, promotes technology transfer, and reviews and recommends research priorities for wildlife and habitat research.

Cooperative Program for Management of Bald Eagles and their Habitat on National Forest Lands in Alaska

Alaska supports the largest natural population of bald eagles on the continent. The Tongass National Forest provides suitable nesting, feeding, and perching habitat for more than 4,000 breeding pairs, which is approximately 80 percent of the breeding bald eagles in all of Alaska. The Forest Service and the U.S. Fish and Wildlife Service have entered into a cooperative program to ensure that resource management programs on the Forest are closely coordinated to attain management objectives for the eagles and their habitat. This cooperative program has been in place since 1968 and is included in the Regional Guide and the Tongass Land Management Plan. Periodic surveys conducted by the Fish and Wildlife Service indicate the eagle population in Southeast Alaska has remained at stable high levels over the past 15 years.

A spin-off of this agreement has been a cooperative program with the U.S. Fish and Wildlife Service and the State of New York. In 5 years (1981–85), approximately 140 eagles from the Tongass National Forest have been transplanted in various release sites in New York State. Efforts to reestablish a breeding population for this species in that portion of its historic range have proven very successful.

Society of American Foresters/The Wildlife Society Report: Deer and Timber Management in SE Alaska, Issues and Recommendations

In July of 1982, a technical committee was formed by the Governor of Alaska and the Regional Forester of the Alaska Region of the Forest Service in re-

sponse to a resolution adapted by the Alaska Chapter of the Society of American Foresters (SAF) and the Alaska Chapter of The Wildlife Society (TWS). The committee was to investigate the wildlife/logging issue in Southeast Alaska.

The technical committee members represented the Society of American Foresters, The Wildlife Society, Alaska Department of Natural Resources, Alaska Department of Fish and Game, USDA Forest Service, and the Sealaska Corporation. The Committee examined the issues relating to wildlife and timber management in Southeast Alaska and made recommendations toward resolution of these issues.

The committee submitted their report, entitled "Deer and Timber Management in Southeast Alaska," to the Governor and the Regional Forester on January 11, 1984. The Forest Service has completed an implementation plan addressing the 21 recommendations contained in the technical committee's report. The action items in the Forest Service Action Plan are currently being implemented.

In addition to meeting the needs of protecting the Forest's fish and wildlife resources, the Forest Service is also committed to enhancing these same resources. Two programs demonstrate this commitment. The first is the Fisheries Habitat Enhancement Program and the other is the Second-Growth Management Program. Both are described below.

FISHERIES HABITAT ENHANCEMENT PROGRAM

During the early 1970's, the salmon fisheries in Southeast Alaska were severely depressed (fig. 3.2). At the time of Forest Plan development, the rehabilitation of the salmon resources, through habitat improvement and construction of hatcheries, was a major resource issue. Most habitat enhancement opportunities and major hatchery sites were on the National Forest. Improving the productivity of declining salmon stocks within the management constraints imposed by other resources, including Wilderness, was perceived by the public as a major management objective in the protection and enhancement of these fisheries. Recognition of this concern and the historic importance of the salmon fisheries led to increased investments in the existing fisheries enhancement program.

Starting in 1952, the Forest Service initiated a long-term fisheries habitat management program, conducted with the cooperation of the State of Alaska. Congress recognized the importance of fisheries to Southeast Alaska with Section 507(a) of ANILCA. This section provides additional mechanisms to cooperatively plan fisheries enhancement projects on the Tongass. Cooperative fisheries enhancement planning, in conjunction with Forest Service Manual objectives, insures that only biologically feasible and economically viable habitat enhancement opportunities are undertaken. As mentioned earlier, ANILCA also permits the management of fisheries resources, including habitat manipulation and construction of structural improvements in Tongass Wilderness areas.

A result of this joint concern for fisheries enhancement was the development of the Tongass National Forest Fisheries Habitat Enhancement Program. The enhancement program is intended to contribute to the commercial, sport, and subsistence fisheries harvests in the waters adjacent to the Forest.[5] The contribution of this program to the various Southeast Alaska fisheries has been significant.

The Tongass Fisheries Habitat Enhancement Program formally involves the Alaska Department of Fish and Game and both the Northern and Southern Southeast Alaska Regional Aquaculture Associations. Cooperative planning that involves these groups, provides for the integration of other fisheries plans, such as the State of Alaska Comprehensive Salmon Plans. The process serves as the source for fisheries enhancement project identification. Provisions of the planning process have been formally amended to the Memoranda of Understanding with the Alaska Department of Fish and Game and the two Southeast Regional Aquaculture Associations.

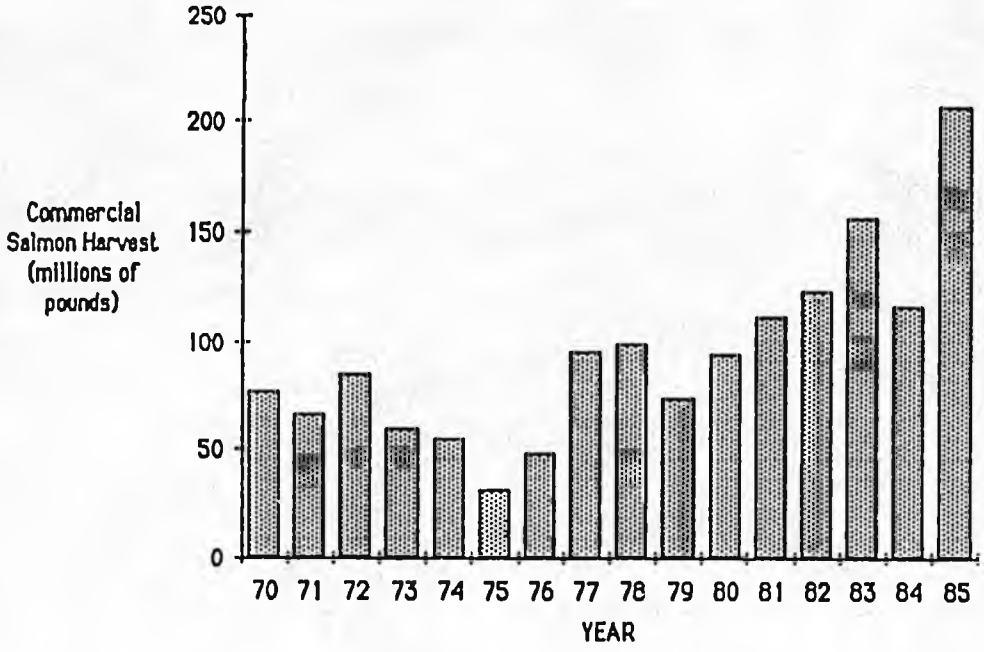
One objective of cooperative fisheries planning is to identify fisheries enhancement opportunities that will contribute significantly toward meeting the long-term (year 2000) salmon harvest goals of the Comprehensive Salmon Plan for Southeast Alaska. Fisheries habitat enhancement opportunities include a broad range of structural and nonstructural projects designed to bring suitable underused and/or barren habitats into full production. Since 1980, 41 projects have been completed that will annually add 5 million pounds of "new" salmon to the subsistence, recreational, and commercial fisheries in the region. A summary of the projects completed since 1980 is presented in table 3.1.

Another means by which fisheries enhancement program objectives on the Forest are accomplished is through the Sikes Act. The Act provides contractual authority to plan and execute, in cooperation with the Alaska Department of Fish and Game, a variety of fisheries enhancement projects requiring coordinated habitat and biological treatments. Since 1980, 14 Sikes Act wildlife and fisheries enhancement projects have been completed on the Tongass.

[5] For the period 1980-84, harvests in Southeast averaged 134.2 million pounds of salmon annually and pink and silver salmon harvests were near or exceeded record levels.

Figure 3.2

Salmon Harvests from Southeast Alaska, 1970–85



Under the Act's authority, the Forest Service has conveyed $700,000 in appropriated wildlife and fisheries habitat improvement dollars to the Alaska Department of Fish and Game to carry out this portion of the overall fisheries enhancement program.

Although not a direct measure of results, one indication of the success of the fisheries program on the Tongass is reflected in the salmon harvests in Southeast Alaska. Commercial harvests have been steadily increasing since about 1975, with harvests of pink and silver salmon near record levels for 1985. Although State and private hatcheries contribute to these fisheries, the majority (probably 80 to 85 percent) of the salmon harvested are spawned and reared in watersheds within the Tongass National Forest.[6] Cooperative fisheries enhancement continues to develop additional production of these species and works toward the rebuilding of chinook, chum, and sockeye salmon stocks throughout the region.

SECOND-GROWTH MANAGEMENT PROGRAM

Another wildlife concern addressed in the Forest Plan was that even-age management (clearcutting) would result in decreased carrying capacity for old-growth-dependent species. Central to the concern that clearcutting would decrease carrying capacity was the assumption that conversion of old-growth spruce/hemlock forest to even-age management would reduce Sitka black-tailed deer populations in the Forest. It was observed that prior to the closure of the Forest canopy, young second-growth stands would not adequately intercept snow and therefore would not provide available forage for deer during heavy snowfall. Also, when a second-growth stand reaches the point where the canopy completely closes, the sunlight is blocked and understory browse can be completely eliminated for an extended period of time.

Since 1979, there has been considerable improvement in the understanding of the habitat requirements of old-growth-dependent wildlife species. With this improved knowledge, certain silvicultural treatments are being examined to determine if they can maintain second-growth hemlock/spruce forest stands as productive habitat for wildlife, especially

[6]It should be noted that there are other important factors governing the harvest of commercial fisheries in which the Forest Service has little, if any, influence. These factors include freshwater and marine survival, high seas interception, fisheries management regulations, and predation.

deer, throughout the 100-year rotation. If such treatments are successful, they will be used to minimize the effects of harvesting certain old-growth stands on some wildlife species. While not a substitute for old-growth stands, treated second-growth stands are expected to approximate some of the essential attributes needed by species such as deer.

In 1982, an Alaska Regional Second-Growth Program management plan was approved. The goal of the plan is to:

> Develop, implement, monitor, and demonstrate a program to manage second-growth stands of hemlock and spruce forest on the Tongass National Forest to increase timber production and improve wildlife habitat.

The program consists of two phases. Phase one is short term, to establish demonstration areas to test and evaluate precommercial and commercial thinning treatments for wildlife habitat improvement. The second phase is long term, and details the overall direction and guidelines for management of second-growth forest stands in Southeast Alaska.

Six commercial thinning demonstration sites have been located and treatments developed for each. Six precommercial thinning demonstration sites will also be selected to represent the small, medium, and large island groups. Close coordination of the second-growth program with Forest Service research is maintained to identify research projects that focus on silviculture/wildlife habitat relationships. This information will be used to develop stand prescriptions for specific conditions and objectives and develop long-term guidelines for second-growth forest management in Southeast Alaska.

So far this chapter has concentrated on programs that have occurred since passage of ANILCA. The next section describes some of the programs that have not yet reached fruition or are just starting. Some have the potential to dramatically aid in the management of the Tongass.

WILDLIFE AND FISHERIES HABITAT RELATIONSHIPS SYSTEM

The Forest Plan, completed in 1979, incorporated management provisions for wildlife and fisheries that were appropriate for the period. Since then, two major factors have required that these provisions be updated. The first factor is the accumulation of information and knowledge concerning wildlife and fisheries. Much of this new knowledge was acquired through the research conducted through cooperative efforts described in a previous section.

The second factor involves changes in the National Forest Management Act Forest Planning Regulations. The regulations, which were revised in 1982, require the Forest Service to (1) specifically identify habitat objectives for management indicator species, and (2) insure that populations of all wildlife and fisheries species on the Forest are maintained. This detail and emphasis are similar to the goals of the current Forest Plan. Updating the wildlife and fisheries management direction to incorporate the current regulation provisions will be completed in the revision of the Tongass Land Management Plan.

To assist in updating the Forest Plan direction, the Wildlife and Fisheries Habitat Relationships program was begun. The program organizes biological data from various ecosystems to assist Forest managers in developing management alternatives and predicting their effects on wildlife and fisheries. This process will be in place prior to the Forest Plan revision, currently scheduled for completion in 1989.

To insure that a process will be in operation during Forest Plan revision, a 5-year action plan has been developed. The action plan assigns responsibility at the Regional and Forest levels so that wildlife and fisheries considerations may be effectively represented in the land management planning process. Action items of this 5-year plan are summarized below.

Wildlife and Fisheries Habitat Analysis Process

The Alaska Region Wildlife and Fisheries Habitat Analysis process provides a standard procedure to generate and organize information that is necessary to plan and manage habitat. The process has these objectives:

1. Provide a methodology and timetable to address specific objectives for management indicator species and to ensure that populations of all fish and wildlife species on the Forest are maintained.
2. Facilitate Forest-level implementation of existing direction contained in the Forest Plan and the Regional Guide.
3. Achieve consistency and standards of effectiveness in management of wildlife and fish habitats.
4. Organize all terrestrial and aquatic habitats of the Forest into mutually exclusive Wildlife and Fish Habitat Units for inventory and for the evaluation of existing and potential habitat condition.

Wildlife Habitat Relationships Data Base

A wildlife habitat relationships data base has been developed for use on the Tongass National Forest. The data base contains a complete listing and description of the habitats associated with each of the

390 wildlife species in Alaska's National Forests. Since 1980, more than 20 research papers and administrative studies dealing with wildlife habitat relationships on the Tongass National Forest have been completed. Wildlife research and administrative studies are the main sources of information used to improve habitat relationships data in the Wildlife Habitat Relationships Data Base.

Aquatic Habitat Management Handbook

The Forest Service Aquatic Habitat Management Handbook for the Alaska Region is in final draft form and provides fish habitat management standards and guidelines for streams and streamside vegetation. The handbook provides guidance, using the latest research findings, in formulating multiple-resource management prescriptions that maintain or enhance fish resources and water quality in the Forest. The State of Alaska and other Federal agencies have assisted with development and review of the handbook.

Interagency Fisheries and Hydrology Inventory and Classification System

Another tool used for fish habitat and water quality management is a stream classification system (channel typing). The standardized Regional stream classification system is an integral part of the Forest Service Aquatic Habitat Management Handbook. It is used with other data to identify and evaluate the quality of existing fish habitat, to predict the potential effects of management activities on fish habitat and water quality, and to assign appropriate management prescriptions.

Improved Analysis of Management Effects on Wildlife and Fisheries Habitats

While research is being carried out to provide the data necessary upon which sound management plans can be developed, computer models are using this research and monitoring data to display wildlife relationships. The end result will be better Forest

Alaskan brown bears, called grizzlies outside of Alaska, can be found in many areas of Southeast Alaska.

planning, and more effective management of wildlife habitats.

Examples of each type of activity are described below.

Habitat Models

Three types of models, designed to serve different planning needs, are under development. The first is habitat suitability index models, based on measurable habitat features related to the biological requirements of wildlife species. These models are used to evaluate the existing habitat condition, and to project how the potential to support the species will change through time assuming certain management activities. Habitat suitability models for Sitka black-tailed deer and mountain goat have been developed for Southeast Alaska, and are undergoing review. Other models will be developed for other management indicator species when species selections have been made in conjunction with the revision of the Forest Plan.

A second model type evaluates the cumulative, long-term effects of management on habitat. This model simulates management and natural processes, such as vegetation succession, over full rotations (100 years) or other specified periods. The deer model will simulate responses of the population of Sitka black-tailed deer to changes in habitat, hunting pressure, and road access that occur under multiple-resource management. The intended use of this type of model is to examine interactions of deer populations and habitat capability with other resources managed on the Forest.

The third model is a two-part deer-demand model. The first part projects hunter demand for Sitka black-tailed deer based on characteristics of the hunting public and factors that are known to affect deer population dynamics. The second part estimates the amount of winter habitat that must be maintained to meet projected levels of hunter demand for deer. Assessment of demand for wildlife is required for evaluation of management alternatives that have the potential of affecting wildlife populations.

All simulation models developed for use as habitat evaluation tools will be validated to refine applicability to resource management situations in Southeast Alaska. Validation will be accomplished over time by comparing expected to observed outcomes.

Instream Large Organic Debris Research

Recent research has demonstrated the importance of large woody debris in the habitats of juvenile salmon. In one study, the effectiveness of streamside management was evaluated by comparing habitat and fish populations located in old growth, clearcut, and habitat management units where partial timber cutting occurred. Preliminary findings indicate that summer sunshine stimulated stream productivity and increased the densities of young-of-the-year salmon in recently clearcut areas in comparison to either old-growth or management units. In contrast, densities of yearling and older salmon in summer were higher in the habitat management units than in the old-growth or clearcut units.

During winter, old-growth and habitat management units contained the most habitat (i.e., pools with cover) and had the highest densities of yearling and older juveniles. These higher densities were directly related to the amount of woody debris in the stream.

Streams adjacent to clearcuts have often contained the least pool habitat because instream woody debris, until recently, had been removed immediately after logging. From recent research, it appears that in the short term, selective logging within some streamside management units can enhance fish production by increasing the basic productivity of the stream while maintaining overwintering habitat.

Estuarine and Intertidal Marine Research

A multiagency working group has been formed to coordinate fisheries habitat research and management among the various Federal and State agencies and private groups involved in timber management in Southeast Alaska. The group's objective is to identify acceptable impacts of log transfer facilities on estuarine and marine environments. Studies being conducted include (1) assessment of the measurable biological effects of log transfer facilities, (2) methods to reduce in-water bark loss, and (3) criteria for improved log transfer siting to minimize the impact of in-water bark deposition. The Forest Service is funding cooperative studies with the U.S. Fish and Wildlife Service on bark loss and bark removal pertaining to log transfer facilities in Southeast Alaska. In addition, a technical subcommittee of the Governor's Timber Task Force, has completed a report entitled "Log Transfer Facility Siting, Construction, Operation and Monitoring/Reporting Guidelines" dated September 18, 1985. This report represents a consensus set of guidelines for designing and reviewing permit applications for log transfer and associated facilities. The Forest Service was represented on this subcommittee.

Fish Habitat Protection and Enhancement in Timber Harvest Areas

ANILCA did not change the management standards and guidelines calling for maintenance of the

biological potential of the fisheries habitats in the non-Wilderness areas of the Tongass. Protective measures for fisheries are included in the preparation of all timber sales and other resource management activities where fisheries habitat exists. Fisheries biologists and hydrologists work closely with other resource specialists, and often in consultation with the Alaska Department of Fish and Game. They prescribe streamside management practices that are designed to maintain and enhance the productivity of fisheries habitat in timber sale areas. Examples of these protective measures include the location of roads and harvest units, location of bridges and culverts to minimize sedimentation in streams, maintaining fish passage through stream crossings, protecting temperature-sensitive streams through no harvest or selective timber harvest prescriptions, and providing for the long-term introduction of large woody debris to the stream channel where it serves as essential habitat for juvenile fish.

SUMMARY

Management of wildlife and fish habitats in the Tongass National Forest is accomplished through provisions, processes, and procedures developed to implement the management direction embodied in the Tongass Land Management Plan and ANILCA. In all, there are five factors that have contributed to the attainment of management objectives for wildlife and fish habitats on the Forest.

Land Management Planning

Wilderness areas are well dispersed across the Forest and contain a variety of wildlife habitats, including some of the most productive in Southeast Alaska. However, wildlife use extends beyond Wilderness areas. Wilderness habitats do serve as a natural benchmark allowing comparison of habitat conditions in the natural state with those altered through human activities.

A combination of Wilderness and unroaded area designations will maintain natural habitat conditions in 40 percent of the areas of the Forest identified as having high wildlife values and 50 percent of the areas identified as having high commercial and recreational fisheries values.

In addition, the timber base was reduced by 273,000 acres of commercial forest land to provide for special management prescriptions associated with habitat management objectives. To date, through project-level planning, special management prescriptions have been applied to approximately 32 percent of this timber base reduction and timber harvests have been designed to ensure that these areas retain

Southeast Alaska has the largest concentration of bald eagles in North America. On the Tongass National Forest, bald eagles are managed cooperatively by the U.S. Fish and Wildlife Service, the Alaska Department of Fish and Game, and the Forest Service.

or increase their existing habitat productivity. Also, there are 244,000 acres of extended rotation related to retention provisions which will have benefits for the wildlife and fisheries resources, and visual quality objectives.

Management standards require the delineation of habitat management units with specific management prescriptions to meet wildlife and fisheries management objectives and provide for other resource considerations.

Cooperative Activities

Interagency coordination in research and management activities on the Forest is effectively contributing toward resolution of wildlife and fisheries management concerns. Standing interagency groups review, coordinate, and recommend research to develop methods to minimize or eliminate any adverse effects of timber and other resource development activities on wildlife and fisheries. Consultation with representatives of other agencies is often used during planning and management activities to ensure that adequate coordination occurs and that concerns of the consulting agencies are considered.

Fisheries Enhancement

Fisheries enhancement in Wilderness, as well as non-Wilderness, is a management objective for the Tongass National Forest. Since 1980, 41 cooperative fisheries enhancement projects have been completed which will annually produce approximately 6 million pounds of "new" salmon for Southeast Alaska's

Table 3.1 — *Tongass National Forest cooperative fisheries enhancement projects completed during the period 1980–84*

Enhancement activity (No. of projects)[a]	Estimated production of fish[b] (m lb/yr)	Ex-vessel value[c] (m$/yr)	Cost	
			Federal[d] (m$/yr)	Other[e] (m$/yr)
Fishways (11)	1,186.5	1,151.6	1,546.8	120.0[f]
Falls modification (1)	NA	NA	6.0	0.0
Spawning channel (1)	117.4	71.6	3.5	10.0
Debris Removal (8)	NA	NA	NA	NA
Lake fertilization (4)	3,160.0	3,381.2	425.2	831.0
Lake stocking (3)	830.0	821.7	175.0	NA
Stream stocking (8)	175.3	173.3	NA	NA
Rearing pond (1)	5.4	5.4	46.6	0.0
King salmon habitat (2)[g]	NA	NA	NA	NA
Fish weir (2)[h]	NA	NA	NA	NA
Salmon hatchery (1)[i]	540.1	330.1	NA	NA

NA = not available.

[a]The project totals represent the number of activities completed at different locations. Repetitive annual investments at the same site (i.e., fertilizer applied to each lake annually) are not shown, although the costs of the repetitive treatments have been included in the cost totals.

[b]Salmon production based on full utilization of habitat capability. The time it will take to reach full production varies with the species and fisheries management strategies regulating the fish stocks returning to the projects.

[c]Ex-vessel values are the gross receipts to fishermen and are derived from *Alaska Catch and Production Commercial Fisheries Statistics*, Statistical Leaflet Series; 1974–82. Alaska Department of Fish and Game, P.O. Box 3-2000, Juneau, AK 99802.

[d]The total program investment (appropriated funds) for the 1980-84 period was $12.78 million. Costs shown in the table are direct project costs (i.e., construction) and do not include indirect costs such as program planning, additional contracts for engineering, and other project development costs.

[e]Combined investments of the Alaska Department of Fish and Game and the Regional Aquaculture Associations. As indicated in the table, cooperative investment information for the majority of the projects involving these agencies was not available.

[f]Construction funds only. Alaska Department of Fish and Game salmon broodstock development costs associated with some fishway projects were not available.

[g]Cooperative enhancement demonstration projects.

[h]King salmon enhancement studies and hatchery egg take.

[i]Tlingit and Haida Fisheries Development Corporation.

fisheries. The Sikes Act authority is providing an essential linkage with the Alaska Department of Fish and Game in the implementation of the Forest fisheries enhancement program.

Second-Growth Management

Enhancing wildlife habitat carrying capacity in second-growth hemlock and spruce forests is a management concern on the Tongass National Forest. In response, a Second-Growth Management Program has been established to develop and demonstrate silvicultural treatments that have the potential of benefiting both timber and wildlife production throughout Southeast Alaska.

Wildlife and Fish Habitat Relationships

The Wildlife and Fish Habitat Relationships System provides for implementation of Forest Plan provisions for wildlife and fisheries in a manner consistent with forest planning regulations. To date, accomplishments include (1) completion of a Wildlife Habitat Relationships Data Base covering more than 400 species, (2) development of an Aquatic Habitat Management Handbook, (3) development of an integrated stream classification system, and (4) improving management of habitat relationships information which will be used to address wildlife and fisheries resource requirements in all planning and management decisions.

Small logger operation on the Tongass National Forest.

Chapter 4

Status of the Tongass Small Business Timber Sales Program

This chapter focuses on the Tongass National Forest's Small Business (SBA) Set-Aside Timber Program. In 1977 the Forest Service increased the amount of timber set aside under the Small Business Timber Program to promote opportunities for small businesses in the Alaska timber industry. Comparisons are made between timber sale characteristics under the SBA program versus conventional short-term sales, including those appraised as deficit. The role of small firms in the Southeast Alaska timber industry and the degree of competition for National Forest timber prior to and since ANILCA are examined. Finally, estimates are made of the impacts of the Federal Timber Contract Payment Modification Act on short-term timber sales in Alaska.

The current Tongass National Forest timber sales program is divided into two components: timber sales purchased under two, 50-year long-term contracts and an annual program of short-term sales.[1] The two pulp companies in Southeast Alaska obtain through the long-term contract or purchase of short-term timber sale contracts about 70 percent of the timber available under both programs. To encourage the participation of small businesses in purchasing timber sales, the Forest Service established a special timber set-aside program for Alaska in 1977 under provisions of the 1958 Small Business Set-Aside Timber Program. This SBA set-aside program gives small businesses the preferential right to bid on sales whose volume totals up to 80 mmbf of timber annually.

This chapter examines the Small Business Administration program on the Tongass National Forest. The first section describes the objectives of the small business program and the structural changes in the Southeast timber industry leading up to the program's creation in 1977. The number of firms successfully participating in the program and the amount of timber offered and sold under the program are presented. A comparison is made between the timber made available through the SBA set-aside program and the mill capacity and actual output of qualified sawmillers in Southeast Alaska. The second section compares characteristics of small business sales with other short-term sales to see if either category has had a particular advantage over the other.

The section also includes a presentation on short-term sales appraised at deficit[2] during the period 1978 to 1984. In the third section, competition for short-term timber sales since 1971 is examined, emphasizing any bidding patterns which may have evolved in SBA set-aside sales. The final section summarizes how the Federal Timber Contract Payment Modification Act is being implemented in Alaska. This Act allows short-term timber sales purchasers in Alaska a one-time emergency stumpage rate redetermination. The objective for Alaska is to provide for more equivalency between short-term and long-term timber sale stumpage rates during depressed markets.

THE SBA SET-ASIDE PROGRAM ON THE TONGASS

The SBA Set-Aside Timber Program was established on the Tongass National Forest after a series of structural changes in the Southeast Alaska timber industry. Prior to World War II, efforts to improve and stabilize the economy of Southeast Alaska focused on the natural resources of the area. It was determined that the timber supply available in Southeast Alaska could support 4-5 pulpmills. Technological changes after World War II favored larger pulpmills to make Alaska's products more price

[1] Short-term timber sales are sales requiring all harvesting to be completed within a 10-year period, normally within 5 years or less.

[2] Timber appraisals are made to determine the minimum acceptable bid price for timber. In general, estimated product selling value less estimated costs and an allowance for profit and risk determines stumpage or the minimum acceptable bid price for the standing timber. Deficit timber sales are those in which product selling value less costs results in a profit and risk margin lower than normal.

competitive with worldwide dissolving pulp markets. Four long-term contracts were initiated, two of which are operational today.

During the late 1950's and early 1960's, logs were supplied to pulp and local sawmills by company loggers, nonaffiliated or independent loggers, and by loggers under contract to the pulp companies. In the 1960's, the pulp companies began to bid on short-term timber sales. The additional timber from long-term and short-term sales was sufficient to support the expansion of pulp operations to include sawmills. As the pulp companies expanded their operations, small mill owners and nonaffiliated loggers faced greater competition for National Forest timber at a time when local uses for logs and locally manufactured lumber was disappearing. As a result, nonaffiliated loggers became more dependent on the pulp companies as an outlet for their logs, and eventually the number of nonaffiliated loggers and small sawmill operators declined. In 1975 an antitrust suit for restraint of trade was brought against the two pulp companies by a small, independent logging company, Reid Brothers. The case was eventually decided in favor of the Reid Brothers. Based on the outcome of the appeals, similar suits were settled out of court. Currently, the Federal Government is seeking damages from the two pulp firms. Today the two pulpmills and their sawmills make up about 80 percent of the mill capacity and consume approximately 90 percent of the logs processed in Southeast Alaska. Two of the three independent mills in Southeast Alaska filed for bankruptcy in 1984 and a new independent mill was opened in northern Southeast Alaska in conjunction with a Native corporation.

In 1977 the Forest Service began setting aside 80 mmbf of timber annually in short-term timber sales for small business. These sales were intended to promote opportunities for small timber businesses and are free of competition from large firms. Under the SBA Set-Aside Timber Program, timber sales are targeted for small businesses with no more than 500 employees. This program is part of 150 mmbf of timber in short-term timber sales annually available from the Tongass National Forest. In a set-aside sale, 50 percent of the volume must be sold locally to small businesses for processing. A Special Salvage Timber Sale Program (SSTS) with an annual volume average offering of 11 mmbf was, at one time, part of the set-aside program. This program continues to exist as part of the overall short-term sales program. Sales in the Special Salvage Timber Sale Program are designed to provide salvage timber to businesses with no more than 25 employees.

The number of firms successfully purchasing timber sales in the SBA set-aside program has grown from one firm in 1978[3] to a high of 12 firms in 1983. Table 4.1 shows the number of successful bidders and the number of "new" successful bidders (purchasing timber for the first time) under the SBA program between 1978 and 1984.

Table 4.1—*Number of firms bidding successfully for SBA timber sales, 1978-84*

Calendar year	Total number of firms purchasing SBA sales[a]	Number of new firms purchasing SBA sales[b]
1978	1	1
1979	2	1
1980	2	1
1981	8	6
1982	9	6
1983	12	7
1984	6	2

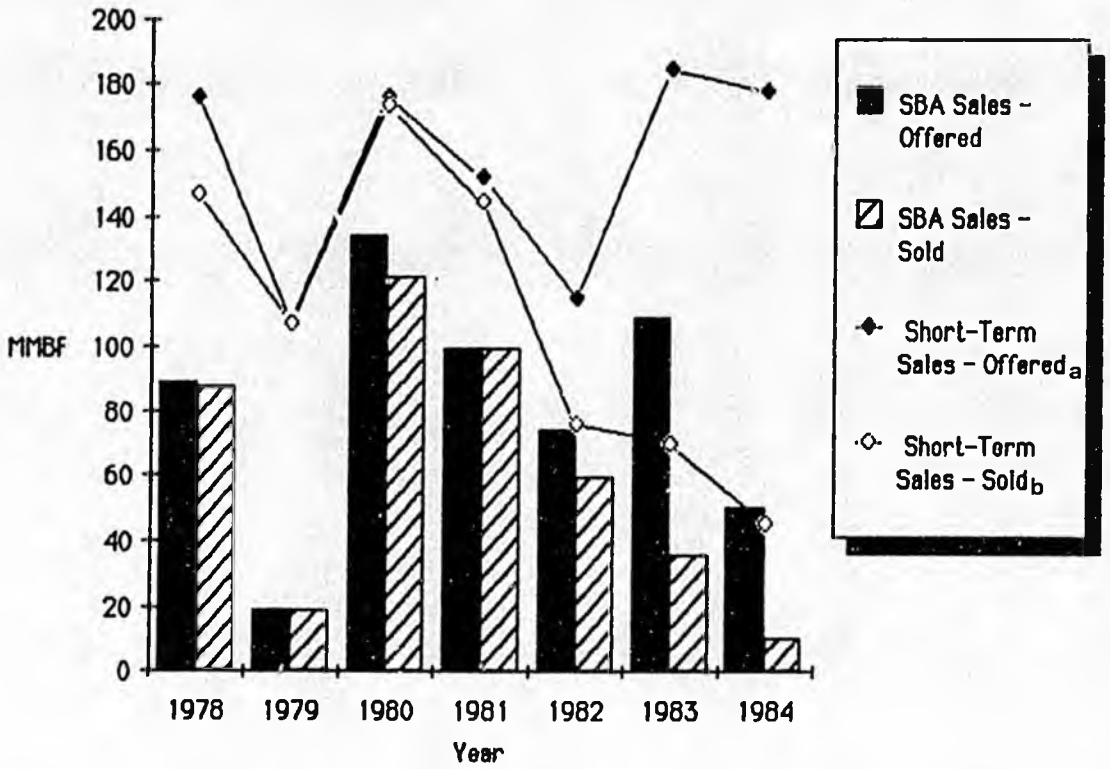
[a] All firms purchasing SBA set-aside timber sales.
[b] Firms purchasing SBA set-aside timber sales for the first time.
Source: USDA Forest Service, Alaska Region.

To date, 573.1 mmbf has been offered for sale to small businesses through the set-aside program, of which 76 percent or 432.7 mmbf has been purchased. The amount of SBA set-aside sales offered and sold under the short-term timber sales program between 1978 and 1984 is shown in figure 4.1. Since 1980, the volume of timber offered and sold under the program represents 25 percent of the combined log processing capacity of the independent sawmills. However, the volume sold represents about 125 percent of the actual production from these mills. Operating rates for Alaska mills over the last 5 years are very low, about 20 percent of capacity. Therefore, the volume purchased each year by operators in the SBA program exceeds the annual production of the mills. This has led to an increase in volume sold but not harvested. In general, half of the timber made available under the program has been of sufficient quality to be sawn into cants (rough sawn timbers) while remaining material has been suitable for pulp or woodchip production. Figure 4.2 compares the amount of timber offered and sold under the SBA set-aside program between 1980 and 1984 with the combined log processing capacity and actual production from mills not associated with the long-term operators in Southeast Alaska.

[3] Although the program was started in the latter part of 1977, no sales were made that year.

Figure 4.1

Short-Term Timber Sales Offered and Sold, 1978–84



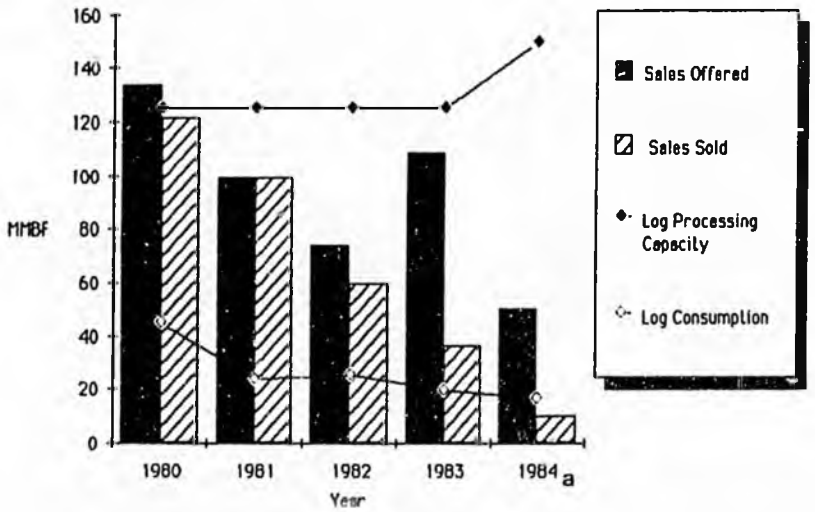
[a] Does not include utility volume which are logs too defective for lumber production but may be utilized for chip production.

[b] Including SBA sales.

Source: USDA Forest Service, Alaska Region.

Figure 4.2

National Forest Timber Available to Small Sawmills Through the SBA Set-Aside Timber Sale Program, 1980–84



[a] In 1984 two of the three small sawmills operating between 1980 and 1983 were in bankruptcy proceedings. A new mill in Yakutat was also built in 1984 by the village Native corporation there.

TIMBER SALE CHARACTERISTICS OF SBA AND OTHER SHORT-TERM TIMBER SALES

When compared to other short-term timber sales, SBA sales generally have been smaller in size, contained a larger proportion of Sitka spruce (a measure of quality), and have had nearly identical average bid prices. Table 4.2 compares such sale characteristics as sale size, species distribution, and average bid price for SBA and other short-term timber sales between 1978 and 1984.

With the decline in the timber markets for timber from the National Forest and increases in operating costs, concerns have been raised about the amount of timber offered in deficit timber appraisals. Timber appraisals are made to determine the minimum acceptable bid price for timber sales. To determine this price, harvesting and processing costs, plus a margin for profit and risk, are deducted from the estimated selling value of products made from the timber. Costs are based on data collected from actual timber sale operators and represent an operator of average efficiency. The difference between costs (including the margin for profit and risk) and the total selling value is defined as "stumpage" or the minimum acceptable bid the government is willing to accept for the standing timber. Deficits can range from a reduced profit and risk margin to zero profit margin where estimated costs exceed estimated values, exclusive of any profit. In any sale appraised at deficit, the minimum acceptable bid price is administratively set by the Forest Service at base rates (currently between $1.00 and $10.00 per mbf, dependent upon tree species).

Since 1978, the proportion of deficit to nondeficit sales has increased. Deficit appraisals, however, are not a consistent standard for judging the viability of timber sales. Despite the deficit appraisals, many of these sales are purchased.

There are a variety of reasons why deficit timber sales are purchased. Some operators may be willing to accept lower profit margins. Others may believe they can operate more efficiently than the industry as a whole (appraisal costs are based on industry averages). Operators may be speculating that the future value of timber will increase, or they may believe the appraisal estimates are incorrect. Deficit sales may also be used as collateral to secure loans, and they pose a lower risk to timber purchasers in the event that the sales must be turned back to the Government. The amount of timber that has been offered and sold in deficit and nondeficit short-term timber sales is shown in table 4.3 and figure 4.3. Timber volumes in table 4.3 are further broken down into SBA set-aside sales and other short-term sales.

Road construction costs are an important variable in the appraisal calculation. There are two types of roads built by timber purchasers: specified and temporary. Specified roads are those designed and built as structures that can be used for future timber management as well as other purposes such as general forest management, recreation, and community interties. Temporary roads are characterized by dead-end, spur roads used in harvesting timber from specific sale areas and are normally closed to vehicle access after the timber is harvested. Costs incurred by timber purchasers in building specified roads are credited against the value of the timber (stumpage) owed to the Government. Specified roads built by the timber purchaser are called purchaser credit roads. These roads are essentially built and paid for by reducing the standing value of timber. If a timber sale is deficit, the available purchaser credit (calculated in the appraisal process) may not cover the estimated costs of road construction. That portion of road cost not covered is called ineffective purchaser credit. When deficit sales are purchased, the purchaser agrees to build the roads needed to harvest the timber regardless of the advertised value of the timber. In such instances the purchaser must operate at greater efficiency than that indicated by the appraisal, absorb

Table 4.2—*Timber sale characteristics of short-term sales sold, calendar years 1978–84*

Characteristic	SBA timber sales sold		Other short-term timber sales sold	
	Average	Range	Average	Range
Sales per year	9.9	3–21	8.1	1–23
mmbf/sale	10.5	2.3–21.4	15.3	1.0–56.8
$/mbf/sale	43.0	7.5–146.6	44.0	8.5–117.4
Species mix (%):				
Spruce	34	18–76	27	19–40
Hemlock	54	22–67	64	56–71
Cedar	11	1–15	8	1–13

Source: USDA Forest Service, Alaska Region.

Table 4.3—*The volume of timber appraised as deficit and nondeficit in short-term sales, calendar years 1978-84*[a]
(In millions of board feet)[b]

	SBA sales		Other short-term sales		Total	
	Offered	Sold	Offered	Sold	Offered	Sold
1978						
Deficit	36.5	36.5	0	0	36.5	36.5
Nondeficit	77.1	77.1	64.5	61.5	141.6	138.6
1979						
Deficit	13.9	13.9	50.2	50.2	64.2	64.2
Nondeficit	28.7	28.7	32.3	32.3	61.0	61.0
1980						
Deficit	0	0	0.3	0.3	0.3	0.3
Nondeficit	93.8	93.8	50.5	50.4	144.3	144.2
1981						
Deficit	140.3	140.3	0.4	0.4	140.7	140.7
Nondeficit	0.5	0.5	15.8	15.8	16.3	16.3
1982						
Deficit	72.3	56.6	33.7	0	106.0	56.6
Nondeficit	10.2	1.7	0	0	10.2	1.7
1983						
Deficit	126.6	31.3	42.9	42.9	169.4	73.9
Nondeficit	0.1	0.1	0	0	0.1	0.1
1984						
Deficit	67.9	28.0	66.9	9.8	134.7	37.9
Nondeficit	0.8	0.8	0	0	0.8	0.8

[a] Does not include timber under contract in the long-term sales. Volumes are estimates based on sales over $2,000 using standard USDA Forest Service appraisal procedures. The volumes include carry-over sales from prior years, but exclude salvage sales.
[b] Includes utility volume. Utility logs are low quality, high-defect logs which are used almost exclusively for pulp.

the costs by reducing the margin for profit and risk, sell the timber at higher values than assumed in the appraisal, operate at a loss, or employ some combination of these measures. The miles of roads that have been appraised in timber sales as effective and ineffective purchaser road credits are shown in table 4.4. *As timber purchasers elect to have stumpage rates redetermined (reduced) under provisions of the Federal Timber Contract Payment Modification Act, ineffective purchaser credits calculated for past sales will increase.*

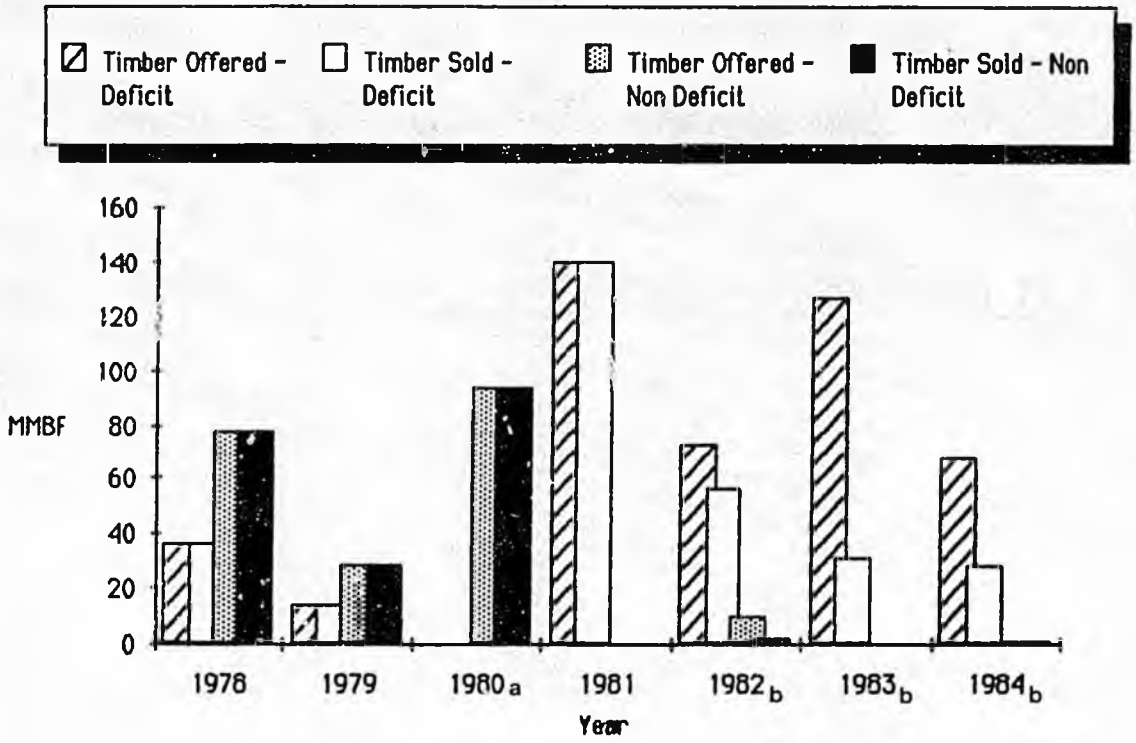
In addition to those roads constructed by the timber purchaser, the Forest Service also builds roads in areas prior to timber sales. "Preroading," as it is termed, is designed to reduce the cost of access by providing additional investment in areas scheduled for harvest with timber stands defined in the Forest Plan as being economically marginal, needing advanced logging equipment or stands where environmental mitigation needs require additional investments. The proportion of new roads built by the Forest Service in relation to those built by the timber purchaser (purchaser credit) has increased from 5 percent in 1981 to an estimated 70 percent in 1985. This includes newly constructed roads, as well as needed reconstruction of existing roads.

COMPETITION FOR SHORT-TERM TIMBER SALES

Measuring competition for short-term timber sales is difficult because of the small number of firms in Southeast Alaska. The amount of short-term timber volume purchased by small and large firms before and after ANILCA is presented along with the number of short-term sales receiving only one bid.

Figure 4.3

SBA Sales Appraised as Deficit and Nondeficit, 1978–84



[a]In 1980 there were no deficit sales offered or sold.
[b]All sales in these years were appraised in deficit.

Table 4.4 — *Miles of roads appraised in short-term timber sales and the proportion of roads with ineffective purchaser credits, 1978–84*[a]

Calendar year	Total volume appraised[b] (mmbf)	Miles of specified roads appraised[c] (miles)	Percent of roads appraised with ineffective purchaser credit	
			% advertised[d]	% sold[e]
1978	153.5	58.8	4	3
1979	106.0	62.2	32	0
1980	106.6	47.7	0	0
1981	120.5	61.4	55	0
1982	46.8	10.1	100	0
1983	68.0	44.3	100	0
1984	24.2	9.2	84	71

[a]The past amount of timber sold with ineffective purchaser credit will increase as timber purchasers elect to have stumpage rates redetermined (reduced) under provisions of the Federal Timber Contract Payments Modification Act.
[b]Total timber volume associated with specified roads identified under "Miles of specified roads appraised."
[c]In addition to roads being built by the timber purchaser, the Forest Service builds roads in areas prior to timber sales. This is to reduce the cost of access into scheduled harvest areas with marginal timber stands or stands where environmental mitigation needs require additional investments. Since 1981, the Forest Service has constructed about 29 percent of the roads built on the Tongass National Forest.
Bidding for National Forest timber sales is by sealed bid. Since 1971, approximately one-quarter of the timber volume purchased by small firms and one-half of the total timber volume purchased by large firms have been purchased in sales with only one bid (without competition).
[d]An estimate based on timber appraisal information prior to bidding and sale.
[e]An estimate based on timber appraisal information and actual bids.
Source: USDA Forest Service, Alaska Region.

Bidding patterns for SBA set-aside sales are also examined.

During the period 1971–80, about 60 percent of the volume sold in short-term sales went to large firms with the remainder going to small firms. This division does not reflect those small firms who may have been affiliated with the two pulp companies at one time. Between 1978 and 1980, nearly 70 percent of the volume sold to small firms was through the SBA set-aside program. Prior to 1980, only two non-SBA short-term timber sales were bid on by small firms without competition from large firms. Thus, aside from the SBA program, small firms provided little competition for larger firms for short-term timber sales. After 1980, however, large firms no longer actively bid on short-term sales and 95 percent of these sales (73 percent were SBA set-aside sales) went to small firms (table 4.5). The proportion of short-term sales purchased by small firms with only one bidder increased from 20 percent between 1971 and 1980 to about 30 percent since 1981.

While no bids were received for the first two SBA sales in 1977, virtually all of the SBA sales offered between 1978 and 1980 were purchased. Approximately 70 percent of this volume was sold to one firm. After 1980, bidding patterns began to show some changes. Beginning in 1981, bid prices began to drop dramatically and the number of single-bid sales significantly increased. Table 4.6 summarizes SBA sale offerings, sales sold, average number of bidders in sales having two or more bidders, number of sales having one bidder, and average bid prices for all SBA sales between 1978 and 1984.

While the SBA Set-Aside Timber Program has made more National Forest timber available to small firms, it is not clear whether the program has increased competition between firms participating in the short-term timber sale program. Several events of the last 10 years have clouded the picture, making meaningful interpretation of the bidding patterns difficult. These events include:

1) The unusually small volume of timber sold under the short-term timber sales program between May 1975 and August 1977 (8.5 mmbf).
2) The Reid Brothers antitrust suit, filed in 1975, which was brought against the two pulp companies over restraint of trade. The case was decided in favor of the Reid Brothers.
3) The creation of the SBA set-aside sales program on the Tongass National Forest in 1977. Initially there appeared to be strong competition among small firms for the SBA sales.
4) The entry of private landowners into the timber industry of Southeast Alaska. The proportion of total timber harvested in Southeast Alaska from private lands has increased from 15 per-

Table 4.5 — *Volume of short-term timber sales sold to small and large firms, 1971–84*
(In millions of board feet)[a]

Period	Sales with no competition (one bidder)		Sales with competition between small firms only (two or more bidders)	Sales with competition between small and large firms (two or more bidders)	
	Small firms (awarded volume)	Large firms (awarded volume)	Small firms (awarded volume)	Small firms (awarded volume)	Large firms (awarded volume)
			Short-term timber sales (without SBA sales)		
1971–80	5.2	218.5	25.9	78.0	260.5
1981–84	17.0	15.8	29.5	32.0	0.0
Total	22.2	234.3	55.4	110.0	260.5
			SBA set-aside timber sales		
1978–80	62.2	NA	166.6	NA	NA
1981–84	87.5	NA	177.3	NA	NA
Total	149.7	NA	343.9	NA	NA

[a] Does not include utility volume which are logs too defective for lumber production but may be utilized for chip production.
NA = not applicable.
Source: USDA Forest Service, Alaska Region.

Table 4.6—*Number of SBA bidders and average bid price, 1978–84*

Calendar year	Sales offered	Sales sold	Average number of bidders in SBA sales (with competition)[a]	Number of single-bid SBA sales (without competition)	Average bid price ($/mbf)
1978	6	5	3.0	1	43.00
1979	3	3	3.0	0	60.27
1980	5	5	2.0	3	146.59
1981	10	9	3.0	2	14.52
1982	33	21	2.6	7	11.33
1983	24	15	2.7	7	7.50
1984	15	11	2.3	6	18.09

[a]SBA sales that sold and received two or more bids.
[b]1980 represents the high point in speculative bidding.
Source: USDA Forest Service, Alaska Region.

cent in 1980 to 44 percent in 1984. Approximately 80–90 percent of the timber harvested from private lands is exported as round logs. Round log exports may have been a factor in the reduced demand for National Forest timber due to a general preference for round logs in Pacific Rim markets.

5) The severe recession which hit the timber market in 1981, and reducing demand for timber products and dampening all timber sales activities. Like most timber operators in Southeast Alaska, SBA firms have been hurt by poor market conditions. In 1984, two of the three small firms most active in the SBA Set-Aside Timber Program filed for reorganization under chapter 11 of the Federal bankruptcy laws. These two mills, on average, had processed 48.5 mmbf of timber annually since 1978.

THE FEDERAL TIMBER CONTRACT PAYMENT MODIFICATION ACT

The Federal Timber Contract Payment Modification Act was signed into law on October 16, 1984 in an effort to provide some relief to National Forest timber purchasers who had overbid on sales and faced large financial losses. Of special importance to Alaska is section 4 of the Act, enabling purchasers of short-term timber sales in Alaska to receive rate redeterminations. Prior to the Act, emergency rate redeterminations were not available for timber sale contracts of less than 7 years in length.[4] Qualifying short-term timber purchasers can now have the original stumpage rates reappraised, thereby lowering the amount owed to the Government. Only those sales sold between January 1, 1974 and July 31, 1985, qualify for the emergency rate redeterminations. Revised rates will apply to volume harvested and scaled between January 1, 1981, and October 15, 1989.

The Forest Service estimates that about 558 mmbf of timber could be affected, with refunds to purchasers approaching $2.6 million from current harvests and an additional $4.0 million from harvesting on eligible sales by 1989. As of October 31, 1985, 168 timber purchasers in Southeast Alaska were notified that their sales qualified. Forty-three timber purchasers have subsequently requested the rate redeterminations, affecting 179 timber sales. About 95 percent of the requested rate redeterminations have been completed.

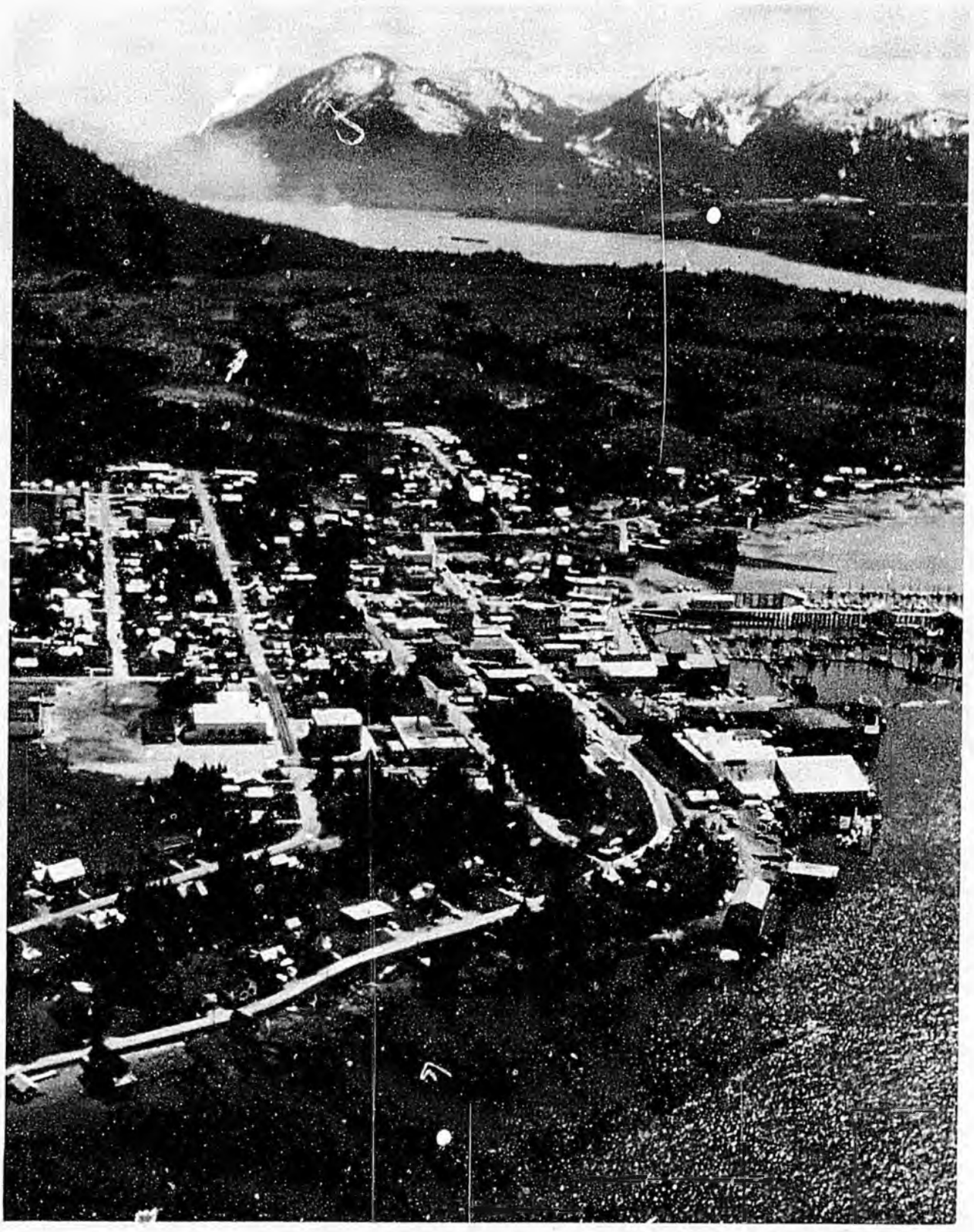
SUMMARY

The SBA Set-Aside Timber Program was established in response to a growing orientation of the Southeast Alaska timber industry towards the two pulp companies. At the time the SBA program began, both pulp companies ran integrated operations, each consisting of logging, dissolving pulpmills, and sawmills. Jointly, the two pulp firms purchase about 70 percent of the Tongass National Forest timber sold. The objective of the SBA set-aside program is to foster smaller logging and sawmilling operations in Southeast Alaska. About 80 mmbf of Tongass National Forest timber is offered each year free of competitive bidding from larger firms to small businesses. While the SBA set-aside program has resulted in greater purchases of timber by small firms, it is not clear whether the program has created greater com-

[4]Provisions within the long-term contracts allow for emergency stumpage rate redeterminations in prolonged poor markets. Emergency rate redeterminations were requested by both the long-term sales, covering the total volume appraised for the 5-year operating periods in effect at the time of the request. Both requests resulted in substantial reduction in payment rates.

petition between firms in the program. The number of firms purchasing SBA set-aside sales has increased substantially since the program was started in 1977, but the number of single bid sales (no competition) has also increased dramatically.

Poor markets for wood products made from Tongass National Forest timber since 1980, as well as higher-than-average production costs have resulted in a growing proportion of timber sales (offered and sold) appraised as deficit. The amount of SBA set-aside timber offered and sold between 1980 and 1984 corresponds to roughly 25 percent of the total sawlog processing capacity of small mills but about 125 percent of their actual sawlog consumption during the period. This has resulted in very low production rates in the smaller mills, averaging only 20 percent of the total log processing capacity since 1980. Consequently, much of the timber purchased through the SBA program has not been harvested. Major relief will be available to small firms in the form of emergency stumpage rate redeterminations under the Federal Timber Contracts Payment Modification Act of 1984. However, the sawmill industry is still very depressed with two (both SBA firms) of the six sawmills in Southeast Alaska in bankruptcy and the remaining four firms operating intermittently.



Petersburg is representative of the many towns of Southeast Alaska that are economically dependent upon the natural resources of the area.

Chapter 5

Community Stability and Timber Economics on the Tongass National Forest

This chapter examines the role of Forest Service management objectives for community stability and the evolution of the timber industry within Southeast Alaska's economy. The rationale behind Forest Service primary manufacturing requirements and long-term timber sale contracts is described. An analysis is made of the present net value of the Forest's timber program using different management objectives and market conditions. Recent closures of several sawmills and temporary shutdowns at the two pulpmills in Southeast Alaska have sparked interest in the impact a more diversified product mix might have on the region's timber industry. Currently only cants, woodchips, and dissolving pulp are manufactured in the region. Other products potentially suitable for production from Southeast Alaska timber include plywood, dimension lumber, flakeboard, oriented strand board, and fluffy pulp. An analysis is made of the dollar returns associated with an alternative mix including some of these products. Finally, Forest Service efforts to increase the economic efficiency of long-term harvest and public investments in roading through improved timber sale design are described.

Development and use of the bountiful natural resources of Southeast Alaska has been the economic mainstay of the region from its earliest days. Prior to the mid-1950's, mining and salmon processing provided the bulk of jobs and money for Southeast Alaska, but both were highly seasonal and subject to "boom and bust" swings. While timber, like any natural resource industry, was also subject to market cycles, it was believed that more local timber processing and wood products manufacturing would help stabilize the Southeast Alaska economy by providing more opportunities for year-round employment. It was anticipated that timber-related employment would help to build the kind of local tax bases necessary to support public services (schools, water, fire protection, etc.) generally viewed as beneficial to communities. The resulting demand for service and trade industries would stimulate further economic growth.

The roads associated with forest access were also viewed as a source of stability by providing land transportation links between previously isolated communities on the same islands or peninsulas. While road access was viewed by many as beneficial, not all Alaskans or Southeast Alaska communities viewed these land links as positive or stabilizing attributes. Some preferred the remoteness and "frontier" lifestyle which had attracted them to Alaska.

PRIMARY PROCESSING AND LONG-TERM TIMBER SALE CONTRACTS

As part of the effort to promote a stable timber industry, primary processing policies and long-term timber sale contracts were developed for Tongass National Forest timber. The primary processing regulation was designed to promote greater year-round local employment by requiring that timber harvested from the National Forest be sawn into cants, pulped, or chipped prior to export from Alaska, including to the lower 48 States.

Between 1906 and 1953 an annual average of 40 mmbf of timber was harvested, primarily serving local mining, fishing, and construction markets. This level of timber harvest was inadequate to support a stable industry and meet the needs of potential markets in the lower 48 States and Pacific Rim. Thus another way was sought to establish a larger-scale timber industry in Southeast Alaska.

The creation of long-term timber sales contracts was seen as one way to expand the industry. By providing a guaranteed long-term supply of timber, the economic risks associated with expansion of the timber industry would be reduced; thus helping attract the capital required to make the necessary investments. Four contracts were originally contemplated in each of four distinct regions within

Southeast. The four "working circles," as they were termed, were centered in Ketchikan, Sitka, Wrangell, and Juneau. Although a pulpmill was key to each contract, other sawlog and plywood mills were expected to evolve as timber operations expanded.

Ultimately only two 50-year contracts became operational. In 1954 the Ketchikan Pulp Company (presently owned by Louisiana Pacific-Ketchikan) began operation of its dissolving pulp plant with an initial capacity of 300 tons per day. (Dissolving pulp is used in the production of a variety of products such as rayon, cellophane, certain photographic films, and some dietary products.) The next year, Alaska Lumber and Pulp Company (later becoming Alaska Pulp Company) signed a contract to begin similar pulp operations in Sitka in 1961. The Pacific Northern Timber Company signed a contract for establishing an optional 80-ton-per-day pulpmill and/or sawmill operation. A sawmill was built in Wrangell. The contract was modified in 1965 to remove the pulpmill-related requirements, shorten the contract length, and reduce the contract volume. The Pacific Northern long-term timber sale was eventually completed by the Alaska Lumber and Pulp Company in 1982. Unsuccessful attempts by Georgia-Pacific, St. Regis Paper, and later U.S. Plywood-Champion Paper to establish a newsprint plant in Juneau eventually led to the cancellation of the fourth contract in 1976.

The successful operation of three long-term contracts and the construction of two pulpmills did help to diversify the region's economy. Figure 5.1 compares the average annual value of the three major natural resource product groups (fisheries, timber, minerals) from Southeast Alaska in the years immediately before (1949-53) and after (1954-58) the creation of a pulp industry. The period since 1979 is also included to provide some indication of what has happened since the passage of ANILCA in 1980.

In terms of value, the forest products industry has increased substantially since the creation of the pulpmills, growing from 10 percent of the value of natural resource products produced in Southeast Alaska (1949-83) to 62 percent (1949-83).

Employment in natural resources shows similar trends (figs. 5.2 and 5.3). In 1954, timber industry employment represented 29 percent of the employment in the natural resources industries of Southeast Alaska (fisheries, timber, minerals), or about 8 percent of the region's total employment. By the mid-1970's, employment in the timber sector had more than tripled. The proportion of timber industry employment in the natural resources industries had risen to 54 percent by 1974, or about 14 percent of the total employment in the region.

Since 1980, timber-related employment in Southeast Alaska has averaged about 2,400 jobs annually, supporting an additional 1,100 jobs throughout the economy. In the last few years, however, timber employment has fallen. Today timber employment represents only 39 percent of the employment in the natural resources industries, or about 7 percent of Southeast Alaska's total employment.[1]

THE ROLE OF ROADS IN THE DEVELOPMENT OF SOUTHEAST ALASKA

Roads supporting timber harvest on the Tongass National Forest also created opportunities for expanded community and economic development. Unlike some other regions of the United States where major "farm to market" transportation networks were already in place, the highway system in Southeast Alaska has evolved with the construction of forest access roads. Several forest access roads near communities have been upgraded and incorporated into the State highway system.

An example of this progression in road development is the highway system on Prince of Wales Island. When large-scale timber operations began on the island in the 1950's, a land-based transportation system was virtually nonexistent. Since then, roads originally constructed for forest access have been upgraded and extended. Sixty-nine miles of these roads have been incorporated into the State highway system connecting existing and new communities[2] on the island.

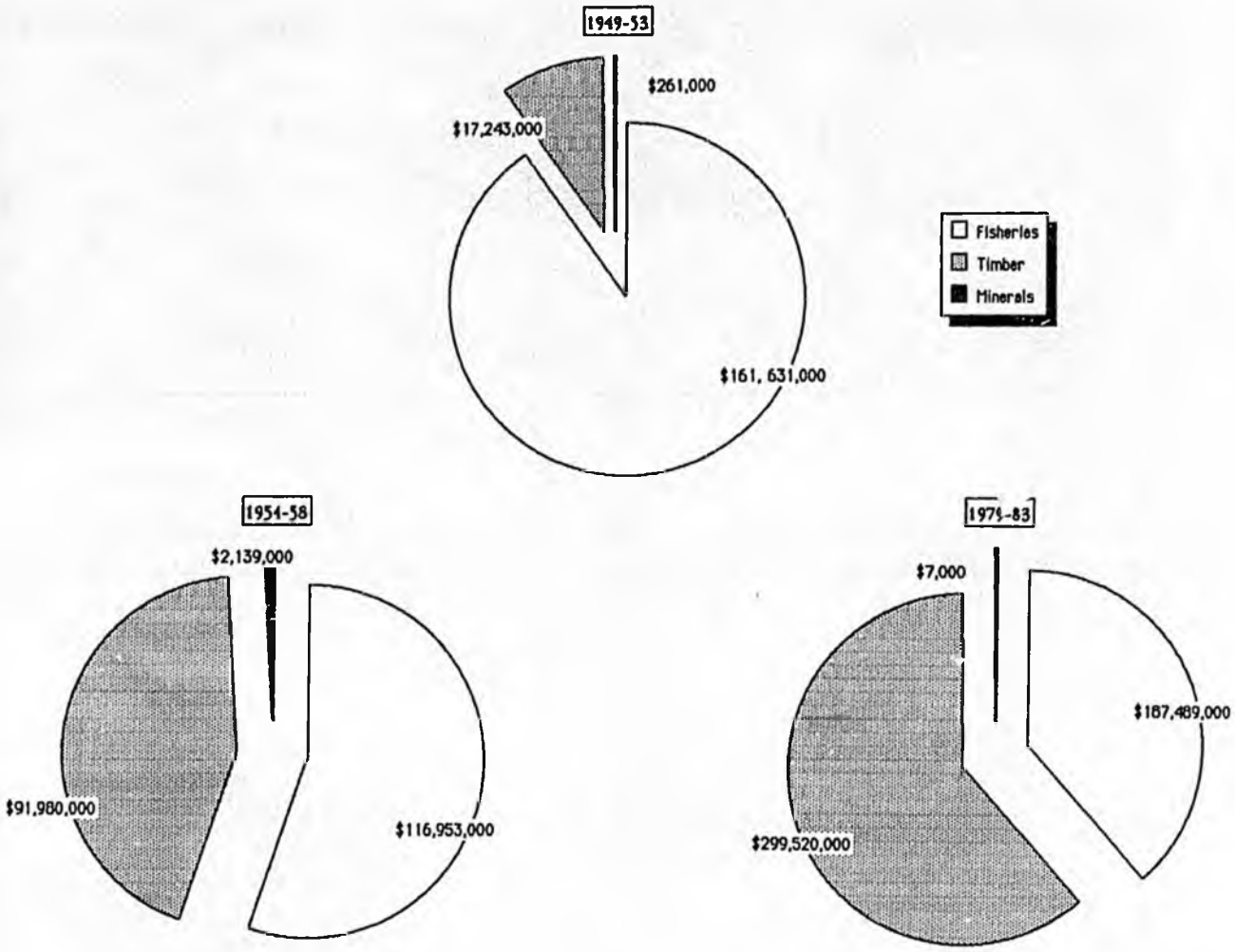
In 1984 the community of Hydaburg was connected to the State highway system for the first time, providing access to the ferry system at Hollis and other communities on the island. Both Thorne Bay, a community which began as a logging camp, and Hydaburg have prepared plans to construct port facilities and serve as transshipment locations for the other communities on the island. Other resource

[1] By contrast, employment in government and the trade and services sectors has experienced a steady increase since the mid-1950's. Government employment (Federal, State, and local) has risen from 33 percent in 1954 to about 39 percent of the region's total employment today. Fueled by government spending of petroleum dollars and increased tourism, employment in trade and service-producing sectors (wholesale and retail trade, personal services, transportation, communications, utilities, insurance, finance and real estate) has grown from 27 percent of the region's total employment in 1954 to 35 percent today. (Source: Rogers, George W. 1985. *The Southeast Alaska Regional Economy and Communities: Evolution and Structure.* University of Alaska, Anchorage, Alaska. 72 p.)

[2] New communities have developed on the island in association with logging camps and as a result of land entitlements made under the Statehood Act.

Figure 5.1

Average Annual Value of the Major Natural Resources Products Produced in Southeast Alaska, 1949–53, 1954–58, 1979–83[a]



[a]Does not include food value of fish or game taken by sports and subsistence fishermen and hunters. Value of sand, gravel, and stone is excluded. Raw fur and agricultural products values are not included as their value is negligible. Converted to 1985 dollars using the GNP Implicit Price Deflator.

Source: Rogers, George W. 1985. *The Southeast Alaska Regional Economy and Communities: Evolution and Structure.* University of Alaska, Anchorage, Alaska. 72 p.

activities such as mineral exploration, mining and mine development, and small-scale sawmilling and shake manufacturing have been facilitated by the road network on Prince of Wales Island. Road-related recreation has also increased on the island. Alaska State ferry traffic statistics report a two- to threefold increase in vehicle and passenger numbers at the Hollis terminal since 1979.

While road access opens areas to greater use, it also changes tl kinds of uses that are available. Vehicles, for example, may now visit areas that were once only accessible by foot or boat. This change may or may not benefit surrounding communities, depending on the level of demand for each activity and the actual effects of the road.

Because opportunities for different life-styles are important to Alaskans, not all communities have viewed roads as a benefit. For some, the relative isolation and limited access of unroaded areas make these small Alaskan communities an attractive place to live.

While Prince of Wales Island is not representative of all of Southeast Alaska, it does provide an example of the kinds of impacts and opportunities road development can potentially create.