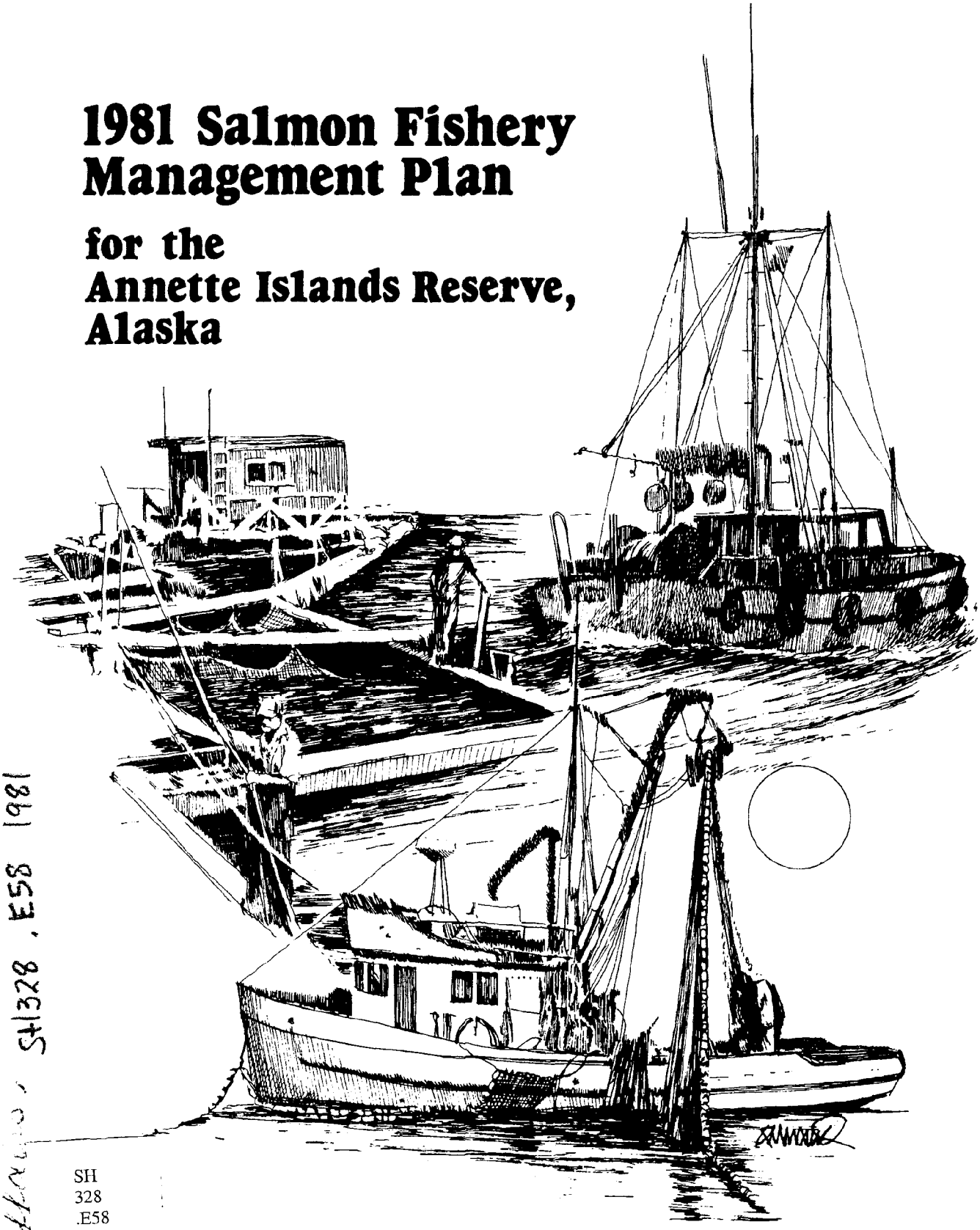
1981 Salmon Fishery Management Plan

for the Annette Islands Reserve, Alaska



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ENVIRONMENTAL ASSESSMENT

JUNEAU AREA DIRECTOR APPROVAL
of
ANNETTE ISLANDS FISHERY RESERVE

PURSUANT TO PART 88 OF TITLE 25
of the
CODE OF FEDERAL REGULATIONS

May 26, 1981

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PART 1

PURPOSE OF AND NEED FOR ACTION

The purpose of this action is to approve a plan for management of harvesting salmon in CY-81 in the Annette Islands Fishery Reserve requested by the Metlakatla Indian Community Council pursuant to 25 CFR 88.3(c) and (e) which provide in relevant part:

> *(c) Trap fishing season. Fishing for salmon with traps operated by the Metlakatla Indian Community is permitted only at such times as commercial salmon fishing with purse seines is permitted by order or regulation of the Alaska Board of Fish and Game for Commercial Fishing in any part of the following area: from the point at which meridian 132° 17'30", thence due east along said parallel to longitude 130° 49'15" then due south along said meridian to the point at which it intersects with the United States-Canadian boundary, Thence due west along said boundary to the point of beginning, provided, however, that the Secretary or his duly authorized representative may upon request by the Metlakatla Indian Community, authorize fishing for salmon with traps, at such other times as he shall prescribe, which authorization shall be based upong the following criteria:*
>
> *(1) Number of fish required for spawning escapement and any other requirements resonable and necessary for conservation;*
> *(2) Fair and equitable sharing of the salmon resource with other user groups fishing in State waters under State law and within the State fisheries management system; and*
> *(3) The federal purpose in the establishment and maintenance fo the Metlakatla Indian Reservation...*
>
> *(e) Other forms of commercial fishing. All commercial fishing, other than with traps, shall be in accordance with the season and gear restrictions established by rule or regulation by the Alaska Board of Fish and Game for Commercial Fishing in any part of the previously defined area; provided, however, that the Secretary or his duly authorized representative may, upon request by the Metlakatla Indian Community authorize such other commercial fishing at such times as he shall prescribe, which authorization shall be based upon the following criteria:*
>
> *(1) Number of fish required for spawning escapement and any other requirements resonable and necessary for conservation;*

(2) Fair and equitable sharing of the fishery resource with other user groups fishing in State waters under State law and within the State fisheries management system; and
(3) The Federal purpose in the establishment and maintenance of the Metlakatla Indian Reservation.

(28 FR 7183, July 12, 1963; 28 FR 12273, November 20, 1963, as amended at 40 FR 24184, June 5, 1975)

(See: Appendix D)

The Metlakatla Indian Community has requested the Area Director of the Juneau Area Office to authorize trap fishing and other forms of commercial fishing at such times as the Area Director may prescribe. This request was made pursuant to Metlakatla Indian Community Council Resolution (See: Appendix E & F). A chart of the proposed plan representing the time requested by a 1981 resolution has been submitted and a justification of the plan will be presented to the Area Director in April, 1981 (See: Appendix H). The purpose of this action, therefore, is to exercise a trust function upon a satisfactory showing by the Metlakatla Indian Community that such authorization satisfies the regulatory criteria. This action is needed because the Metlakatla Indian Communtiy has satisfied the Juneau Area Director that the requested schedule fulfills the criteria established by 25 CFR 88.3 (c) and (e).

The need for a comprehensive plan for the harvest of salmon specifically for the Annette Islands Fishery Reserve arises from a congeries of historical and legal developments underlying the regulatory system governing fishing in the reserve waters and related to the exclusivity and jurisdictional authority in the reserve waters.

The Annette Islands Reserve was set apart as a reservation by Congress in 1891 to be held by them "under such rules and regulations and subject to such restrictions as may be prescribed from time to time by the Secretary of Interior" 26 Stat. 1095, 1101. An exclusive fishery on the Annette Islands was established for the benefit of the Metlakatla Indian Community by Presidential Proclamation on April 28, 1916 (See: Appendix A) which provides in relevant part that the Annette Islands Fishery Reserve is "to be used by (the Metlakatlans) under the general fisheries laws and regulations of the United States as administered by the Secretary of Commerce."

Up to and including the 1959 fishing season, the Metlakatlans fished the reserve waters by purse seine and traps under the direct control of the U.S. Fish & Wildlife Service. Weekly and seasonal closed periods were established by the Service in its annual regulations, setting forth such period for all of Alaska.

With the advent of statehood, the State of Alaska assumed regulation of the Alaska salmon fishery and challenged the right of the Metlakatla Indian Community to the continued use of salmon traps and to the exclusive use of the Annette Islands Fishery Reserve. Conflict between the State and the Community culminated in the U.S. Supreme Court decision, Metlakatla Indian Community V. Egan, 369 U.S. 45 (1962) in which the Court said that the regulation of trap fishing in the Annette Islands Fishery Reserve is within the power of the Secretary under the Act of March 3, 1981 (26 Stat. 1095). (See: Appendix A)

The Interior Department had, after Alaska statehood, decided that the Metlakatlans might continue use of certain salmon traps and maintain the right to exclusive use of the fishery reserve. To avoid the necessity of almost daily supervision, the Department further decided on April 8, 1960 that the waters of the Reserve would be open to fishing whenever State of Alaska regulations permitted purse seining within a described area (Figure 2). As initially drafted, the regulations tied fishing in Reserve waters to the Southeast Clarence Straits regulatory district as described by prior Federal and the then current State regulations. (See: Appendix B)

In the 1963 season, the State abandoned the regulatory Districts and Sections that had been listed uner U.S. managment. For the most part, the old boundaries were maintained with just the substitution of numbers to replace the former descriptive names of areas. One notable exception was the combining of the former Southern District and Southease Clarence Straits Section into one large area designated District 1-E. By amendments of April 29 and July 11, 1963 the Secretary of Interior modified the Federal Regulations giverning the Annette Islands Fishery Reserve to reflect the State Pattern while maintaining the essential protection for Metlakatla.

As of July 11, 1963 the regulations provided:

> *"Fishing...is permitted only at such times as commercial fishing with purse seines is permitted by...Alaska...in any part of Fishing District No. 1 provided that in any event, fishing is permitted for not less than one week beyond the last closing date established...by Alaska in that portion of District 1 which lies east of 131 degrees 12 minues west longitude."*

The State established a new gillnet area, 1-C, in 1963 but openings delayed until August 4th. In 1964 the delayed opening was cancelled and the area opened to gillnetting on June 14th. The effect was to remove a major purse seine fishery from the old Southern District. As fishing at Annette was tied to fishing with purse seines in fishing District 1, this switch to gillnetting undermined the protection previously afforded the Annette Islands under the regulations and laid the foundation for the discriminatory steps taken in 1965.

In this regulatory scheme, the Annette Islands fishery was open for only 11 days of the 1965 season. In contrast the State of Alaska opened adjacent gillnet area for 56 days. As a result the Metlakatla Indian Community formally requested the Secretary of Interior to reverse the regulations to afford the Community the opportunity to catch a fair share of the fish runs.

Conferences between representatives of the Interior Department and the Community took place late in 1965 and early in 1966. Interior Department representatives suggested that all parties concerned wait another one or two years to more clearly assess the impact of the then regulatory system.

In 1968 the Community confronted the Interior Department with results of the 1966 and 1967 fishing seasons. The Community's conclusion was that the results indicated that State regulation was illogical and prejudicial to the Community's interests and so politically motivated as to require closer Federal scrutiny through revision of the regulations. The Community's rationale was that the State's unequal treatment did not create serious problems in a good year, however, the system deepened losses in both bad and moderate years.

At the Community's request the Department of Interior amended the regulations to provide:

> *88.3 Commercial fishing, Annette Islands Reserve.*
>
> *(c) Trap fishing season. Fishing for salmon with traps operated by the Metlakatla Indian Community is permitted only at such times as commercial salmon fishing with purse seines is permitted by order or regulation of the Alaska Board of Fish and Game for commercial fishing in any part of the following area: from the point at which meridian 132° 17'30" intersects the United States-Canadian boundary due north along said meridian to latitude 55° 33'00" thence due east along said parallel to longitude 130° 49'15", thence due south along said meridian to the point at which it intersects with the United States-Canadian boundary, then due west along said boundary to the point of beginning.*
>
> *(e) Other forms fo commercial fishing. All commercial fishing, other than salmon fishing with traps, shall be in accordance with the season and gear restrictions established by rule or regulation for Fishing District No. 1F by the Alaska Board of Fish and Game for Commercial Fishing except that the season for purse seine fishing for salmon shall be same as provided in paragraph (c) of this section.*
>
> *(F.R. Doc. 68-9683; Filed, August 13,* 1971 *8:46 a.m.)*

In 1975 the Metlakatla Indian Community again appealed to the Department to amend the regulations.

Early in 1975 Alaska officials indicated that, in anticipation of a poor salmon run, the southern district might not be opened to purse seining. The State said no seining would be allowed in Districts 1 and 2, to which Metlakatla trap operations were tied under the regulations, until there was adequate escapement in the bays of the inland waters, probably sometime in August. The Community pointed out that an August opening would discriminate unfairly against the Metlakatla traps since by August the salmon would already have passed the reserve. The Community also pointed out that the crisis and injury to the Community were aggravated by the State's limited entry law, under which a number of members of the Community would be unable to fish in State waters in Southeast Alaska. The gillnetters were hardest hit by the law. Only nine out of 22 persons were expected to be eligible for State permits. Because the 3,000 foot zone surrounding Annette Island was not a designated gillnet area under the State regulations, those persons who did not receive a gillnet permit were unable to fish at all. The Community further argued that the regulations should be amended because they Secretary's deference to State law by allowing trap operation only during the purse seine season in the District, was operating in a way that allowed the State law to effectively prevent fishing and trap operation in the reserve.

The Community pointed out that the Court in Metlakatla V. Egan disapproved of the Secretary taking only limited action by merely authorizing operation of the traps and choosing a role as an "Automaton." The Court ruled that the Secretary's trust responsibility under the Act creating the reserve required:

> *his judgement on a complex of facts, his evaluation of the relative weights of the Indians' need for traps and of the impact of traps at Metlakatla on the State's interest in conservation.*

The Community argued: If the federal trust responsibility required an evaluation of Community needs, it cannot be discharged by simply looking to State regulations. It requires an independent evaluation of the whole situation by the federal government.

Moreover, the Community pointed out that the federal government could not through the then pattern of control allow the State to effectively deny Metlakatla any share at all. Some provision had to be made to allow Metlakatla to have its fair share consistent with legitimate conservation considerations.

Accordingly, the Community requested the Secretary to amend the law and its impact on the gillnet fleet, to explore the possibility of opening the reserve to Community gillnetters.

The regulations were then amended and are in the form found in Appendix D.

PART 2

ALTERNATIVE FISHERY OPENING PLANS

This section describes three alternative plans for fishery openings. Alternative 1, the Community Proposal, is based on past fishery openings and run strength. Alternative 2, Projected State Openings, is based on the 1981 ADF&G management plans for salmon openings in adjacent areas. Alternative 3, Community Needs, is intended to provide sufficient volume to the Annette Island Packing Company to fulfill the Community's municipal financial needs.

ALTERNATIVE 1: COMMUNITY PROPOSAL

In recognition of the ADF&G forecasts for 1981, the Natural Resources Committee of the Metlakatla Community Council proposed a system of fishery openings designed to concentrate fishing effort on the stronger runs and to reduce fishing effort on the weaker runs. This schedule of openings, therefore, can be expected to assist the State in its attempts to conserve the weaker runs, while allowing Annette Island fishermen a fair and equitable share of the harvest, and providing the Annette Island Packing Company with sufficient volume to meet Community needs. This section describes the proposed fishery for each gear type, along with the rationale for the opening schedule.

Gillnet Fishery

Of the 33 Annette Island gillnetters, only nine have Alaska limited entry permits. The remainder are restricted to fishing the reserve waters around Annette Island. While State-permitted gillnetters can fish at Tree Point when it is open, and then move north to the District 6 gillnet fishery in north Clarence Strait, and the District 8 gillnet fishery in the Stikine area, the Annette Island gillnet fleet is less mobile. The schedule of openings in the Reserve waters allows for that lack of mobility.

Early pink salmon runs to District 1 streams, expected to pass through Reserve waters in mid-July, are forecast to be weak, primarily due to low escapement levels in 1979. Sockeye, on the other hand, are expected to return in June and early July at levels slightly above average. Middle and late pink runs also are forecast to be in excess of escapement needs. The gillnet fishery on Annette Island, therefore, will concentrate its efforts on the sockeyes and the middle and late pink runs.

The Reserve gillnet fishery will open for five days each week for the four weeks from June 14 through Jly 11, for a total of 20 fishing days concentrating on the strong sockeye runs. If the early pink runs prove to be as weak as forecast, and the State reduces fishing time at Tree Point, the gillnet fishery on the Annette Islands Reserve will be reduced to two days each week

for the three weeks from July 12 through August 1, allowing only six gillnet days during this period. The openings will increase to four days per week for the six weeks from August 2 through September 12, with five-day openings in two of those weeks, bringing the total gillnet openings to 52 days in the 1981 season.

Implementation of this plan will include flexibility to increase or decrease fishing time if the actual run strength differs from the forecast levels.

Purse Seine Fishery

The 12 purse seiners on Annette Island have permits to fish in State waters as well as Annette Island waters. If there is sufficient run strength locally, the seiners might choose to remain in the Annette Islands Reserve. On the other hand, if Districts 1 and 2 are not open, the seiners can fish outside in the Noyes Island fishery.

Because the purse seine fishery concentrates on pink salmon, and because the early pink runs are forecast to be weak, seining in Reserve waters will be managed to conserve the early pink runs. The seine fishery on the Reserve will be open when the seine fishery opens in Districts 1 and 2, which ADF&G expects to be in the last week of July. Seine openings on the Reserve throughout the season will continue to coincide with Districts 1 and 2 openings, unless the Area Director allows additional fishing days based on observed increases in run strength as shown in trap catches as descrbed later in this section.

Regression analysis of ADF&G openings as related to return levels estimates that the purse seine fishery will be open for 16 days in the 1981 season on the Annette Islands Reserve, and 25 days throughout southern southeast Alaska.

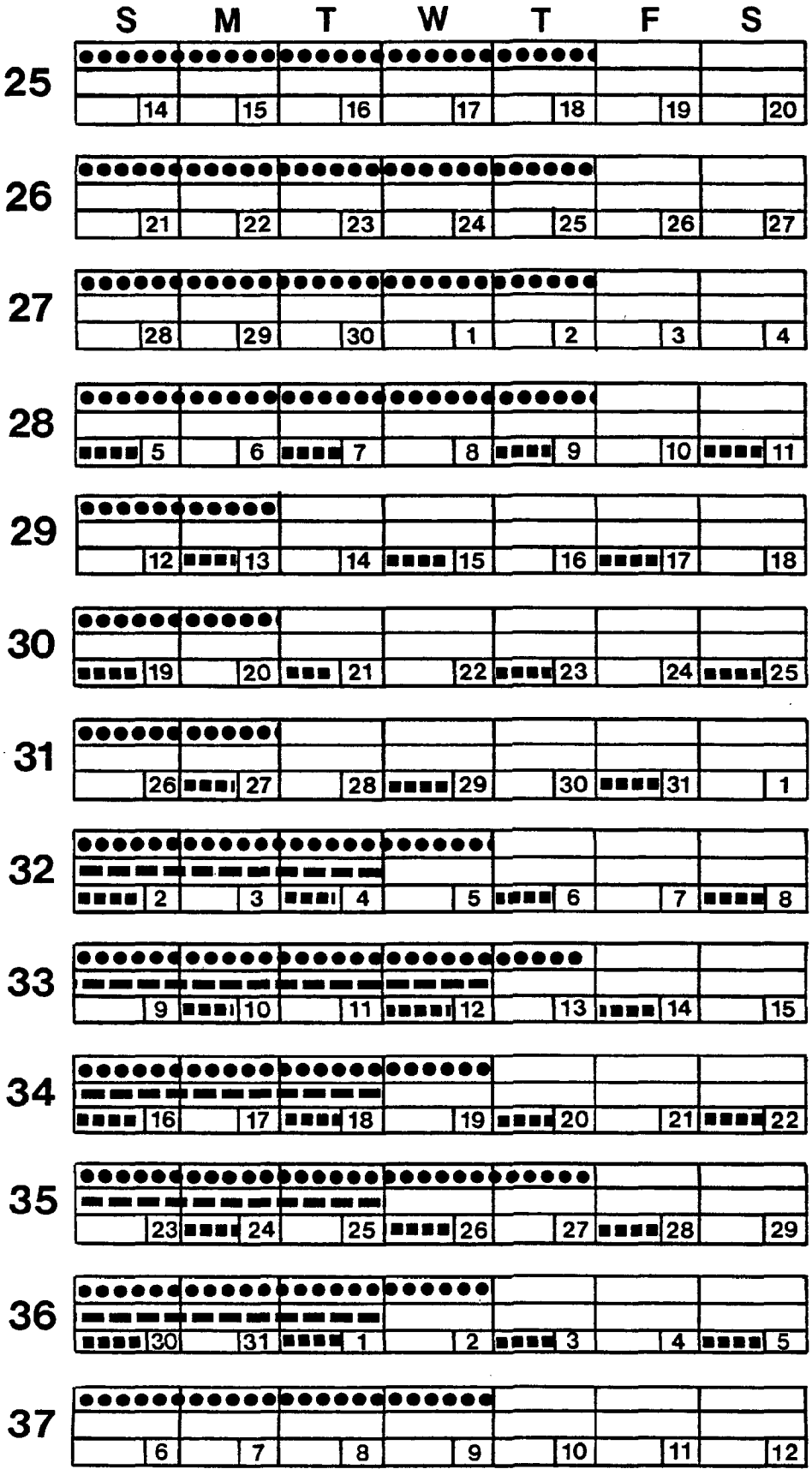
Fish Traps

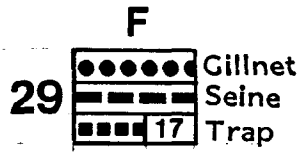
The Annette Islands Reserve, by virtue of its federal reserve status, is the only area in Alaska in which fish traps are permitted. The Metlakatla Indian Community's right to use fish traps was confirmed by the U.S. Supreme Court and is subject to federal regulations enforced by the U.S. Department of the Interior.

The traps are a unique and valuable gear type for the Community. Because they are owned and operated by the Community, rather than by individuals, the proceeds from the trap operations support programs which benefit the entire Community. Because they are more efficient than mobile gear in terms of manpower, fuel, and other costs, the traps can provide for Community needs with fewer fish than can gillnet and seine vessels. Equally important in terms of fishery management, the traps can be used as a consistent, readily available indicator of the size and timing of

1981 State
Statistical Weeks

52 days Gillnetting
16 days Seining
32 days Trap fishing
27 days of no fishing
during the season





ALTERNATIVE ONE
ANNETTE ISLAND FISHING DAYS

salmon runs in the area, since observations can be made whether the traps are actively fishing or not.

ADF&G, in its Salmon Fisheries Management Plan, identified as a major problem, "Inadequate information about stock separation, timing, and migration routes...." Salmon runs entering inside waters are usually monitored by ADF&G-authorized purse seine test sets off Cape Chacon.

The consistency of data gained from these sets is questionable, however, since gear efficiency varies due to differences in skill of the skipper and crew, net condition, weather, tide, and location. On the other hand, since the configuration and "effort" of the traps are unchanging, catch per unit effort data are more consistent. Moreoever, the cost of acquiring the data is considerably less.

In a March 18, 1981, letter to the BIA Area Director, ADF&G Commissioner Ronald Skoog proposed an approach that would "base trap fishing days on inseason assessments of pink salmon run strength." Under this plan, however, the traps will fish at regular intervals, and data from trap catches (and from observations of salmon movement through the traps on closed days) will be used to assess the run strength.

During the period from July 5 through September 5, the traps will be open on alternate days, for a total of 32 trap fishing days. Harvest data will be tabulated daily and will be available to fishery managers at the Annette Natural Resource Center, the BIA and ADF&G to monitor the harvest levels and to evaluate run strength and timing.

Gillnetting and purse seining will not be permitted on the west side of Annette Island when the traps are open. When the traps are closed, the "Sunday aprons" will be used to allow migrating salmon free access through the trap. The Annette Island Packing Company offers no incentive to trap watchmen for high catches, and requires all trap watchmen to observe the "Sunday apron" rule.

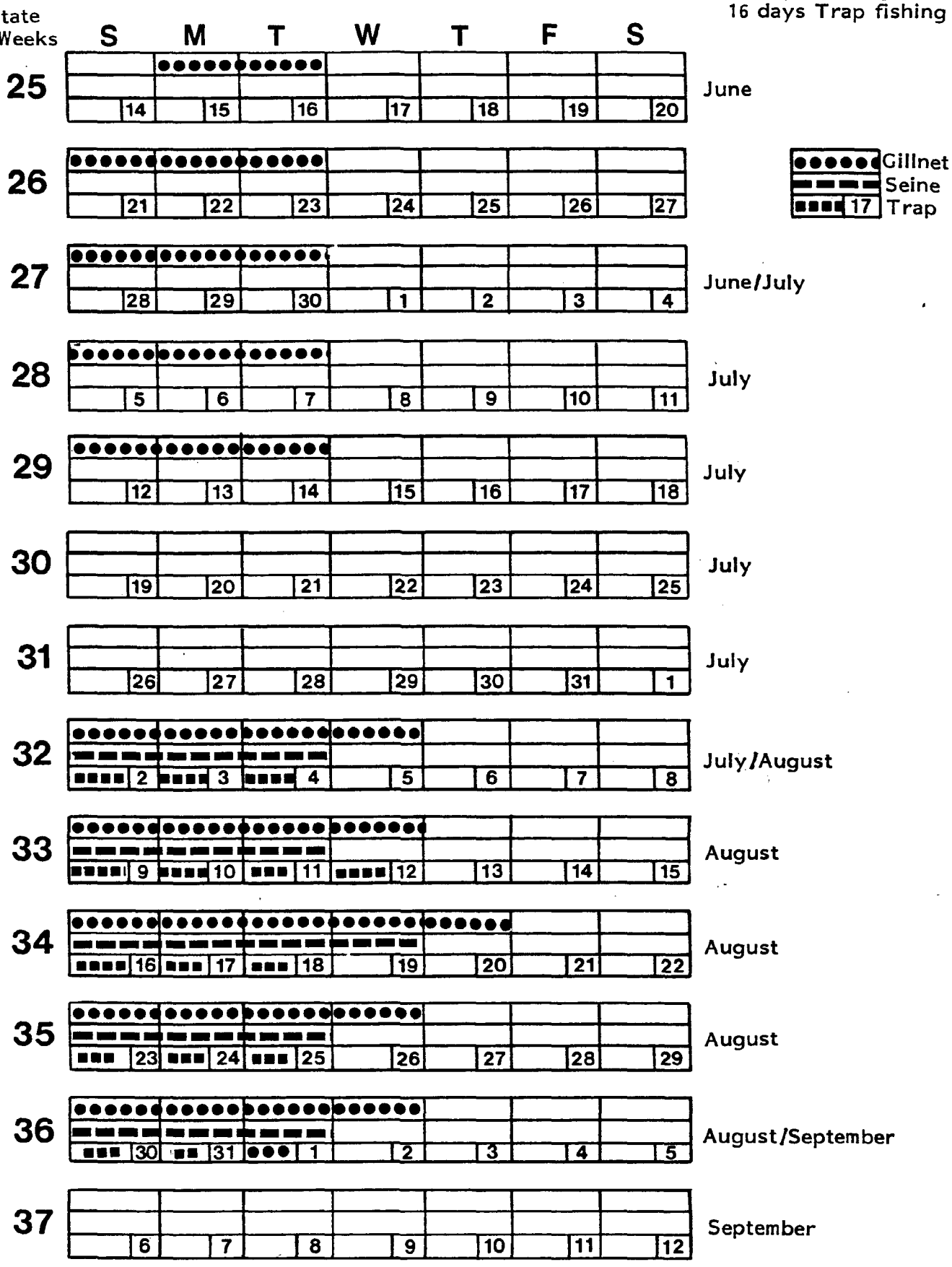
ALTERNATIVE 2: PROJECTED STATE OPENINGS

This alternative is based on the 1981 management plans published by ADF&G for the southeast Alaska purse seine fishery and drift gillnet fishery. Because the Annette Island fishery is automatically open when the fishery is open for a given gear type in Districts 1 and 2, the State management plans for these two districts are considered here.

Purse Seine Fishery

A regression analysis of historical opening days as a function of total south southeastern catch (described in Appendix E) estimates that ADF&G

40 days Gillnetting
16 days Seining
16 days Trap fishing



ALTERNATIVE TWO
PROJECTED STATE OPENINGS
IN ADJACENT AREAS
ANNETTE ISLAND FISHING DAYS

will open Districts 1 and 2 for 16 days in the 1981 season. Early season fishing will probably be outside in District 4, and seining in Districts 1 and 2, according to ADF&G's plan, should begin in late July, and the middle and late pink salmon runs should support good fishing through August. Thus, the 16 days would likely be distributed as one four-day opening and four three-day openings beginning the first week of August and continuing through the week of August 30.

Gillnet Fishery

In the absence of additional days announced by the Area Director, the gillnet openings are tied to ADF&G openings in the Tree Point gillnet fishery. The State's management plan projects an initial three-day opening beginning June 15, followed by four-day openings for the next three or four weeks, depending on the strength of the chum and sockeye returns. ADF&G notes that during the latter part of July, "a closure may be necessary" if early and middle pink runs return at low levels. In this alternative, then, it is assumed that the four-day openings continue for four weeks, but that the fishery is closed during the week of July 19.

Beginning the week of August 2, the gillnet openings projected here are based on Districts 1 and 2 seine openings. The four-day seine openings for the next six weeks would, by ADF&G policy, allow a five-day gillnet opening, and the three-day seine openings would allow four-day gillnet openings. (See ADF&G management plan for additional explanation of openings and policies.)

The gillnet openings under ADF&G management, then, are projected to be 40 days of openings.

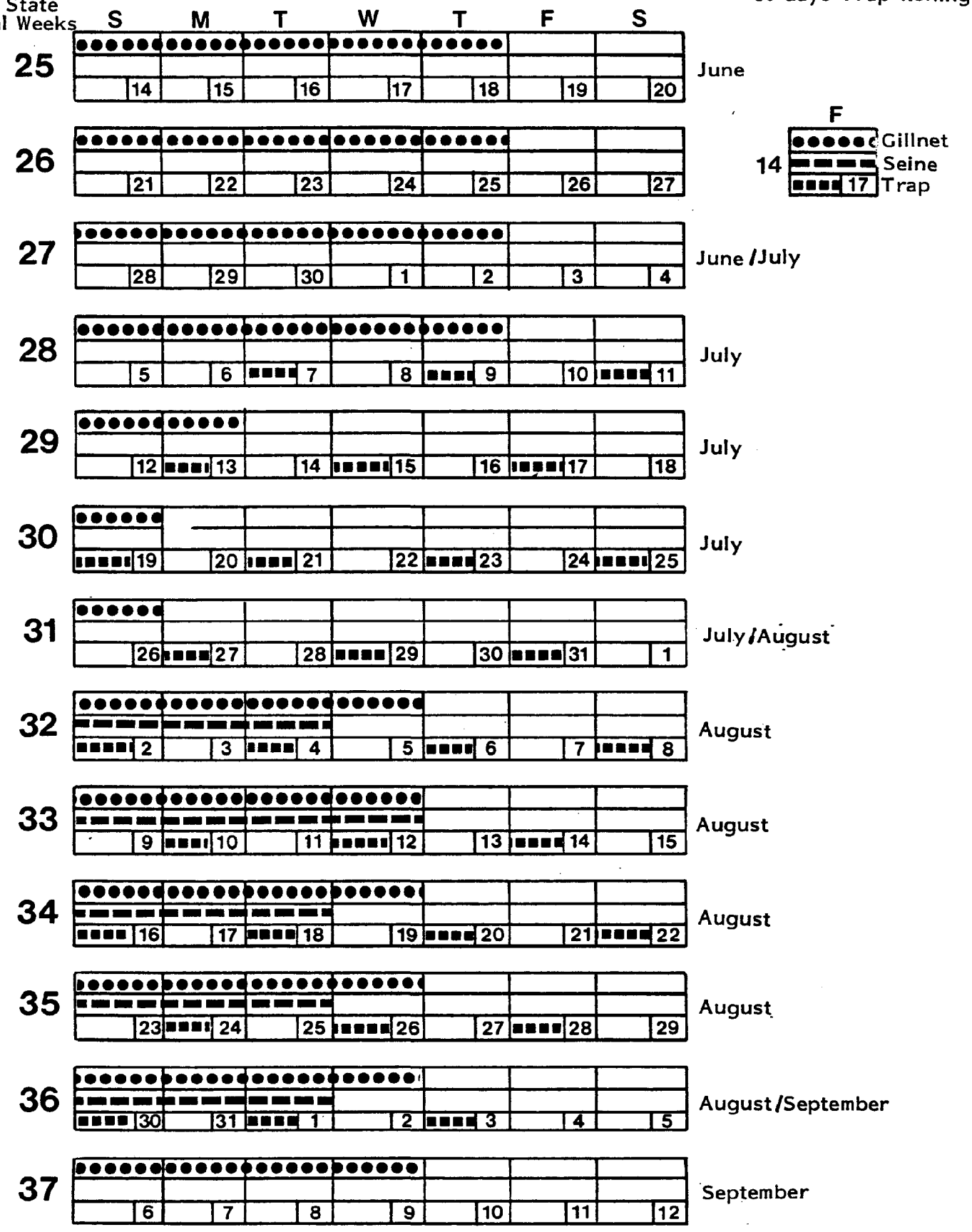
Fish Traps

Although ADF&G does not manage any trap fisheries, the U.S. Department of Interior's regulations allow the traps to open when the purse seine fishery is open in Districts 1 and 2. Under this alternative, then, the traps would be open for 16 days in the 1981 season.

ALTERNATIVE 3: COMMUNITY NEEDS

This alternative schedule of openings is intended to provide a sufficient volume of raw fish to the Annette Island Packing Company to generate the profit needed for the municipal programs and operations of the Metlakatla Indian Community. As is detailed later in this report, the Community will require $1,011,400 in 1981 cannery profits, which, in turn, will require deliveries of 1,257,100 salmon to the cannery.

48 days Gillnetting
16 days Seining
30 days Trap fishing



ALTERNATIVE THREE
FISHING DAYS BASED ON COMMUNITY FINANCIAL NEEDS
ANNETTE ISLAND FISHING DAYS

The schedule of openings under this alternative differs only slightly from that of Alternative 1. The seine openings remain at 16, the projected State seine openings in Districts 1 and 2. The gillnetters would fish 48 days, with the effort reduced during mid- and late July, when the pink runs to District 1 are forecast to be weak. The traps would fish for 30 alternate days beginning July 7.

USING TRAP CPUE AS AN INDEX OF RUN STRENGTH

Earlier in this section the value of the fish traps as a consistent, reliable sampling device was discussed. The traps could prove particularly valuable in this respect if the actual catch per unit effort (CPUE) is compared with seasonal trends in CPUE and with the forecast trap CPUE to indicate the strength of the run. This information, in turn, could help to determine whether additional gillnet or purse seine fishery openings are justified.

Table 1 displays the average weekly CPUE data for the fish traps during the period 1973-1980, and the seasonal magnitude of each week's average CPUE as a percent of the overall average. As the table shows, the CPUE, which can be taken as an indicator of run strength, begins at a low level in the early part of the season, peaks in early August, and then declines as the trap season draws to a close. The peak of the run appears to be somewhat earlier, and is more pronounced, in odd years than it is in all years combined.

TABLE 1
SEASONAL TRENDS IN TRAP CATCH PER UNIT EFFORT
(Number of Fish Per Trap Per Hour)

Statistical Week	1973-1980 Mean CPUE	Overall % of Avg.	Odd Years Only Mean CPUE	Overall % of Avg.
25	--		--	--
26	--		--	--
27	39	30		--
28	52	40	14	11
29	90	69	84	63
30	159	123	247	186
31	172	133	366	275
32	241	186	112	84
33	231	178	132	99
34	135	104	56	42
35	116	89	53	40
36	62	48	--	
All weeks combined:	129.7	100	133.0	100

The trends shown in Table 1 are translated into trap CPUE projections for 1981 in Table 2. Using the average trend for all years*, the table takes the overall CPUE projections developed for 1981 (Appendix E) from ADF&G's return forecasts and applies them to the trends shown in Table 1. The results indicate the levels of CPUE that could be expected if the salmon runs materialize at the ADF&G "point" or medium forecast level, and the levels that could be expected if the runs meet the low end or the high end of the forecast range. Thus, in Week 32 (August 2-8), if the traps catch about 264 fish per trap per hour, the run will appear to be developing according to the "point" forecast for the odd years. If it reaches 306 fish per trap per hour, the run will be reaching the high end of the forecast range, while a CPUE of 230 fish per trap per hour would indicate that the run is developing along the low end of the forecast range.**

TABLE 2
PROJECTED 1981 TRAP CATCH PER UNIT EFFORT
AND RECOMMENDED THRESHOLD LEVELS
(Number of Fish Per Trap, Per Hour)

1981 Average CPUE Using ADF&G Return Forecast	Low 123.6	Medium 142.0	High 164.4
Stat. Week			
27	30	43	49
28	49	57	66
29	85	98	113
30	152	175	202
31	164	189	219
32	230	264	306
33	220	253	293
34	129	148	171
35	110	126	146
36	59	68	79

*There is not enough detailed trap catch data for odd years to make reliable odd-year only projections.

**If the run strength is weak, espected catch per unit effort will be lower than the overall average for all years. Under these conditions, the predictions of total catch associated with the reserve fishery will overestimate the actual catch. Conversely, if run strength is greater, CPUE and total catch of the reserve fishery will be greater.

Finally, the table shows the threshold levels recommended for additional openings. These levels are equal to the high end of the forecast range. If, for example, the trap CPUE in Week 30 exceeds 202, and in Week 31 it exceeds 219, it would appear that the run is developing at a greater level than forecast, and additional seine and/or gillnet openings would be indicated.

PART 3

THE AFFECTED ENVIRONMENT

The chapter describes existing conditions in the environment pertaining to the salmon management plan. It begins with a description of the physical and biological resources of the ares, concentrating on the salmon resource. Then the discussion focuses on the social, economic and financial conditions within which the salmon management plan is operating.

AREA DESCRIPTION

The area most directly affected by the Annette Islands Reserve 1981 Salmon Management Plan (hereafter cited as "SMP") is the Community's Fishery Reserve, a zone extending 3000 feet from the low water line on beachs and rocks exposed (at low water) around Annette Island and its accociated islands and islets (Figure 1). This Fishery Reserve given to the Community by Presidential Proclamation in 1916, will be the location of all the fishing authorized under the SMP.

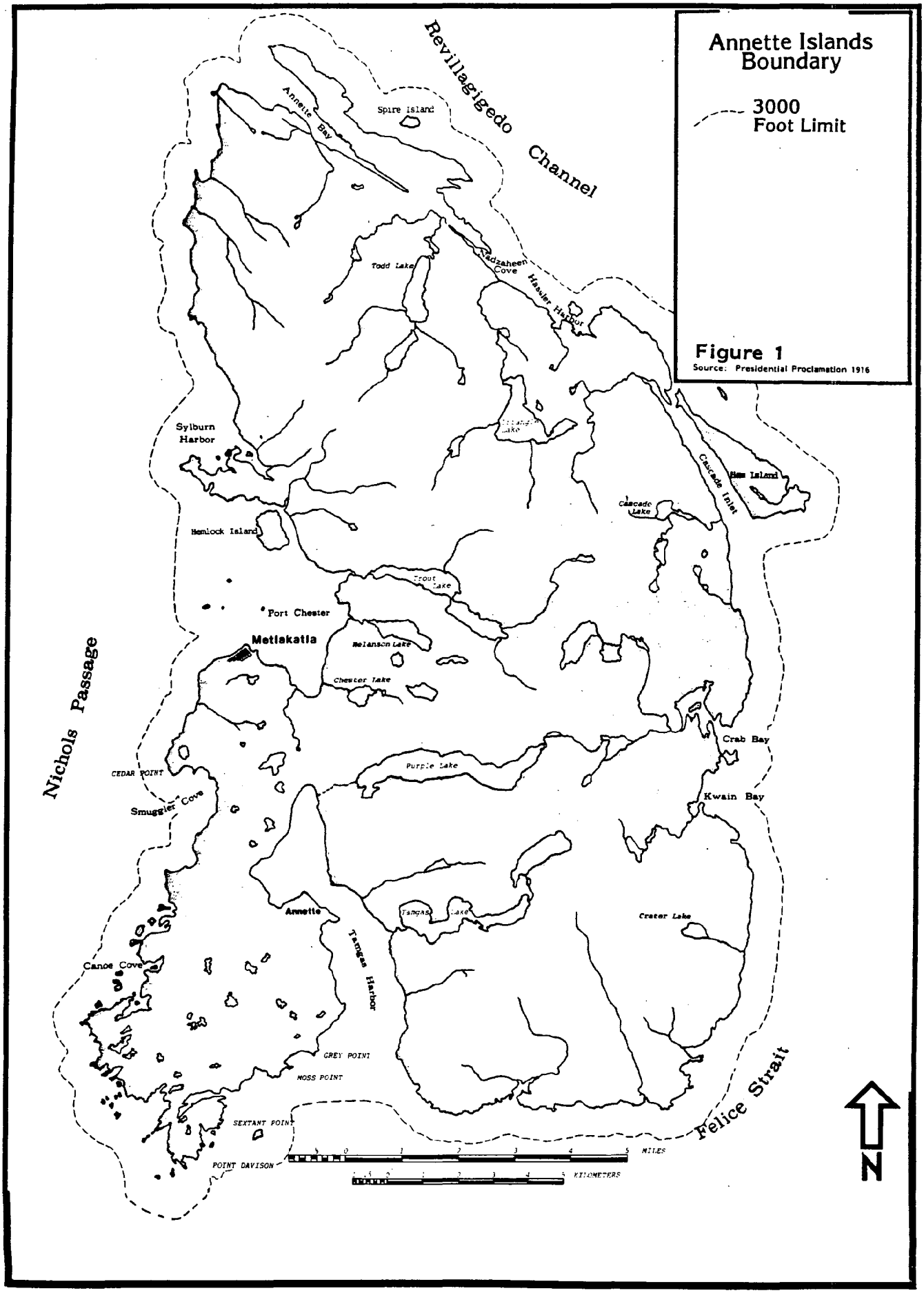
The Fishery Reserve includes over 100 miles of shoreline, with shoreline habitats ranging from shallow protected mudflats to steep rocky cliffs. Depths within the reserve extend to over 300 feet.

Many of the fish harvested in the Fishery Reserve, however, don't spawn on Annette Island, many migrating to Behm Canal, Prince of Wales Island, or as far north as Frederick Sound before reaching their spawning streams. In this assessment, then, the affected environment will be considered as encompassing all the inside waters of southeast Alaska, and the associated salmon spawning streams and lakes.

This assessment concentrates on the water resources and aquatic ecosystems of the area. For detailed information on other aspects of southeast Alaska, the reader is referred to the Tongass Land Management Plan (USDA Forest Service, 1979), which is incorporated here by reference.

Geography

The area under consideration includes the land and waters of southeast Alaska extending east from approximately 136° west longitude and south from approximately 58° north latitude, to the Canadian border (Figure 2). This area includes several hundred islands, collectively termed the Alexander Archipelago, seperated from each other and from the southeast Alaskan mainland by deep, winding, glacially carved channels.


Annette Islands
Boundary
3000
Foot Limit
Figure 1
Source: Presidential Proclamation 1916
Revillagigedo Channel
Nichols Passage
Felice Strait
Annette Bay
Spire Island
Todd Lake
Tadzaheen Cove
Hassler Harbor
Sylburn Harbor
Hemlock Island
Cascade Lake
Cascade Inlet
Hess Island
Trout Lake
Port Chester
Metlakatla
Helanson Lake
Chester Lake
Crab Bay
Purple Lake
Kwain Bay
CEDAR POINT
Smuggler Cove
Annette
Tamgas Lake
Crater Lake
Tamgas Harbor
Canoe Cove
GREY POINT
MOSS POINT
SEXTANT POINT
POINT DAVISON
MILES
KILOMETERS
N

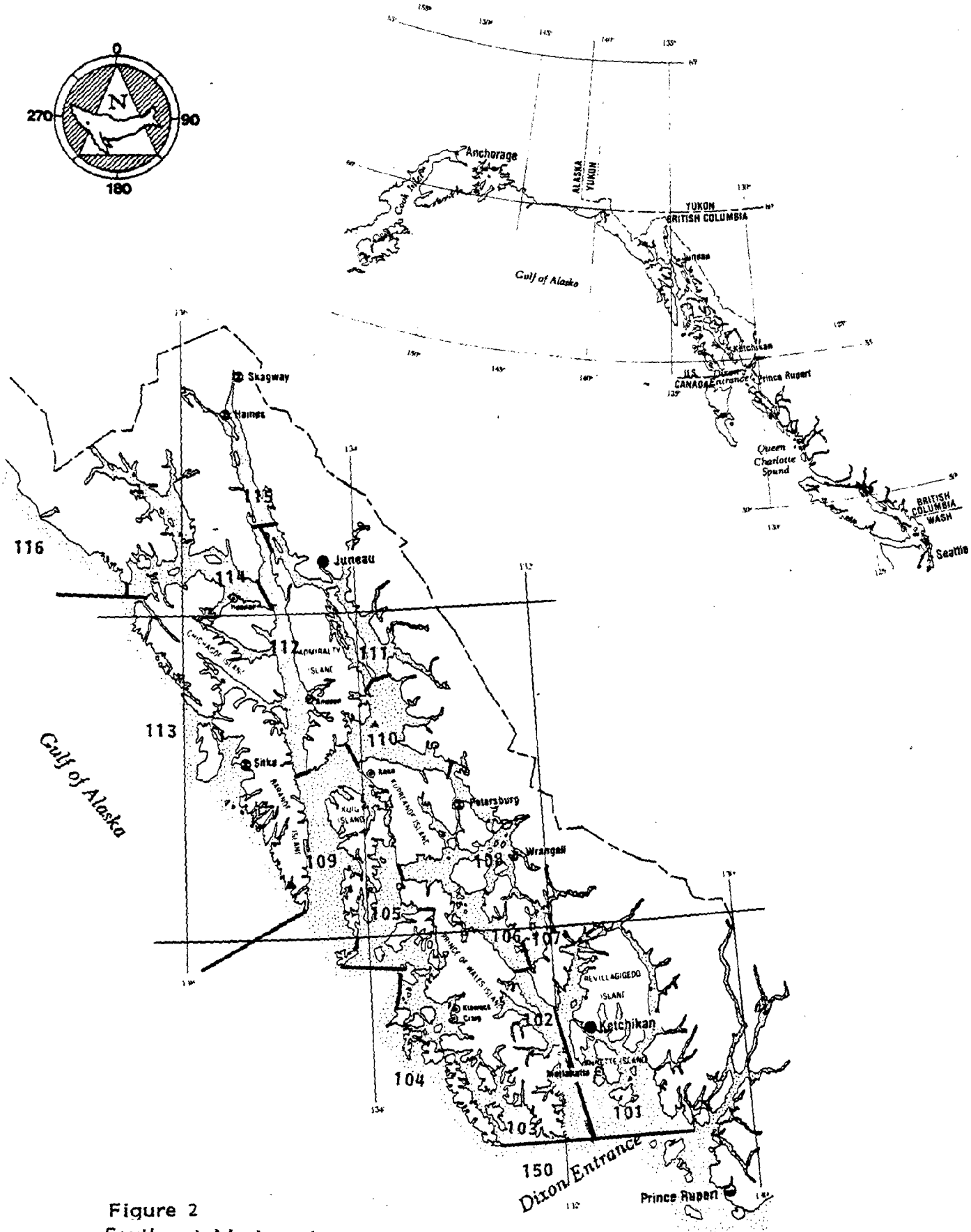


Figure 2
Southeast Alaska, showing ADF&G regulatory areas.

Figures 2 and 3 show A D F & G statistical areas. Southeast Alaska is termed Region 1 (all 100 series), while district number refers to the ones column of the 100 series number (i.e. District 1 is 101, 2 is 102, etc.). The term Southern Southeast refers to districts 101-108, while Northern Southeast refers to 109-115. Higher district numbers (e.g. 152, 182, etc.) refer to outside waters.

Climate

As will be described in following sections the climate of the region strongly affects its salmon production. The air temperature, cloud cover, and precipitation influence the characteristics of the water in which the salmon are spawned and reared.

Maritime weather dominates southeast Alaska. Normal temperatures range from the 40's to mid 60's F. in summer and from the high teens to low 40's F. in winter. In summer, temperatures are cooler on or near the outer coasts while warmer temperatures prevail farther inland; in winter the reverse is true. Temperatures reach extremes in both winter and summer when air masses from Canada override the coastal mountains, bringing clear skies and continental air to the archipelago.

Storms and moderate to heavy precipitation occur througout the year; however, storms are most frequent and precipitation is heaviest from September through November. In winter, snow falls frequently throughout the region, but it usually melts after a few days at lower elevations in southern southeast Alaska. Accumulations of 60 to 100 inches or more are not uncommon in northern southeast Alaska. At higher elevations and around glaciers, more than 200 inches of snow may fall and accumulate each year, perpetuating the ice fields and resulting glaciers. Water is stored principally as glacial ice and winter snowpack.

Surface winds are moderate to strong throughout southeast Alaska. Prevailing winds generally blow from the south or southeast, except where local topography influence wind direction.

Geology, Physiography and Watersheds

Southeast Alaska lies within the broad zone of active volcanism and other mountain building processes which rims the north Pacific basin. The region is characterized by deep valleys, steep slopes and narrow intervalley ridges. Drainage patterns are coarse and strongly controlled by faulting and jointing of the bedrock. Extensive glaciation during the last ice age has modified these features to a large extent, creating characteristic U-shaped valleys, serrate ridges, horn peaks and cirque basins so typical of recently deglaciated terrain. Glaciation and mountain building processes are still active in parts of southeast Alaska today.

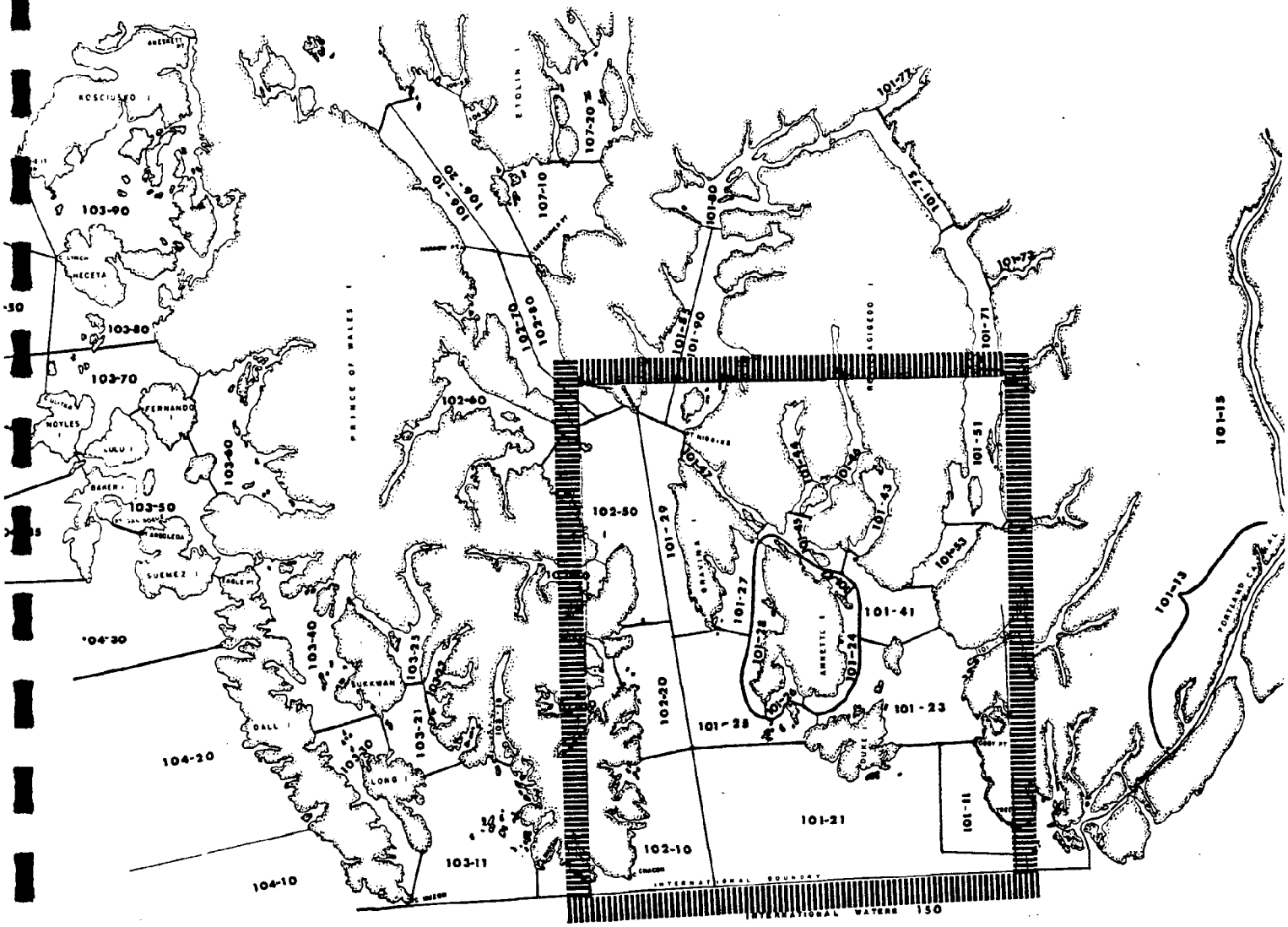


Figure 3

ADF&G STATISTICAL SUB-AREAS IN SOUTHERN SOUTHEAST ALASKA

Area inside rectangle is considered an "adjacent area" to Annette Islands Reserve. When the State opens a fishery in the adjacent area, that fishery is also open in the waters of the Annette Islands Reserve.

Another important feature of the geology of the area is the igneous and metamorphic bedrock which underlies the mainland as well as most of the islands. These crystalline rocks are largely impermeable to the area's heavy precipitation. Unable to percolate into the bedrock, the water must run off, forming the many streams, lakes and muskegs characteristic of southeast Alaska.

The steep glacial topography creates many relatively small drainages. While seven major mainland rivers feed into the fiords of southeast Alaska, there are a great many smaller streams, draining the islands as well as the mainland. Over 800 watersheds drain southeast Alaska with over 1,100 streams supporting salmon spawning and rearing. (Schmiege, et al., 1974)

Streams

In general, southeast Alaskan streams have in common several physical characteristics which influence their ability to support salmon. They have highly fluctuating streamflow rates, varying greatly with precipitation events and snowmelt. They are generally shaded and poor in dissolved nutrients and therefore low in primary productivity, but receive inputs of organic material from overhanging riparian vegetation (Meehan, et al., 1977). The shade provided by riparian vegetation, combined with the area's cool climate, help to keep the stream temperature low, and to maintain relatively high levels of dissolved oxygen. Although these water characteristics vary from stream to stream, the timing of salmon use of the streams takes advantage of times of high flow, with high dissolved oxygen, and low temperatures.

The timing of the salmon spawning run, as well as spawning success and the number of new recruits or smolts that make their way downstream to the ocean, all depend directly on adequate stream flow. If there is a dry spell late in the summer when salmon (expecially sockeye and pink) start migrating to fresh water, the spawning run will be delayed and could result in lowered recruitment (see section on climate). Generally speaking, streams with long stretches of flat, medium-velocity (0.2 to 1 meters per second) waters with gravel substrates are associated with higher spawning capacities and reproductive potentials. Annette Island possesses several of these high productive potential streams.

Adequate streamflow is essential from the time that adult salmon ready themselves in estuaries and stream mouths for upstream migration and spawning to the time that the resultant smolt salmon migrate downstream and seaward. Migration can be hampered by too little streamflow as well as by flooding and torrential rains. Various researchers have established minimum streamflow requirements (Reiser and Bjornn, 1979; Gallagher, 1979) for upsteam salmon migration. Maximum flow rates probably also exist, but are harder to determine (Gallagher, 1979).

Analysis of A D F & G daily and yearly peak escapement records (in areas adjacent to Annette Island) and daily, monthly, and yearly rainfall data, from 1961 through 1980, showed little correlation between pink salmon escapement and rainfall (for July through September, when pinks are migrating). There did seem to be a slight positive correlation between daily rainfall and escapement 2-4 days later, but the relationship was statistically insignificant. Additionally, there was little correlation between total pink returns (catch plus escapement) in Southern Southeast (District 101-108) and late summer, autumn rainfall totals. Gallagher (1979), also, did not find a very high correlation between pink salmon returns (in Puget Sound) and fall brood year streamflow, but what correlation did exist was positive. It appears, therefore, that streamflow rate plays two roles in determining pink salmon production levels: a minimum streamflow is necessary to allow upstream migration; above that level, the increasing flow rate makes more spawning area available (Reiser and Bjornn, 1979; Gallagher, 1979).

Reiser and Bjornn list stream depths and water velocities in actual spawning habitat for most of the anadromous salmonid species and define the optimum spawning flow as "the discharge at which the largest spawning area or usable width occurs." If the relationshop between streamflow and usable spawning habitat is generally known in a drainage system, the information can be used to help estimate stream production potential for any particular year, given the streamflow data.

Rainfall and resultant streamflow can also affect salmon egg incubation, although streamflow requirements of incubating salmonid eggs are largely unknown (Reiser and Bjornn, 1979). For incubating habitat, however, surface flow over gravel must be sufficient to allow fry to emerge; surface velocities should be less than those that displace spawning bed material and scour the redds (salmon "nest" containing eggs); and the apparent water velocity should exceed 20 cm/hour to allow oxygen in water to reach eggs (Reiser and Bjornn, 1979). Beds that do not pass the criteria, can be discounted from the stream salmon production estimate.

A final influence of streamflow on salmon production is that of preventing freezing. Low temperatures during winter months can be devastating to eggs in gravel, alevins (sac-fry) and to small fry in shallow parts of streams if freezing occurs. High streamflows can often counteract the deleterious effects of low temperatures by preventing freezing.

Lakes

Southeast Alaska has hundreds of lakes, ranging in size from small, shallow ponds of standing water in the muskegs, to deep, glacially carved lakes several square miles in area. Some of these lakes serve as spawning and rearing habitats for coho and sockeye salmon, but they have limitations on their productivity.

Like the streams, they tend to be poor in dissolved nutrients. The cold water of the higher lakes, while maintaining a high level of dissolved oxygen, can slow the growth of fish, and of the organisms upon which they feed. Finally, while many lakes meet the habitat requirements for salmon spawning and rearing, they are inaccesible to salmon migration due to log jams, waterfalls, or other obstacles in their outlet streams.

On Annette Island, lakes as well as streams, will be monitored for escapement. Trout Lake and Tamgas Lake (see Figure 1) currently produce sockeye salmon. Also Trout Lake is being considered for possible enhancement by fertilization to increase sockeye production in the near future (Pacific Rim Planners, Inc., 1980).

Estuaries

The area's climate and runoff characteristics influence the estuarine waters as well. The inside waters of southeast Alaska generally conform to Pritchard's (1967) definition of an estuary as a semi-enclosed body of water, strongly affected by tidal action, having a free connection with the open sea, in which seawater is measureably diluted by fresh water derived from upland runoff.

In diluting the seawater, the freshwater creates a layering effect in the estuaries, with the less dense low-salinity water flowing out at the surface, replaced by more dense high-salinity water flowing in at depth. The deeper water has a high nutrient content and promotes a high level of primary productivity of plankton and benthic algae in the estuaries.

This primary productivity, converted through estuarine food webs, provides the food supply that supports juvenile salmon in their outmigration towards the ocean. Benthic invertebrates as well as plankton contribute to the food of juvenile salmon in the area. Food availability in an estuary can strongly affect the salmon recruitment that results from that estuary. In 1981, the Annette Natural Resource Center staff will examine estuarine productivity more closely, to quantify their effect on overall Annette Island salmon production.

RESOURCE DESCRIPTION

All five species of Pacific salmon are fished in the waters of the Annette Islands Reserve, and four species are produced in the streams and lakes of the reserve. Figure 4 shows the major salmon streams on Annette Island and also the particular species utilizing each stream. This section will describe the salmon resource of the area in terms of the life cycles and ecological interactions of each species, and the commercial fishery that accounts for the most of the use of this resource.

Pink or Humpy Salmon *(Oncorhynchus gorbuscha)*

The smallest of the Pacific salmon species, pinks generally average less than four pounds in the commercial fishery, although mature adults have been weighed at up to 15 pounds. Although they are the smallest, pink salmon are the most numerous, accounting for 73.2 percent of the commercial harvest, by number, in the period 1979-1979 in southeast Alaska.

After hatching from eggs in the stream gravel, pink salmon fry migrate downstream in the spring, preferring sheltered, vegetated areas or traveling at night to avoid the light. In the marine environment, young pinks remain in the shallows both to feed on small invertebrates and to escape larger predatory fish.

In the fall of their first year, pink salmon leave the shallows and head out to sea, eventually migrating as far as 500 miles from shore. At sea they feed on small swimming crustaceans, fish and squid.

Pinks return to inside waters at the age of two, and are fished in seine and gillnet fisheries during their passage to the spawning streams. Pinks are also taken by trollers, although they are not the target species. The heaviest runs of pinks in the southeast Alaska fishery return in even-numbered years, although this is not a steadfast rule. Large runs have occurred in odd years, and small runs in even years. The success and failure of an entire fishing season can depend on the size of the pink salmon return; however, prices are also an important determining factor in the success or failure of the season, as was illustrated in 1980. The return of pinks was excellent, but the price was low; as a result, much of the harvestable surplus of pinks were left unharvested in the fall fishery.

Those escaping the commercial and subsistence fisheries swim upstream, sometimes swelling the streams with their numbers. Because the fry do not remain in the streams long after hatching, pinks can spawn in small streams which may be dry in the summer. Almost any stream with sufficient fall and winter streamflow, a gravelly streambed, and a coarse free of obstacles can support pink salmon. At least 29 streams on Annette Island have been documented as producing pink salmon.

Their short residence time in freshwater makes pink salmon ideal for hatchery production, since they can be released shortly after hatching, and thus have no feeding requirements. They are therefore produced in hatcheries throughout southeast Alaska, including the Tamgas Creek Hatchery on the reserve.

Chum or Dog Salmon *(Oncorhynchus keta)*

The other species with a short residence time in freshwater, chum salmon, like the pinks, migrate downstream directly to saltwater when they emergy from the streambed gravel. They spend the first summer feeding on small

invertebrates in inshore shallow areas, and move into deeper water in the fall. Feeding on invertebrates continues as the chum range out over the Pacific Ocean, sometimes travelling parallel to the coast as far north and west as the Aleutian Islands.

After three to four years at sea they return to their spawning streams, which range in size from large rivers to small streams. The presence of a gravel bottom is necessary for spawning, and many pink salmon streams in southeast Alaska also support chums. Because of their short freshwater residence, chums, like pinks, are relatively easily adapted to hatchery production with minimal feeding; however, extended holding and feeding in hatcheries (especially in brackish water to full strength seawater) produces larger fry for saltwater release, with a greater chance of survival in the marine environment. At least 23 Annette Island streams produce chum salmon, as does the Tamgas Creek Hatchery.

Returning to southeast Alaska, chum salmon contribute to the seine, gillnet and trap fisheries, where they average over nine pounds per fish. Between 1970 and 1979, chums made up 11 percent, by number, of the total catch in southeast Alaska. Chums are usually canned, or on a smaller scale, they are smoked.

Sockeye Salmon *(Oncorhynchus nerka)*

A highly valued species, sockeye have perhaps the most specific freshwater habitat requirements. Newly-hatched sockeye fry have habits similar to those of pink salmon, avoiding light and hiding during the daylight. Unlike the other four species, sockeye generally spend the first year, or more, of their lives in a lake, where they feed on insects, insect larvae and small crustaceans. They are therefore highly dependent on the productivity of the lakes for their food supply, as well as on the temperature and dissolved oxygen content for their overall survival. Research in lakes in British Columbia has found better survival and larger fish produced in lakes with suitable nutrient levels and primary productivity than in the nutrient-poor lakes common throughout southeast Alaska. Initial experiments with lake fertilization have proved quite promising, however in enhancing sockeye runs. Two lakes on Annette Island support sockeye runs, and a current study recommends a feasible program of lake fertilization for Trout Lake, on Annette Island.

After leaving the rearing lakes and migrating into saltwater, the sockeye remain inshore, often near a stream or river mouth. After the first summer in saltwater they migrate into the ocean and have been recorded as far out as the western Aleutian Islands. The invertebrates that make up the diet of young sockeye are supplemented in later life by fish, including herring, sandlance and other species. Maturing at four to five years, they return to southeast Alaska, where they contribute 5.7 percent of the total catch (1970-1979). Often averaging about six pounds per fish, sockeye are processed into a high quality canned product, although they can also enter the market processed fresh-frozen.

Coho or Silver Salmon *(Oncorhynchus kisutch)*

Another highly valued species, coho are produced in the headwaters of large rivers as well as in small streams. The juveniles spend up to two years in streams and lakes. They therefore depend on adequate streamflow and water quality throughout the year, although some coho streams are so small as to appear insignificant. At least 17 streams and lakes on Annette Island are used for spawning and rearing by coho.

On entering saltwater they feed heavily for fast growth, eating both fish and invertebrates. Coho may migrate up to 100 miles offshore in the ocean, and as far north as the Aleutian Chain, usually returning in their third and fourth year; although, small coho jacks (precocious one-ocean year males) are often in the returning run. Mature adults returning to their spawning grounds may spend several weeks in the estuaries before moving upstream.

Averaging between six and eight pounds in weight, coho are taken in the seine, gillnet, and trap fisheries; however, because of their active feeding habits, they are the mainstay of the troll fisheries, both offshore and in inside waters. Overall, they made up 7.7 percent of the southeast Alaska salmon catch, by number in 1970-1979. Some coho are canned, but their high-quality meat makes them ideal for marketing in fresh frozen form.

Coho are produced in hatcheries (including the Tamgas Creek Hatchery) but their needs for freshwater rearing require a good deal of feeding, which increases the cost of hatchery production. Among other enhancement measures used for coho in southeast Alaska is lake rearing, in which hatchery produced coho fry are planted in a suitable lake which does not have an indigenous coho run.

Chinook or King Salmon *(Oncorhynchus tshawytscha)*

The largest of the Pacific salmon, kings are the one species which does not originate in Annette Island. With few exceptions, kings in southeast Alaska spawn only in the rivers of the mainland. Kings may live in the river systems for the first year of their lives. They then migrate to the marine environment and remain until the age of three to five, although some do not return to spawn until seven years of age, and some return as jacks (one ocean-year old precocious males).

Because king salmon swin and feed near the bottom, they generally evade the net fishery; however, their feeding habits make them ideal for the troll fishery for fishermen who are skilled in trolling along the bottom. In 1980, 93.3 percent of the kings landed in southeast were caught by commercial trollers. Because growth continues throughout their migration, delay of capture until the later stages of their lives in inside waters yields a larger product than does fishing immature kings by offshore trolling.

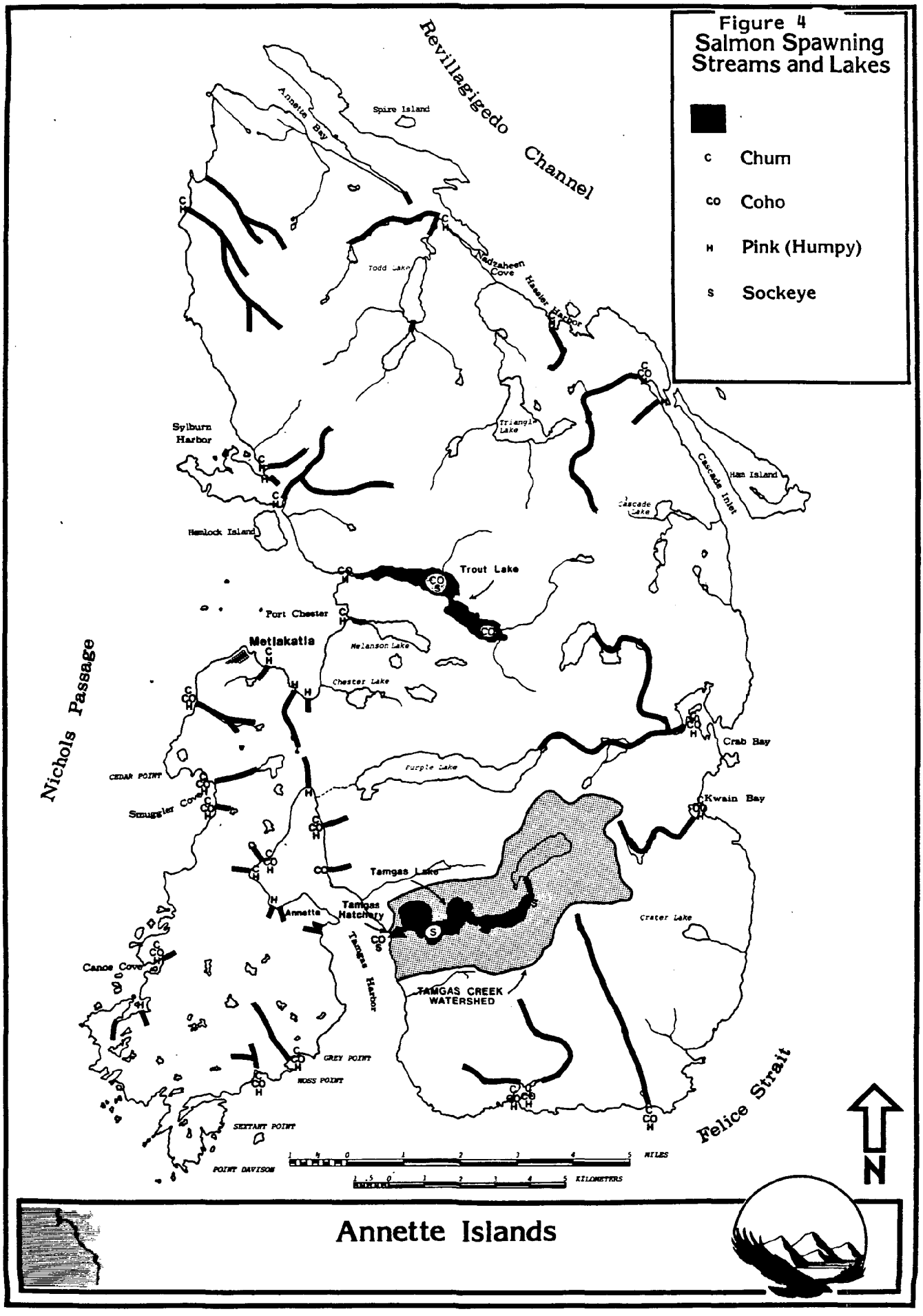


Figure 4
Salmon Spawning Streams and Lakes
C Chum
CO Coho
H Pink (Humpy)
S Sockeye
Revillagigedo Channel
Annette Bay
Spire Island
Todd Lake
Tadzaheen Cove
Hassler Harbor
Sylburn Harbor
Triangle Lake
Cascade Inlet
Han Island
Cascade Lake
Hemlock Island
Trout Lake
Port Chester
Metlakatla
Melanson Lake
Chester Lake
Nichols Passage
Crab Bay
CEDAR POINT
Purple Lake
Smuggler Cove
Kwain Bay
Tamgas Lake
Annette
Tamgas Hatchery
Crater Lake
Canoe Cove
TAMGAS CREEK WATERSHED
Tamgas Harbor
GREY POINT
MOSS POINT
SEXTANT POINT
POINT DAVISON
Felice Strait
MILES
KILOMETERS
N
Annette Islands

Averaging over 13 pounds per fish, king salmon made up only 1.7 percent of the overall catch in southeast Alaska in 1980, a reflection of both their relative abundance, and the small proportion of the total catch taken by trollers. With the highest value per pound, king salmon are sold fresh, or fresh-frozen and are sometimes smoked, then canned or packaged.

Annette Island Salmon

Four of the five species of Pacific salmon spawn on Annette Island. Figure 4 shows the major spawning streams on the reserve and the species utilizing each lake or stream. Pink and chum salmon make up the bulk of the escapement count. Coho are produced in smaller numbers and sockeye are restricted to Tamgas Lake and Trout Lake.

Table 3 shows the results of the 1980 escapement surveys in selected Annette Island streams. These figures should be considered only partial because a great deal of effort would be required to survey each stream. They are, however, more complete than A D F & G's historical data, which combine Annette Island escapement figures with those in adjacent subdistricts, and then attribute little or no production to Annette Island. More detailed escapement data for the reserve are available from the Annette Natural Resource Center. Escapement surveys in 1981 will devote greater effort and can be expected to produce more complete data for Annette Island streams.

Table 3
Annette Island
1980 Salmon Escapement Counts
Peak Surveys

Creek or Lake	Escapement and Species	Survey Date
Tamgas Lake	60 sockeye	8/ 6/80
Trout Lake	under 400 sockeye	7/30-8/15/80
Tamgas Harbor (spawning in adjacent creeks)	9,200 mostly pinks (mixed, chums)	9/ 7/80
Kwain Bay Creek	6,000 mostly pinks (mixed, chums)	9/ 7/80
Crab Bay Creek	4,000 pinks	9/ 7/80
	500 chums	
Cascade Creek	1,000 mostly pinks (mixed, chums)	9/ 7/80
Nadzaheen (weir)	42,000 pinks	9/ 7/80
	1,100 chum	
	500 coho	
Japan Bay South Creek	1,500 mostly pinks (mixed, chums)	8/15/80
Hemlock (weir)	1,000 pinks	8/15/80
	200 chum	

Uncounted Creeks

Campbell Creek
Net Point Creek
Chum Creek
Annette Bay Creek
Canoe Cove Creek(s)
Japan Bay North Creek
Seagull Creek (Melanson Lake Creek)
Davis Creek
and others

TOTALS

500 sockeye (approximate)
500 coho
64,700 pink
1,800 chum

SOCIOECONOMIC SETTING

The Metlakatla Indian Community is composed primarily of Alaskan Natives. The first settlers of Metlakatla in 1887 were members of the Tsimpshean Nation. Later, other Alaskan Natives joined the settlers; as a result, the Metlakatla Indian Community now includes Tsimpshean, Tlingit, Haida, Eskimo, Aleut and other Alaskan Natives.

The U.S. Congress formally recognized the Community in 1891 by creating the Annette Islands Reserve, a Federal Indian reservation. This action set aside the island for the exclusive use and occupancy by "Metlakatla Indians." In 1916, the reserve was enlarged by Presidential Proclamation to include the waters surrounding Annette Island for a distance of 3,000 feet.

Population

Until the founding of the Metlakatla Indian Community, there was no permanent or year-round population on any of the islands of the reservation. The founding of the Community in 1887 brought rapid growth; in 1890 the population was 823. During the next 40 years, the size of the Community's population fluctuated, reflecting uneven success in establishing a stable social and economic base.

As in many other parts of the Southeast Alaska, much of the early population growth of the Community can be traced to the years, the Community's economy has diversified and grown to the point where salmon no longer solely determines size and success of the Community; the salmon industry still plays a major role, however, as will be discussed later.

Since 1930 the level of population has shown fairly steady increases, the sole exception being a small decline in the 1950's. A 1976 Community census estimated the population in Metlakatla alone at 1,320 in 1977. (Pacific Rim Planners, Inc., 1977)

Until the 1940's there was no appreciable population on any other parts of Annette Island outside Metlakatla, or on any of the other islands of Annette Islands Reserve. In 1941, the Army Air Force established an air base on the southern end of the Metlakatla Peninsula at the present site of the Annette Airport. At the close of World War II, as Air Force functions declined, the facility came to be used as a Coast Guard Air Station and a civilian airport for the Ketchikan area. Population of the Annette area stood at 317 in 1960 and 750 in 1970. Relocation of civilian airport activities to the new Ketchikan Airport in 1973 and of Coast Guard Air Station activities to Sitka in 1977 have now reduced population in the areas outside of Metlakatla to about 120 persons.

Economy

The Annette Islands Reserve is an important participant in the regional economy of southern southeast Alaska. This regional economy posseses three basic characteristics which must be considered in the design and implementation of the Salmon Fishery Management Plan.

First, the area is characterized by a dominant trade center located at Ketchikan, twenty miles north of Metlakatla. As might be expected, this economic center attracts a large volume of business from residents in outlying communities. In the case of Metlakatla, the attraction is particularly strong. Indeed, a 1977 study of local spending patterns indicates that over 30% of all household expenditures leak off the Annette Islands Reserve to retail outlets and service enterprises in Ketchikan. (Pacific Rim Planners, Inc., 1977)

The regional economy is also characterized by the small size and relative isolation of local markets. The Ketchikan area including the reserve encompasses some 8,500 square miles of land set in a maze of inland waterways. The population within this area barely exceeds 15,000 people distrubuted among 13 small communities. The isolation and scarcity of potential consumers thus greatly limits the range of economically viable activities.

The third basic characteristic of the region's economy involves its heavy reliance upon exploitation of natural resources. This aspect mentioned in passing, however, that regional employment is concentrated in commercial fishing and fish processing activities, and in logging, and pulp manufacturing, industries. Indeed, these two sectors alone account for 70% of all primary (i.e., basic sector) employment throughout the region (Rogers and Hart, 1978)

LEGAL AND POLITICAL SETTING

The Annette Islands Reserve is a unique social and political entity. Its organization, and the legal and political environment within which it operates, weigh heavily on all development and particularly affect the design and implementation of the salmon fishery management plans.

Three aspects of the Community's legal and political setting--the Community's relationship with the Federal government, its relationship with the State of Alaska and its organization--are important to consider, for they provide an understanding of the Community's unique capabilities, constraints and motivation for carrying out fishery management. Each aspect is discussed separately beginning on the following page.

Relationship with Federal Government

The Community did not participate in the Alaska Native Claims Settlement Act and the nature of federal responsibilities is quite unlike that of the government toward other Alaskan Natives; this distinction is important to consider as it outlines a unique federal role and responsibility in the management ofthe Annette Islands Fishery Reserve.

The federal government set the Annette Islands Reservation apart from other federally owned land in southeast Alaska by Section 15 of the Acy of March 3, 1891 (26 Stat. 1101, 48 U.S.C. Sec. 358), enlarging it in 1916 to include the area identified in the Presidential Proclamation of April 28, 1916 (39 Stat. 1777), as the waters within 3,000 feet from the shoreline at mean low tide of Annette Island, Ham Island, Hemlock Island, and adjacent rocks and islets.

When Congress was considering the Alaskan Native Claims Settlement Act, Metlakatla was given an opportunity to end its reservation status and participate in the settlement with other Alaskan Natives. The settlement would have provided substantial payments of land and money to the Community in return for termination of federal trust responsibilities. The Community, however, through its attorneys and by a special delegation sent to the congressional committee considering the bill, requested that its reservation be kept intact and that the trust relationshop between the reservation and the United States government continue. Thus, the Metlakatla Indian Community was excluded from the provisions of the Alaskan Native Claims Settlement Act (PL 92-203) as provided by Section 19 of the Act.

The regulations compiled for the Annette Island's Fishery Reserve are a function of and define the trust responsibility of the federal government to Metlakatla. According to Title 25 CFR 88.3 (e), the Secretary of the Interior has the Authority to allow the community to fish commercially, within the reserve, and/or when adjacent state waters are open (the decision being based on the three criteria listed in "Purpose and Need for Action").

The Indian Tribes have always possessed under the laws of the United States the status of "distinct, independent, political communities" and, as such, have been recognized as capable of excersing governmental authority by virtue of their original sovereignty. Worcester V. Georgia, 5 Peters (U.S.) 515, 519 (1832).

The Cherokee cases first defined the nature of the federal relationship to the Indian tribes. The Supreme Court in those opinions concluded that, although the relationship is unlike any other, it resembles that of a ward to his guardian. Because the relationship is so unique, the Court explained it in terms of a more readily understood metaphor, which it further expanded by describing the attitude of the tribes and the United States toward each other:

> *They look to our government for protection; rely upon its kindness and its power; appeal to it for relief of their wants; and address the president as their great father.*

They and their country are considered by foreign nations, as well as by ourselves, as being so completely under the sovereignty and dominion of the United States a political connection with them, would be considered by all as an invasion of our territory and an act of hostility.

The truly unique feature of the relationship is that it also recognizes the internal sovereignty of the tribes:

The settled doctrine of the law of nations is, that a weaker power doen not surrender its independence--its right to self-government--by associating with a stronger, and taking its protection. A weak state, in order to provide for its safety, may place itself under the protection of one more powerful, without stripping itself of the right to government, and ceasing to be a state.

In general, the relationship is that of a stronger to a weaker government. The Congress, under principles of constitutional and international law, has plenary power over the tribes.

This unequal relationship imposes obligations on the federal government variously described as obligations of "fairness," "trust," and "guardianship." Of the relationship of the Supreme Court has said:

The recognized relation between the parties (the United States and the Choctaw Nation) is that between a superior and an inferior, whereby the latter is placed under the care and control of the former, and which, while it authorizes the adoption on the part of the United States of such policy as their own public interest may dictate, recognizes, on the other hand, such an interpretation of their acts and promises as justice and reason demand in all cases where power is exerted by the strong over those to whom they owe care and protection. The parties are not on equal footing, and that inequality is to be made good by the superior justice which looks only to the substance of the right, without regard to technical rules framed under a system of municipal jurisprudence, formulating the rights and obligations of private persons, equally subject to the same laws.

Thus the supremacy of federal power over Indian tribes creates a dependency and reliance requiring generally that the federal government adhere to an "overriding duty...to deal fairly with the Indians wherever located," and imposes a distinctive obligation of trust incumbent upon the government in its dealings with these dependent and sometimes exploited people. Similar reasoning supports rules of statutory construction requiring statutes passed for the benefit of Indians to be liberally interpreted and those terminating the federal relationship to be narrowly construed.

The relationship of the federal government to Indian tribes is difficult to define in general terms because the obligations of the government inherent in the relationships vary with time and specific subject. These obligations have sometimes been termed "trust responsibilities," but the term is not wholly satisfactory.

"Trust responsibility" refers most accurately to obligations arising from a divided property interest in which one party holds and manages the legal interest in property for the equitable benefit of another. The United States frequently does have a trust responsibility over Indian resources and that responsibility frequently requires that funds obtained from the sale or lease of those resources be used to provide for specific services. Under these circumstances, it can be said that the United States has a "trust responsibility" to provide the agreed upon services. However, the courts have not been especially careful in their use of the term "trust" and have implied "obligations of trust" where no property relationship exists.

Suffice it to say that between the federal government and the tribes there is a unique relationship. That relationship is founded on principles of constitutional, international and common law and the dependency of the tribes on the federal government's plenary power. They are dependent on the federal government to protect their lands, they depend on the government to provide important human services when the states refuse or are unable to do so. They are dependent on the government to protect their resources and tribal government from state encroachment.

Tribal dependency alone is not sufficient to impose legally enforceable obligations on the United States. Such obligations must first be acknowledged in treaties, statutes, appropriations, executive actions and clear common law principles. The statute setting aside the Annette Islands Reservation, the Executive Order setting aside the Fishery Reserve and the regulations governing fishing in the reserve are acknowledgement and definition of the federal relationship to the Metlakatla Indian Community.

Relationship with the State of Alaska

The Community has a unique relationship with the State of Alaska. The Community has a great deal of autonomy to determine the use of its own resources. For example, the fishery reserve adjacent to Annette Islands is managed for the benefit of the Community. State management plans and regulations are usually consulted, but the management decisions are left with the Community subject to the approval authority of the Secretary of the Interior, through B.I.A. (as required by the federal regulations).

In 1959, Alaska became a state. On April 17 of the same year the new state adopted a comprehensive fish and game code and thereafter assumed complete control over natural resources. As part of its fish management scheme, the state absolutely banned the use of fishtraps withing its borders. The then governor, William Egan, informed the Native communities

within the state that the use of fishtraps, even with the permission of the Secretary of the Interior, was illegal. The Natives refused to give up the traps; some were arrested. Two law suits were filed by the Native communitities. The villages of Kake and Angoon jointly filed a suit to enjoin the state's enforcement of the code *(Kake v. Egan)*. The Metlakatla Indian Community sued for an injunction on the same grounds *(Metlakatla v. Egan)*. Both Kake and Metlakatla argued that Alaska, under Section 4 of the Statehood Act, had disclaimed all right and title to:

> *Any lands or property (including fishing rights); the right or title to which may be held by any Indians, Eskimos, or Aleuts...or is held by the United States in trust for said Natives.*

The United States, according to Section 4, "retained absolute jurisdiction and control" over such Native property.

Metlakatla was distinguished from *Kake* by the fact that Metlakatla had been set aside as a reservation by act of Congress and under the regulatory authority of the Secretary of the Interior. Neither Kake nor Angoon had been reservations nor was there any statutory authority for the Secretary of the Interior to permit them to operate fishtraps contrary to state law. Thus, the Supreme Court held that state regulation of fishing at Kake and Angoon did not interfere with any Indian property right because regulation was only the exercise of the state's governmental authority over the fishery resource.

The Court concluded that the people of Kake and Angoon only had aboriginal rights in fish and not over the waters in which the fish swam. Therefore, the state could regulate the exercise of these aboriginal rights in the absence of andy federal law to the contrary. Thus, the deciding factor in each case was the extent to which the Indian communities had been brought under the protective principles of federal Indian law through the reservation system or pre-emptive federal legislation. Absent either reservation or pre-emptive federal legislation, the Court concluded that the State of Alaska had jurisdiction over the activities of Natives on state waters. So long as it did not intrude on federally reserved waters, the state could regulate aboriginal rights to fish:

> *Even on reservations state laws may be applied to Indians unless such application would interfere with reservation self-government impair a right granted or reserved by federal law.*
>
> *But state regulation of off-reservation fishing certainly does not infringe on treaty-protected reservation self-government...nor have appellants any fishing rights derived from federal laws.*

The Court confirmed federal and (by implication) Metlakatla Indian Community control over the waters of the Annette Islands Fishery Reserve. In 1963, immediately following the Supreme Court's decision, the Secretary of the Interior promulgated part 88 of Title 25 of the Code of Federal Regulations governing fishing in the Annette Islands Fishery Reserve.

Community Organization

The founders of Metlakatla emphasized cooperation in all aspects of community development. Resources owned in common, and many Community-owned business enterprises were started, including a sawmill, a machine shop, a hydroelectric plant and a fish processing plant (the Annette Island Packing Company, which has continued operation until the present day). Profit from the Community-owned enterprises has been used to provide many public services. The Community has also assumed far more responsibilitiy for its members that have other communities across the nation. Hence, a strong sense of mutual committment has evolved within the Community; this committment has undoubtedly been a major factor in the Community's success.

Metlakatla's constitution emphasizes these attitudes in a formal set of rules and regulations prescribing the governance by a twelve-member Community Council and three-member Executive Committee. The constitution also authorizes the Community's government to undertake a more extensive role in Community development and governance than is usually found in communities of its size. For example, Section 3, Article VII, states:

> *The mineral and other natural resources of the Annette Islands and the waters to the distance of 3,000 feet surrounding these islands shall be Community assets. In developing such resources the Council on behalf of the Community as a whole may undertake appropriate industrial and commercial enterprises or authorize, under such regulations as it shall prescribe the organization of associations composed of all or any members of the Community. All profits resulting from the activities of such enterprises of associations shall be deposited in the treasury of the Community.*

Among the enterprises now operated by the Community are the Annette Island Packing Company, the Port of Metlakatla, Metlakatla Power and Light, and the Tamgas Apartment complex. Other activities which produce income for the Community include timber sales, lease of the Annette Hemlock Mill to Louisiana Pacific Corporation, and other land and facilities leases.

FINANCIAL SETTING

While statutes and case law establish an ongoing responsbility of the federal government to further the purpose for which the reservation was set aside, the Community provides a number of services for its members. The Communtiy maintains social services, a senior citizen center, police and fire protection, community work programs, and other municipal services which are not provided by outside agencies. These services are financed, in larg part, by proceeds from Annette Island Packing Company (AIPC) operations.

Table 4 summarizes municipal financial needs and AIPC internal reinvestment requirements for the years 1976 through 1980. Total annual profit needs to meet these objectives (without liquidating other Community assets) averaged about $1,010,000 per year for that five-year period.

Total profit needs for 1981 can be related to raw fish input volume by means of a linear estimating equation based on a recent detailed analysis of the company's operations.* Based upon this equation, it can be estimated that the total company profit needs of $1,010,000 can be met, on the average, by a total raw product input of 1,260,000 salmon.

*Statistical estimation (such as regression analysis) based on historical or time-series data would not be appropriate for this purpose because the company's records are not suitably structured (for example, some of the profits on one season's pack are often not recognized until the sale and receipt of payment in the following year.) Additional information is available from the Annette Natural Resources Center.

Metlakatla Indian Community
Summary of Municipal Financial and AIPC Reinvestment Needs
1976 - 1980

Department Expenditures	1976	1977	1978	1979	1980	1976-1980 Average
General Government	$553,200	$ 334,700	$ 486,100	$717,200	$ 888,900	$ 543,040
Law & Order	132,600	140,400	187,300	246,000	91,900	159,640
Fire Department	93,000	29,600	32,000	43,100	30,000	45,540
Garbage Service	34,200	40,000	31,700	36,000	16,600	31,700
Water Department	12,000	9,700	9,900	19,300	12,900	12,760
Rental Services	19,000	27,400	47,500	49,400	105,600	49,780
Public Health	10,000	12,300	5,700	5,600	12,800	9,280
Other Departments	8,200	18,800	7,900	1,800	700	7,480
Total Expenditures	$597,300	$ 612,900	$ 808,100	$1,118,400	$1,159,400	$ 859,220
Department Revenues						
General Government	-0-	-0-	57,400	-0-	-0-	11,480
Law & Order	106,900	113,900	130,300	184,800	-0- 4/	107,180
Fire Department	12,900	10,500	20,600	21,700	-0- 4/	13,140
Garbage Service	22,900	18,100	15,900	10,200	-0- 4/	13,420
Water Department	2,800	2,900	3,000	2,100	-0- 4/	2,160
Apartment Rentals	17,700	28,600	63,600	99,700	-0- 5/	41,920
Total Direct Revenues	$163,200	$ 174,000	$ 290,800	$ 318,500	-0-	$ 189,300
Other General Revenues 1/	124,000	127,100	190,600	379,200	453,300	254,800
Net Deficit to be financed from AIPCo Profits	($310,100)	($311,800)	($336,700)	($420,700)	($706,100)	($417,100)
AIPCo Internal Reinvestment Requirements 2/	($243,100)	($775,100)	($957,300)	($568,500)	($427,400)	($594,300)
Total AIPCo Profit Needs	($553,200)	($1,086,900)	($1,293,700)	($989,200)	($1,133,500)	($1,011,400)

1/ Includes interest, rental and lease, grant administration and other general revenues. Excludes stumpage receipts and other receipts from liquidation of assets.

2/ Includes improvements to plant and equipment, net increases in skipper's advances, increases in advance to boat loan fund, and long term loan payments.

3/ Estimated

4/ 1980 expenditure data net of grants and service revenues received.

5/ 1980 apartment rental income included in general revenues.

Source: Annette Natural Resources Center.

PART 4

ENVIRONMENTAL CONSEQUENCES

The BIA Juneau Area Director has three basic criteria upon which to base decisions on fishery openings for the Annette Islands Reserve, this section will be organized around those criteria. Issues related to those three criteria will be discussed first, with each criterion cited before each issue discussion. Following the discussion of issues, this section will review the forecast for the 1981 salmon season, and then will analyze the impacts of each alternative schedule of fishery openings as measured by the BIA criteria.

ISSUES

Number of fish required for spawning escapement and any other requirements reasonable and necessary for conservation. **(25CFR 88.3 (e) (1)).**

The conservation issue is of concern to fisheries management personnel, fishermen, and others interested in status of the salmon stocks. Concerns range in breadth from depletion of the entire salmon resource to impacts upon specific runs. As State and private hatchery production increase, hatchery personnel are anxious that hatchery-produced fish return for use as brood stock.

Assuring adequate escapement is necessary for managing the salmon resource on a sustained yield basis. In southern southeast Alaska (Districts 101-108), the Alaska Department of Fish and Game has an escapement goal of 6,000,000 pink salmon (the only species for which consistent escapement data is available). In no year since 1980 (when ADF&G records begin) has the State achieved that goal (see Table 3), although 1980's pink salmon escapement was one of the highest recorded and comes close to the 6 million fish goal. Even-numbered years have averaged 4,277,000 estimated pink salmon escapement, while odd years have averaged 3,436,000 from 1960 through 1980. It appears from this data that an increase in escapement of 40% (from the average escapement in even-numbered years) and 75% (in odd-numbered years) would be needed to achieve the escapement goals. Actually, these figures do not reflect improvements in escapements in recent years; if only the years since 1970 are considered, the even year escapement would have to increase by 36% (of the 4,397,000 pink estimated escapement average), while the odd-year escapement would need to increase by 39% (of the 4,325,000 escapement average).

All catch taken in southern southeast Alaska makes inroads into the total escapement. Annette Island's location at the area's south end places it in a position for early interception of fish migrating in from Dixon Entrance. A review of fish tagging studies by Matthews (1976)

found fish migrating past Annette Island with destinations ranging from Frederick Sound in the north to British Columbia in the south, and from Prince of Wales Island in the west to Behm Canal in the east. It is clear from this migration information that catches at Annette Island are, to some extent, reducing the escapement throughout southern southeast Alaska. The question remains as to how much and where.

The area on which most concern is focused is District 1, the district surrounding Annette Island and the Ketchikan area (see Figure 3). Table 5 and Figure 5 show the statistical relationship between the District 1 escapement and Annette Island trap catch (the most intensive form of fishing on the island in terms of intercepting migrating salmon). The data generally indicate a positive correlation between trap catch and escapement; in years when trap catch is high, escapement is also high. Of course, this analysis does not suggest a cause-and-effect relationship, since a high trap catch does not lead to high escapement. It does suggest that higher trap catches (and therefore higher catches on the west side of Annette Island) *do not* lead to low escapement levels; rather the higher trap catches generally coincide with years of high return, when escapement is high and other southeast catches are also high. The trap fishing effort has not been sufficiently great, and/or the west side of Annette Island is not so strategically located for intercepting runs, to allow the Annette trap fishing to cause an appreciable decline in overall District 1 escapement.

Analysis of salmon tagging data indicates with reasonable certainty, that the Annette Island trap catch (and probably as well, the catch around the islands by seiners and gillnetters) represent relatively small fractions of a good many runs, rather than a substantial fraction of a run to a single area in southern southeast Alaska (Matthews, 1976). Initial analysis of a recent tagging study, conducted by researchers off of Annette Island, reconfirms this finding and also indicates that the majority of fish captured around and adjacent to Annette Island, are Alaska-bound fish, mainly headed for streams in southeast Alaska (Annette Natural Resource Center data, 1980). It is obvious that catches both at Annette Island and in areas outside but adjacent to Annette Island, reduce to some extent, the southeast salmon escapement. The tagging data also indicated that some runs migrating through reserve waters do so only after they have been subjected to other fishing pressure, including purse seining off Prince of Wales Island and gillnetting at Tree Point. However, it is apparent that the impact of Annette Island's fishery is general rather than specific (not affecting specific drainage systems) is therefore hard to define, and is analogous to the impact realized by the fishery in surrounding state waters.

Additional evidence indicating the general nature of the Annette Islands fishery impact related to the timing of the salmon migrations and trap catch past Annette Island. Figure 6 compares the timing of the Annette trap catch and the total District 1 catch. Besides showing that the trap catch is usually quite small compared to the District 1 catch, these graphs suggest that, as a major movement of fish is being fished on the reserve, it is also being fished elsewhere in District 1. Statistical

TABLE 5

SOUTHERN SOUTHEASTERN PINK SALMON ESCAPEMENT
(in thousands of fish)

Year	District 101 Escapement	Total SSE Escapement (District 101-108)
1980	1862	5096
1979	850	4003
1978	2100	5095
1977	2296	5478
1976	1409	4759
1975	1209	4297
1974	1260	3236
1973	752	2879
1972	1653	3945
1971	1200	4970
1970	1709	4248
1969	682	2014
1968	1736	4361
1967	442	1506
1966	1476	5402
1965	544	2944
1964	1536	4745
1963	1106	3915
1962	1225	4235
1961	551	2355
1960	712	1927

1960-1980 Average - even year = 4,277
Average - odd year = 3,436

1970-1980 Average - even year = 4,397
Average - odd year = 4,325

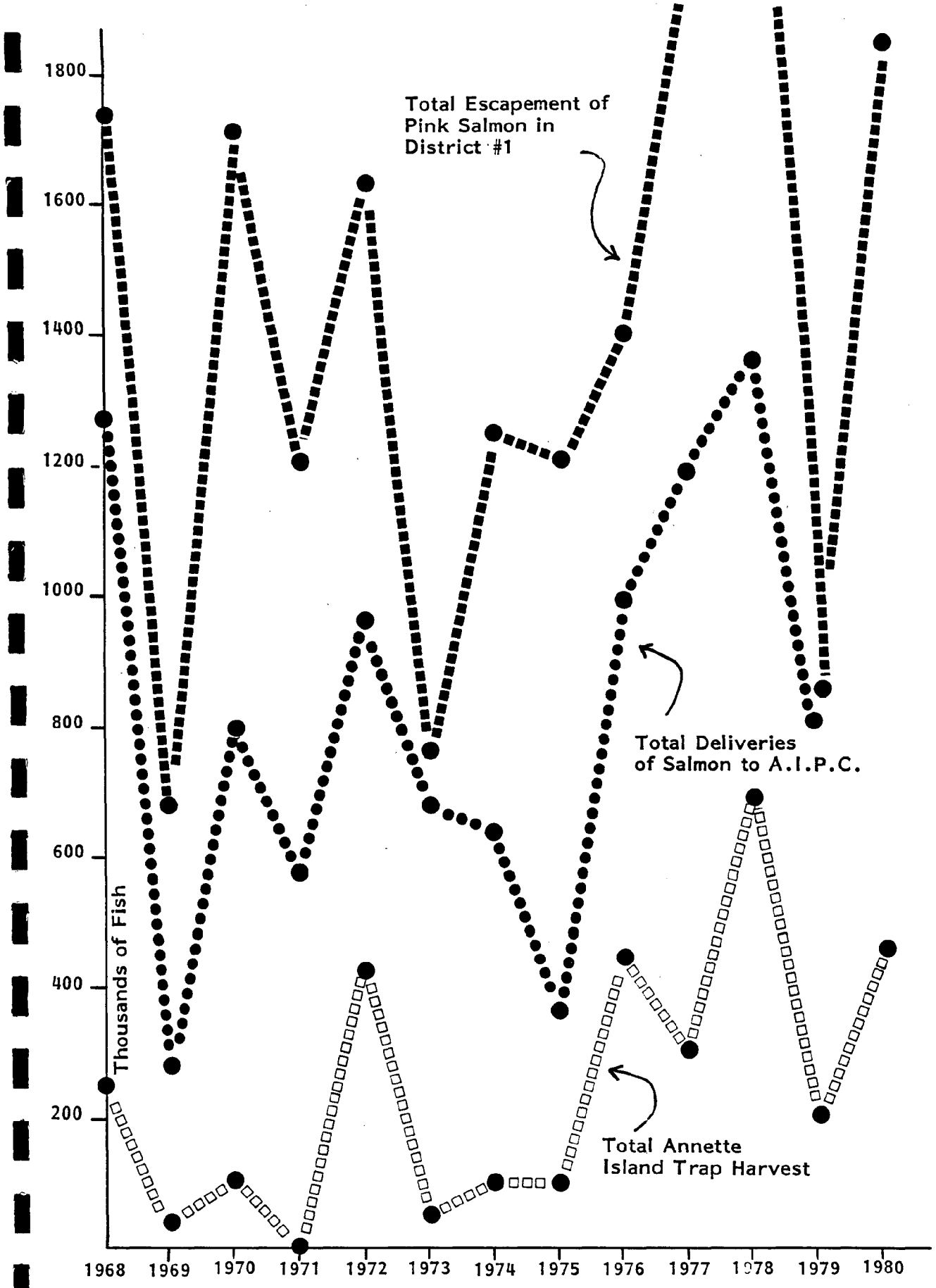
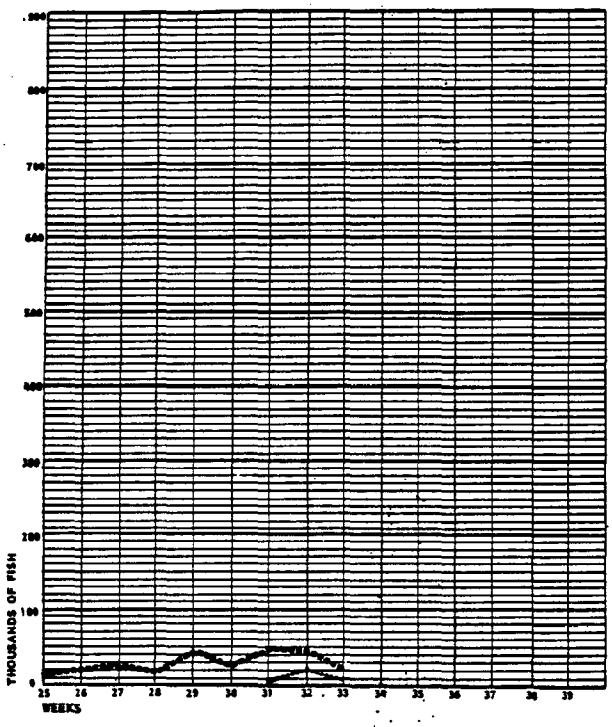
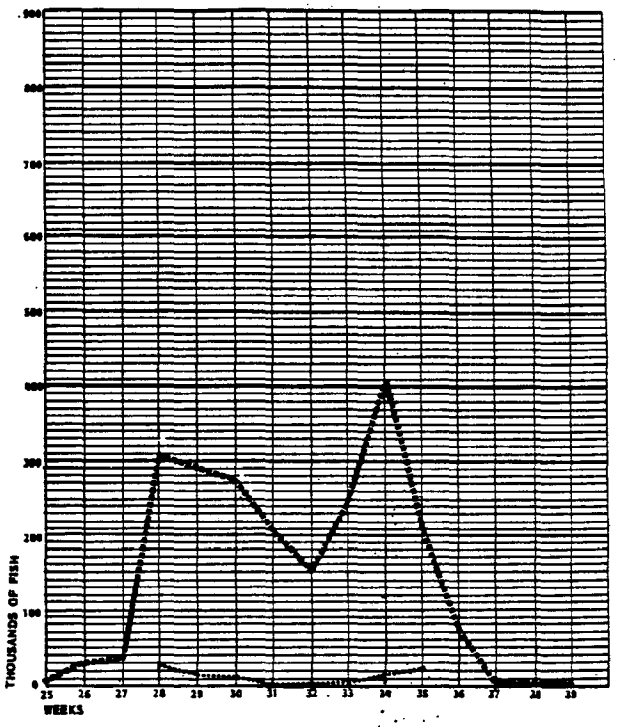


Figure 5. District 1 Pink Salmon Escapement Compared to AIPC Deliveries and Trap Catch.

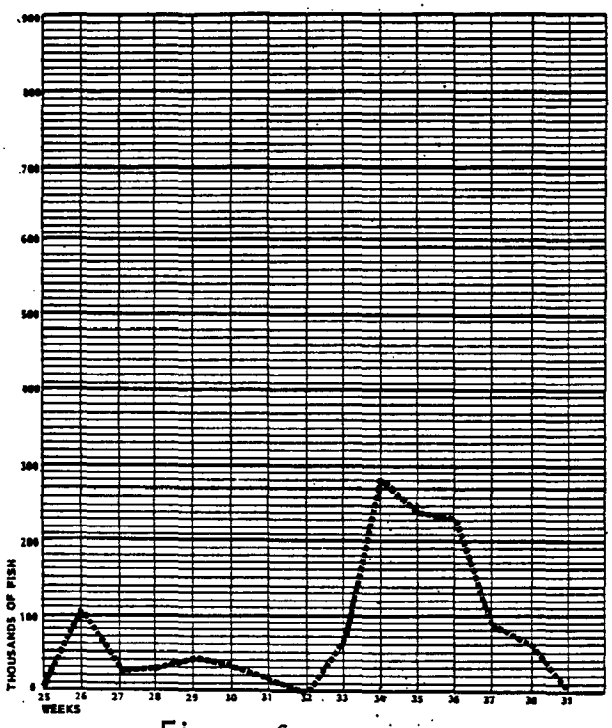


1969



1970

1971 (No trap fishing)



1972

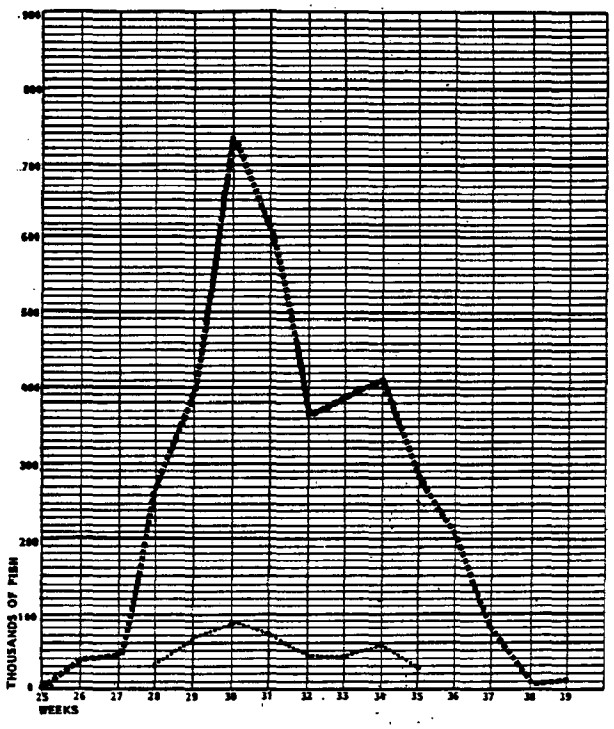
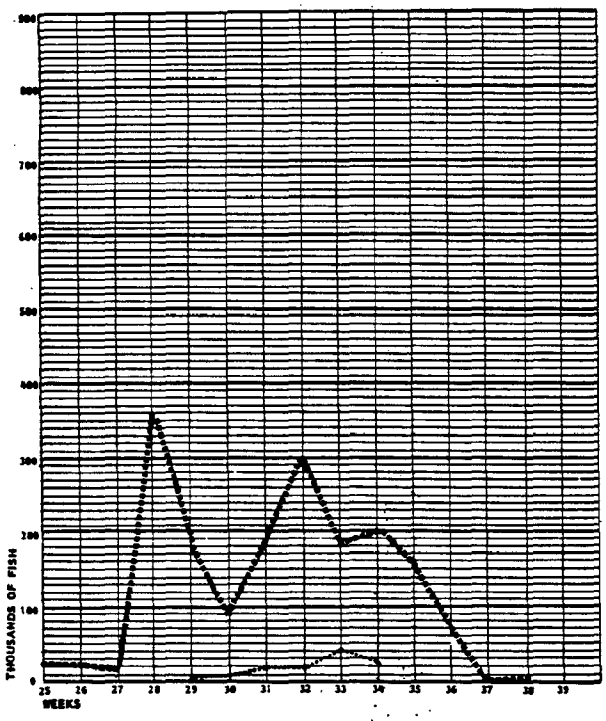


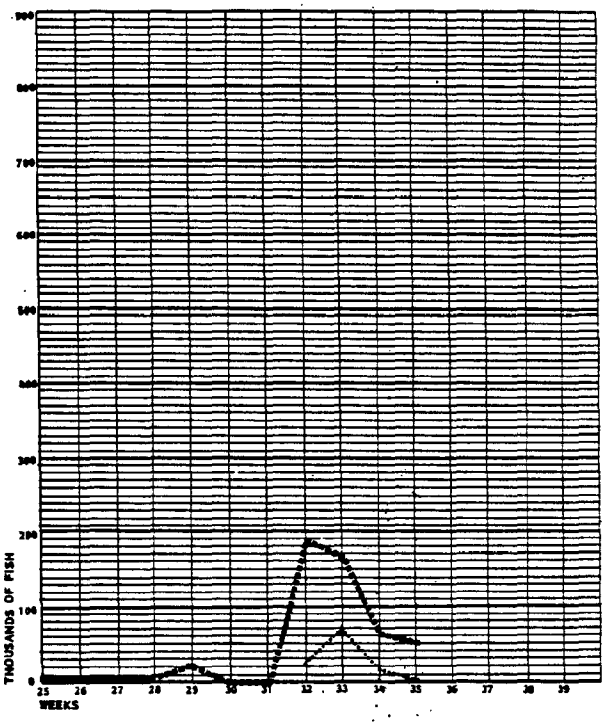
Figure 6
TIMING OF ANNETTE ISLAND TRAP CATCH
AND TOTAL DISTRICT #1 CATCH

Trap Catch

Total District #1 Catch

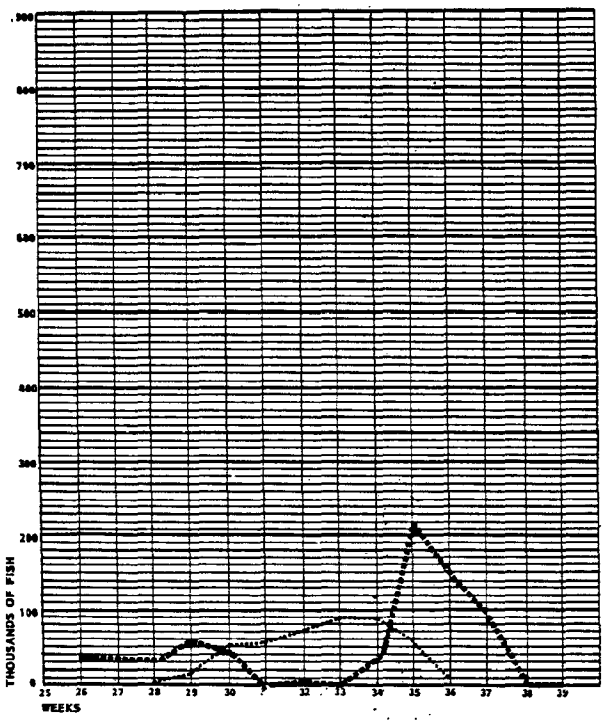


1974



1975

1976



1977

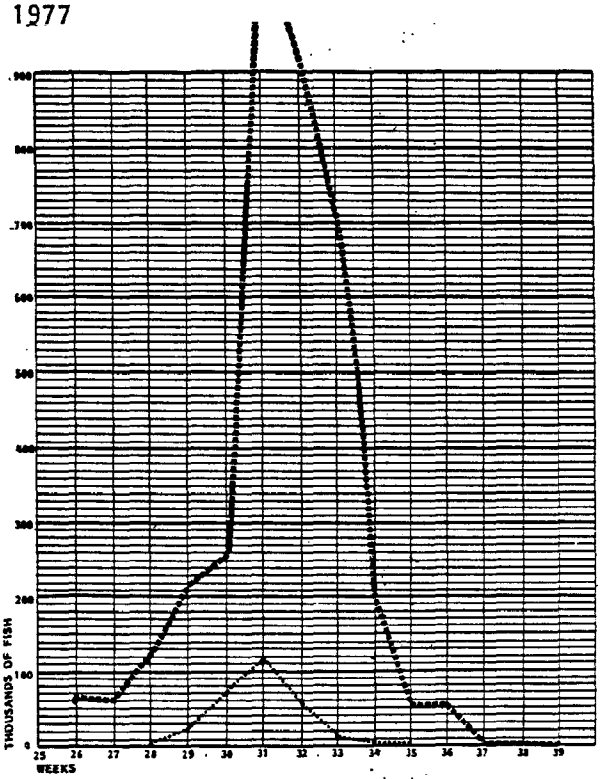
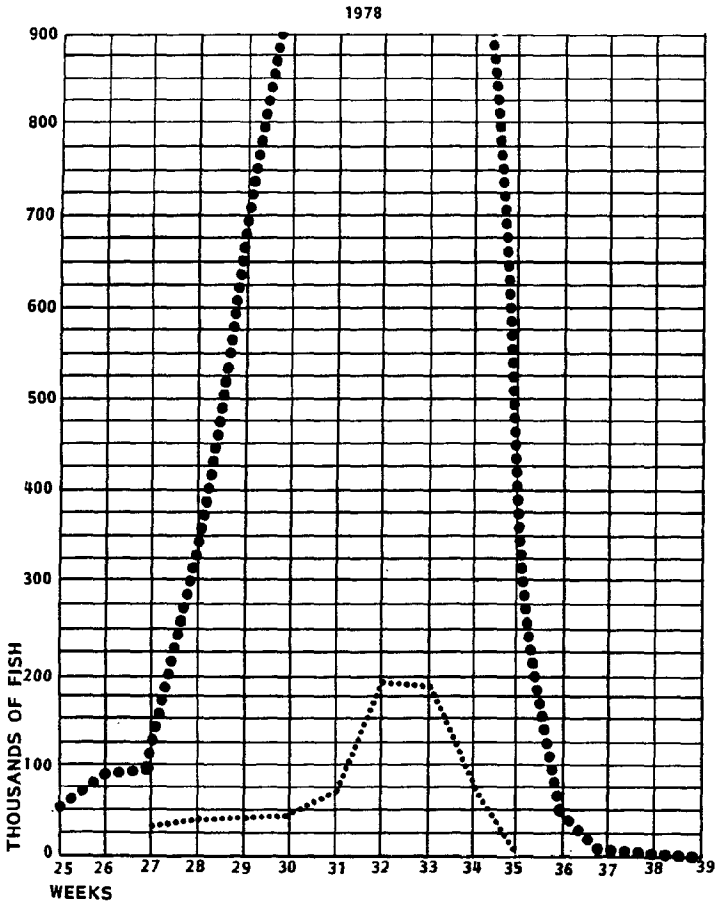
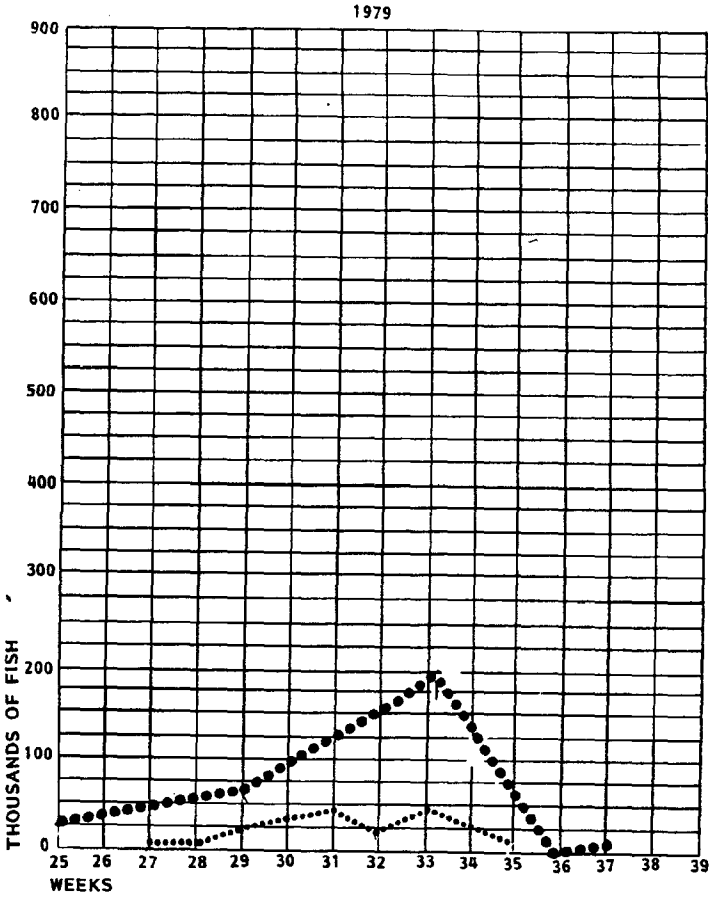


Figure 6 (continued)
TIMING OF ANNETTE ISLAND TRAP CATCH
AND TOTAL DISTRICT #1 CATCH

Trap Catch

Total District #1 Catch





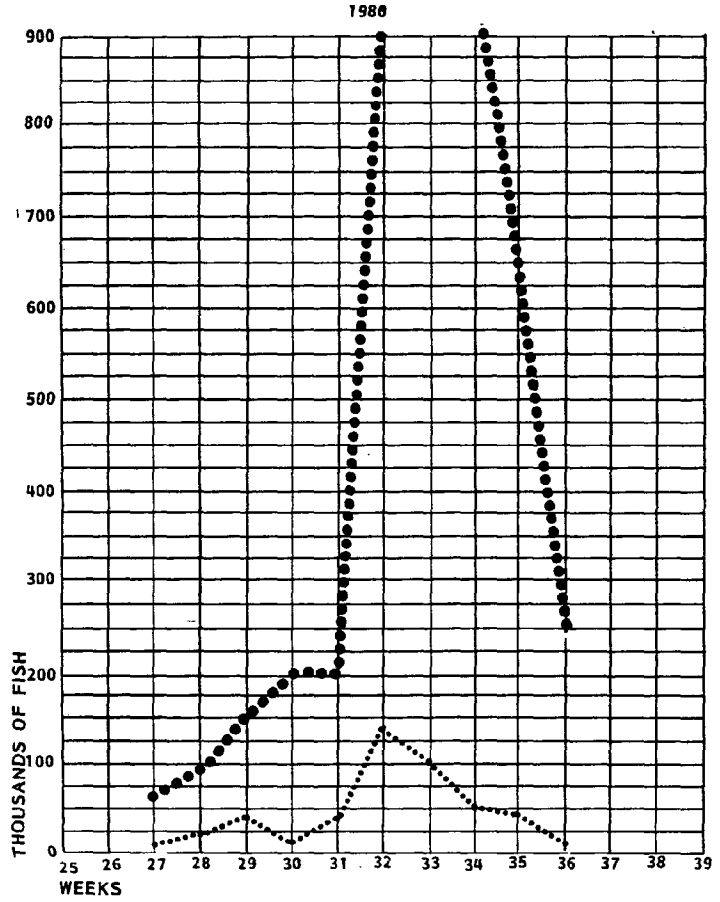


Figure 6 (continued)

TRAP CATCH ••••••••••••

TOTAL DISTRICT #1 CATCH ●●●●●●●●●

analysis of the timing data shows strong positive correlations between Annette Island trap catch and District 1 total catch in 1972, 1973, 1975, and 1980. There were weak but positive correlations in the years 1969, 1970, 1974, 1976, and 1977.

In summary, the available data do not indicate that fishing practices on the reserve have had a significant impact on total escapement in southeast Alaska.

The data are not sufficient to ascertain any effect on specific runs. In light of ADF&G policies aimed at escapement, varying catch levels on the reserve from year to year appear to reflect allocation of the resource to Annette Islands' fishery, more than they do an impact of the fishery on the resource as a whole or on any specific run of salmon. Further, the resource management efforts of the Metlakatla Indian Community are aimed at producing a net surplus of salmon, over and above the Community's harvest, from the hatchery and the many natural runs originating on Annette Island streams. (Further details on this management program are outlined in the section, Mitigating Measures.)

Fair and equitable sharing of the resource with other user groups fishing in State waters under State law and within the State fisheries managment system (25 CFR 88.3 (e) (2)).

The question of equitablity is one which is subject to different interpretations by different user groups. Data on historical shere of the catch provides some insight into equitablity under previous BIA management. Harvest data for the period 1968 through 1980 show the local share (as deliveries to AIPC) ranging from a low of 7.3 percent, to a high of 15.9 percent, and averaging 10.4 percent of total southeast Alaska deliveries (Table 6). If the "sharing" issue is interpreted as the catch accruing to the Community as a whole, the trap catch can be interpreted as the Community share, since the traps are owned by the AIPC, which is Community-owned. In the perioed 1968 to 1980, the trap catch averaged two percent of the total southeast Alaska harvest, ranging from a low of zero in 1971 (when the traps did not fish) to a high of 5.6 percent in 1976.

Another consideration is the number of packing companies in the area. Excluding the icing and fish-buying stations on the outside of Prince of Wales Island, there are only three or four fish packing companies remaining in southern southeast Alaska. Given these curcumstances an equal "share" would be 25 to 33 percent of the southern southeast harvest. In the last twelve years, however, the AIPC share averaged less than 11 percent of the southern southeast harvest.

The Federal purpose in the establishment and maintenance of the Metlakatla Indian reservation (25 CFR 88.3 (e) (3)).

The Federal government's responsibilities to Metlakatla are based on a series of specific agreements between the Metlakatla Indian Community and

TABLE 6

ANNETTE ISLAND PACKING COMPANY PRODUCTION COMPARED TO
SOUTHEAST AND SOUTHERN SOUTHEAST ALASKAN COMMERCIAL SALMON HARVEST

1968-1980

YEAR	COMMERCIAL SALMON HARVEST Southeast (X 1,000)	Southern Southeast	AIPC Gross Inputs (Raw Fish) (X 1,000)	DELIVERIES TO AIPC AS A SHARE OF: Southeast catch (Percent)	Southern Southeast catch
1968	30,400	15,096	1,281.9	4.2	8.5
1969	7,200	1,731	283.7	3.9	16.4
1970	14,800	6,633	801.9	5.4	12.1
1971	13,200	7,745	567.3	4.3	7.3
1972	18,000	11,607	978.8	5.4	8.4
1973	10,500	6,229	680.1	6.5	10.9
1974	8,900	6,063	632.2	7.1	10.4
1975	5,700	4,172	361.5	6.3	8.7
1976	8,000	6,349	1,006.7	12.6	15.9
1977	16,500	12,704	1,204.0	7.3	9.5
1978	23,300	18,462	1,554.2	6.7	8.4
1979	13,600	7,900	817.8	6.0	10.6
1980	18,710	14,621	1,714.6	6.6	8.2
Average all years	14,524	9,177	914.0	6.3	10.4
Average odd years	11,117	6,747	652.0	5.7	10.6
Average even years	17,444	11,260	1,139.0	6.9	10.3

the Federal government and have been further defined through a series of Federal statutes, regulations, and judicial decisions. The nature of federal responsibilities are unlike those toward other Alaskan natives. Under the terms of this relationship, the U.S. government, through the BIA, holds land and/or funds of the community government in trust, assuming the legal responsibility to manage those lands and funds in the best interests and welfare of the beneficiaries.

The welfare goal has been translated by the Community into two specific objectives: (1) obtaining sufficient revenues from AIPC operations to satisfy revenue needs, to provide municipal services to Community members, and (2) provide adequate income to Community fishermen and processing workers. The latter objective, employment, is generally satisfied when Community fishing opportunity provides sufficient volumes of fish to allow breakeven or profitable operation of the processing plant. Hence, the Community welfare objectives can be summarized in terms of the remaining objective, that of allowing operation of the plant at volumes sufficient to fund municipal operating needs and plant internal investment requirements.

The Community's needs are likely to increase this year. Due to the unstable Japanese lumber market and therefore the mill (Louisiana Pacific, of Annette) shut-downs predicted for this summer, unemployment of Community members can only be resolved by increased cannery employment. The cannery is present to employ Community members and to help the Community become self-sustaining. Only a stable or increased cannery income can alleviate the unemployment problem predicted for the summer.

The estimated amount required for the Community fund from 1981 AIPC profits is $1,011,400, which would require a raw product input of at least 1,257,000 salmon.

FORECAST FOR 1981 SALMON SEASON

As shown in the data in previous sections, the salmon returns vary greatly from year to year. Any projections of the environmental consequences of alternative management schemes for 1981 must be based on the probable returns for this year, since catch, catch per unit effort, escapement, and number of fishing days allowed will be related to the 1981 return levels. This section summarizes forecasts by the Alaska Department of Fish and Game for 1981 (Information leaflet No. 190, ADF&G).

The 1980 statewide catch of approximately 110 million fish (all species) represented the sixth consecutive year that the salmon harvest has increased. The 1981 pink salmon return is expected to be relatively strong in both southern and northern southeast. The southern southeastern return point estimate for 1981 is 14.6 million pink salmon with a range of 11.3 to 18.6 million. The escapement goal of 6.0 million leaves a harvest point estimate of 8.6 million, with a range of 5.3 million to 12.6 million. Historically, the southern southeast catch took approximately half of all species besides pinks. Using this share, the southern southeast point

harvest estimate, including all species, is 10.1 million, with a range of 6.8 to 14.1 million fish. The northern southeastern return point estimate of 6.8 million pink salmon, with a range of 3.8 to 11.9 million. The escapement goal of 4.8 million leaves a harvest point estimate of 2.0 million, with a range of 500,000 to 7.1 million. Therefore, for all of southeastern, the harvest point estimate is 10.6 million pink salmon, with a range of 5.8 million to 19.7 million. In addition to the pink salmon catch, it was projected that the southeastern Alaska harvest estimates would be 300,000 kings, 800,000 sockeye, 1,000,000 coho, and 900,000 chum (ADF&G, 1981). The total predicted salmon harvest for southeastern is 13.6 million fish. This is 73 percent of last year's total salmon catch for southeast. The level of fishing effort allowed is expected to be moderately strong, according to ADF&G.

In addition to the preceeding 1981 ADF&G forecast, a letter was sent to the BIA Juneau Area Director from Ronald Skoog, ADF&G Commissioner concerning the District 1 and 2 pink salmon run. Due to poor escapement in 1979, the projected pink return for District 1 is expected to be weak, at a level of three million; with an escapement goal of two million, only about one million pinks will be available for harvest. (It should be noted here that ADF&G modified its usual forecasting method to develop this estimate. Their regular method would give an estimated harvestable surplus of three million of District 1.) ADF&G anticipates no purse seine opening until the last week of July or early August. Additionally, the district 4 outside fishery will be managed to minimize the interception of early run pinks and restrictions are anticipated in the District 1 drift gillnet fishery (although, that fishery is expected to open on time, on the second Sunday of June). The late and restricted openings have an effect on the openings proposed by the Metlakatla Indian Community for traps and island gillnetting and seining, as evidenced by the proposed fishery openings for 1981.

IMPACTS

The consequences of alternative reserve fishery management schemes can be measured in terms of the same three criteria referred to by 25 CFR 88.3(c): escapement requirements, fair and equitable sharing with other user groups and Federal fiduciary duties to assure Community well-being. This section presents a discussion of the three alternative management schemes described in Section 2, in terms of these criteria to provide a basis for evaluating the relative merits of each alternative.

Quantitative estimates of the likely outcome of the 1981 season were prepared using a detailed fishing effort and catch-predicting model. Detailed explanations of the model's workings and underlying concepts are described in the Appendix; important features are described briefly below.

Catch levels were forecast for each alternative by gear type and fishery area based upon three major assumptions:

(1) Openings in State waters conform to the statistical relationship between actual openings and total run size between 1975 and 1980.

Alternative fishery opening schemes are as outlined in Section 2. State and reserve fisheries are assumed to overlap. Thus, if the reserve is open for four days and State waters are open for three days in a week, Community fishermen with State permits would be able to fish four days, not seven.

(2) Area catches are distributed among gear types and user groups based upon the historic relationship between catch levels in southern Southeast Alaska and available measures of catch per unit effort, modified by policies of the State and the Community in allocating fishery openings. For purposes of this analysis, catch rates are assumed to be constant for all levels of gear concentration.

(3) Community fishermen with limited entry permits were assumed to fish in southern southeast watesr outside of the reserve during State openings, during half the time of State openings, even though reserve waters might be open, to avoid the potential of diminished catch rates due to concentration of Community gear around the island. These same fishermen would fish reserve waters when State waters were closed. Community fishermen without limited entry permits were assumed to fish reserve waters.

Data Limitations

Owing to limitations in both the data and time available to complete the analysis, the figures must be reviewed with caution. The analysis implicitly included known possible sources of error in a manner which probably overestimated the actual harvest.

Five possible sources of bias or error in the analysis can be readily identified. Three have the effect of increasing the catch estimates, one leads to underestimation and the direction of the fifth is unknown.

The first area of possible bias in the analysis is that all Metlakatla boats are assumed to fish continuously during every opening. Clearly, this may overestimate the Community's fishing effort, since gear breakdown, weather and distance between openings will tend to reduce the percentage of available time which the Community's fleet actually fishes. Since the magnitude of this overestimate of catch is unknown, no adjustments are made to account for this.

A second source of possible bias is that the amount of catch which Community fishermen with limited entry permits deliver to other processors while fishing in State waters is not subtracted for AIPC inputs. (Conversely, deliveries by non-Community fishermen to the Annette Island Packing Company are included in the AIPC production estimates). This introduces an upward bias into the estimate of deliveries to the Annette Island Packing Company, and consequently also leads to an overestimate of AIPC profits available for distribution to the Community.

Third, the power and hand troll catch delivered to the AIPC is not included in Community harvest of AIPC production estimates. The magnitude of error in the Community catch estimate is probably insignifcant, due to the small size of the local trolling fleet, and to its almost exclusive use of hand gurdies. Non-Community troll deliveries are more substantial, probably ranging around 30,000 to 50,000 salmon per year.

A fourth area of possible bias relates to the estimate of opening days in State waters. The analysis utilizes an estimate based on the statistical relationship between past openings and total salmon returns; however, other variables influence the State's decisions regarding openings, so the estimate may err by an unknown direction and magnitude.

The final source of bias probably introduces a significant over-estimation of Community catch, but data limitations make it impossible to accurately adjust estimates at this time. The estimates utilize historic catch per unit effort figures for southern southeast Alaska, controlled for the level of salmon returns in each year, to predict catch rates by gear type (purse seine, gillnet and trap). This results in a single point estimate for each gear type which takes no account of the differences in productivity among fishing grounds, or of the effects of gear concentration, in predicting catch per vessel per day. Moreoever, it is quite likely that assumed concentrations of Community gear in reserve waters would lower reserve catch rates below the regional average. (In the first 1980 gillnet opening, for instance, Community gillnetters averaged 390 pounds per vessel; other gillnetters averaged nearly 1000 pounds.) This is particularly true of days in which only reserve waters would be open to Community fishermen. Although the magnitude of the error is unknown, it is likely to be significant, and thus it overestimates the Community catch.

Summary of Impacts

Table 7 summarizes the projected impacts of each alternative on the three federal criteria--escapement, sharing, and federal purpose--for managing the Annette Islands Reserve fishery. Although it is not possible to quantitatively determine which alternative best meets all

TABLE 7

ANNETTE ISLANDS RESERVE 1981 SALMON MANAGEMENT PLAN

SUMMARY OF EXPECTED IMPACTS

	Community Proposal Alternative I	State Openings Alternative II	Community Needs Alternative III
Community Catch (1000 fish)			
AIR waters "	852.5	567.1	802.7
State waters "	299.2	299.2	299.2
Total MIC catch "	1,157.7	866.3	1,101.9
Impact On:			
Escapement (AIR catch as % of District 1 catch)	64.2%	42.7%	60.4%
Sharing (AIPC pack as % of SSE catch)	11.7%	8.5%	10.9%
Federal purpose (AIPC profit as % of base requirement $869,000)	108.5%	63.3%	100.0%

Key:
MIC Metlakatla Indian Community
AIR Annette Islands Reserve
SSE Southern Southeast Alaska
AIPC Annette Island Packing Company

Note: The percents shown for AIR catch as % of District 1 catch are arbitrary numbers to prove conservation concerns. Historic data (78-79) show community harvest equaling 18.3% of District 1 harvest and 11.3% of combined Districts 1 and 2 harvest. Thus the % shown are the most severe possible escapement impacts and are very unlikely to occur.

As noted elsewhere, permitted Community vessels can fish in either State waters or reserve waters when both areas are open. As a result, fishing periods for the permitted fleet will fall within a broad range. The Community's purse seine fleet, for example, will be able to fish up to 16 days in the reserve fishery, and and additional 9 days in State areas outside of Districts 1 and 2 (e.g., Prince of Wales, Cordova Bay, etc.). Alternatively, the seine fleet may choose to fish all 25 days in State waters only. The Community's permitted gillnetters, meanwhile, can (under Alternative 1) fish all projected 52 days within the reserve; at the other extreme, the fleet may choose to fish up to a projected 40 days in State areas and an additional 12 days within the reserve.

For purposes of this analysis, a set of three estimates has been evaluated for each alternative:1)a "high impact" estimate in which permitted Community vessels are assumed to fish exclusively in the reserve when fishing periods coincide; (2) a "low impact" estimate in which the fleet will fish in State waters; and (3) a "point estimate" (used to calculate total catch estimates presented in this section which assumes that fishing effort will be spread evenly by permitted vessels between State and reserve waters when fishing periods coincide. This latter estimate is consistent with aerial observations of fishing activity around Annette Island during the 1980 season. (Annette Natural Resource Center data, 1980).

all three criteria simultaneously, the figures do enable the reader to compare relative tradeoffs (i.e., how much of one criterion must be given up to gain a certain amount of another.

In terms of the escapement criterion, Alternative 1 (Community Proposal) represents the largest Community catch, and therefore the largest percentage of the District 1 harvest. Alternative 3 (Community Needs) is the second largest, while Alternative 2 (State Proposal) is the least. Notably, no alternative results in the Community's fleet harvesting more than 64 percent of total District 1 catch. Hence, no alternative by itself appears to harm District 1 total escapement goals. Again, it should be noted that, (with the exception of terminal fisheries), any commercial fishery which attempts to take the total number of salmon surplus to escapement needs will inevitably overharvest some stocks, while underharvesting others. The diversity of stocks fished by the Community fleet and the large gap between Reserve catch and total allowable District 1 catch, however, allows the State latitude to adjust its management approach and still meet its escapement goals in most, if not all, southern southeast Alaska fisheries.

In terms of the sharing criterion, the alternatives range from the Community catching from as low as 8.5 to as high as 11.7 percent of the southern southeast harvest. Alternative 1 would have the largest share, followed in decreasing order by Alternatives 3 and 2. The estimate for Alternative 1 is higher than the Community's historical share of 10.6 percent (Table 4) of southern southeast catch, while Alternative 3 is about the same and Alternative 2 is lower.

The final criterion (federal purpose) is represented as the percent of AIPC profit requirements which would be achieved under each alternative. Only Alternative 1 (Community Proposal) and 3 (Community Needs) appear to achieve this criterion under most foreseeable circumstances. Alternative 2 achieves slightly less than two-thirds of this objective.

The following sections describe the estimates for each alterantive more fully. Appendix I presents data and methods used to complete the impact analysis.

Impacts of Alternative I (Community Proposal)

Implementation of the Community Proposal (Alternative I) would result in a total season of 25 fishing days for the Community's purse seine fleet, 52 fishing days for Community gillnetters, and 32 trap fishing days (Table 6). Catch within reserve waters would total 852,000 salmon during the 1981 season. An additional 299,000 salmon would be caught in State waters by Community boats holding limited entry permits, for total Community fleet landings of 1,151,700 salmon. If all Community vessels delivered their catch to AIPC, and sales of fish to AIPC by non-Community purse seine and gillnet fishermen occurred as expected, production would

total 1,310,600 salmon.* Projected profits from AIPC operations would total $1,097,000. Catch by all Community gear would total 11 percent of the southern southeast harvest. Landings within the reserve fishery would account for 64 percent of the total harvest projected for District 1 (presuming escapement goals are met). (Table 9.)**

TABLE 8

Alternative I - Community Proposal
Aggregate Number of Fishing Days and Vessels
by Gear Type, by Fishery
1981 Projection

Fishery/ Fleet/ Gear Type	No. Vessels	No. Days
AIR Fishery--Community Fleet		
Purse Seine	12	0-16
Gillnet w/ Permit	9	12-52
Gillnet w/o Permit	24	52
Traps	4	32
State Fishery--Community Fleet		
Purse Seine	12	9-25
Gillnet w/ Permit	9	0-40
State Fishery--Non-Community Fleet**		
Purse Seine	4	25
Gillnet	4	40

*Non-Community Fleet" refers to nonreservation vessels which delivery to the Annette Island Packing Company.

**See Footnote to Table 7.

Impacts of Alternative 2

Implementation of Alternative 2 would result in a total season of 25 days for Community purse seiners, 40 days for the Community gillnet fleet, and 16 days for Community-operated traps. (Table 10). Reserve catches would total 567,100 salmon. An additional 299,200 fish would be taken by permitted Community vessels in State waters, for a total Community fleet catch of 866,300, or 8.5 percent of the southern southeast catch. If deliveries by non-Community purse seiners and gillnetters are included,

TABLE 9

Alternative I - Community Proposal
Total Catch By Gear Type, By Fishery
1981 Projection

Fishery/ Fleet/ Gear Type	Projected Catch (1000 fish)
(1) AIR Fishery--Community Fleet	
Purse Seine	155.2
Gillnet w/ Permit	48.9
Gillnet w/o Permit	212.2
Trap	436.2
Subtotal	852.5
(2) State Fishery--Community Fleet	
Purse Seine	268.6
Gillnet w/ Permit	30.6
Subtotal	299.2
(3) All Fisheries--Community Fleet (1+2)	
Purse Seine	423.8
Gillnet	291.8
Trap	436.2
Total	1,151.8
(4) State Fishery--Non-Community Fleet*	
Purse Seine	131.7
Gillnet	27.2
Subtotal	158.9
(5) Total AIPC Production (3+4)	1,310.7
(6) AIR Fishery Harvest (1) as a % of Total District 1 Catch (=1.328 million fish)	64.2%
(7) Total Community Harvest (3) as a % of Total SSE Catch (=10.1 million fish)	11.4%
(8) Projected AIPC Profit ($1000)	1,097.0

*"Non-Community Fleet" refers to non-reservation vessels which deliver to the Annette Island Packing Company.

*

It should be emphasized here that the estimates quoted above are based on the assumption that half the Community's permitted fleet will fish in State waters when State and reserve fishing periods coincide. If this assumption is relaxed--specifically, if it is assumed that the entire Community fleet will fish within Reserve waters whenever they are open--then the greatest possible impacts under Alternative 1 are:

AIR Harvest as % of District 1 harvest: 78.2%

Total Community harvest as % of SSE : 11.7%

Projected AIPC profit: $1,143,800

deliveries to AIPC would total 1,025,200 salmon, resulting in total AIPC profits of $640,300, or about half of profit requirements. Landings within the reserve fishery (567,100 fish) would amount to roughly 43 percent of the total District 1 catch (presuming State escapement goals are met). (Table 11 .)

TABLE 10

Alternative 2 - Projected State Openings
Aggregate Number of Fishing Days and Vessels
By Gear Type, by Fishery
1981 Projection

Fishery / Fleet / Gear Type	No. Vessels	No. Days
AIR Fishery--Community Fleet		
Purse Seine	12	0-16
Gillnet w/ Permit	9	0-40
Gillnet w/o Permit	24	40
Traps	4	16
State Fishery--Community Fleet		
Purse Seine	12	9-25
Gillnet w/ Permit	9	0-40
State Fishery--Non-Community Fleet*		
Purse Seine	4	25
Gillnet	4	40

*"Non-Community Fleet" refers to non-reservation vessels which delivery to the Annette Island Packing Company.

Impacts of Alternative 3 (Community Needs)

If the third alternative is implemented, Community purse-seiners would fish 25 days, while Community gillnetters would fish 48 days. The Community traps would operate 30 days. By contrast, non-Community purse seiners and gillnetters would fish 25 and 30 days, respectively (Table 10).

On-reserve catch by the Community fleet would total 802,700 salmon; when catch from State waters is included, the catch by the Community's fleet would total 1,101,900 salmon. Adding deliveries by non-Community fishermen, AIPC production would total 1,260,800 salmon, resulting in a

TABLE 11

Alternative 2 - Projected State Openings
Total Catch By Gear Type, By Fishery
1981 Projection

Fishery / Fleet / Gear Type	Projected Catch (1000 fish)
(1) AIR Fishery-Community Fleet	
Purse Seine	155.2
Gillnet w/ Permit	30.6
Gillnet w/o Permit	163.2
Tap	218.1
Subtotal	567.1
(2) State Fishery--Community Fleet	
Purse Seine	268.6
Gillnet w/ Permit	30.6
Subtotal	299.2
(3) All Fisheries--Community Fleet (1+2)	
Purse Seine	423.8
Gillnet	224.4
Trap	218.1
Total	866.3
(4) State Fishery--Non-Community Fleet*	
Purse Seine	131.7
Gillnet	27.2
Subtotal	158.9
(5) Total AIPC Production (3+4)	1,025.2
(6) AIR Fishery Harvest (1) as a % of Total District 1 Catch (=1.328 million fish)	42.7%
(7) Total Communit Harvest (3) as a % of Total SSE Catch (=10.1 million fish)	8.6%
(8) Projected AIPC Profit ($1000's)	$640.3

*"Non-Community Fleet" refers to non-reservation vessels which delivery to the Annette Island Packing Company.

It should be emphasized that the estimates quoted here are based on the assumption that half the Community's permitted fleet will fish in State waters when State and Reserve fishing periods coincide. If this assumption is relaxed--specifically, if it is assumed that the entire Community fleet will fish within reserve waters whenever they are open--then the greatest possible impacts under Alternative 2 are:

AIR harvest as % of District 1 harvest: 56.7%

Total Community harvest as % of SSE: 8.9%

Projected AIPC profit: $686,500

profit totalling $1,017,300, satisfying profit objectives.* Harvest by the Community fleet would thus amount to 10.9 percent of the total southern southeast catch. Landings within the reserve would account for 60 percent of the total harvest projected for District 1.** (Table 11.)

TABLE 12

Alternative III - Community Needs
Aggregate Number of Fishing Days and Vessels
By Gear Type, by Fishery
1981 Projection

Fishery/ Fleet/ Gear Type	No. Vessels	No. Days**
AIR Fishery--Community Fleet		
Purse Seine	12	0-16
Gillnet w/ Permit	9	8-48
Gillnet w/o Permit	24	8
Traps	4	30
State Fishery--Community Fleet		
Purse Seine	12	9-25
Gillnet w/ Permit	9	0-40
State Fishery--Non-Community Fleet*		
Purse Seine	4	25
Gillnet	4	40

*"Non-Community Fleet" refers to non-reservation vessels which delivery to the Annette Island Packing Company.

**See footnote to Table 7.

IMPACT ON ANNETTE ISLAND SALMON RUNS

There has been some concern expressed in Metlakatla about the effect of the salmon fishery management schemes on fish runs originating on Annette Island. At least 38 streams on the island produce salmon in varying numbers, but a scarcity of tagging data makes it impossible to project the effects of the alternatives on the local streams. Specifically, it is not apparent

how many local fish are caught in the reserve, and how many are caught in other areas. In fact, it is only since the beginning of the Annette hatchery program (1977) that regular escapement records have been collected from Annette Island streams.

There is some evidence, however, that many local runs return late in the season, after the regular fishing season closes. While this observation may not apply to all Annette Island runs (particularly the Tamgas Lake and Tain Lake sockeyes), it does suggest that there would not be a significant difference in the impact of the four alternatives on local runs. It is possible that these fish receive their fishing in the seine fishery in District 104 (Noyes Island).

TABLE 13

Alternative 3 - Community Needs
Total Catch By Gear Type, by Fishery
1981 Projections

Fishery/ Fleet/ Gear Type	Projected Catch (1000 fish)
(1) AIR Fishery--Community Fleet	
Purse Seine	155.2
Gillnet w/ Permit	42.8
Gillnet w/o Permit	195.8
Trap	408.9
Subtotal	802.7
(2) State Fishery--Communinty Fleet	
Purse Seine	268.6
Gillnet w/ Permit	30.6
Subtotal	299.2
(3) All Fisheries--Community Fleet (1+2)	
Purse Seine	423.8
Gillnet	269.2
Trap	408.9
Total	1,101.9
(4) State Fishery--Non-Community Fleet**	
Purse Seine	131.7
Gillnet	27.2
Subtotal	158.9
(5) Total AIPC Production (3+4)	1,260.8
(6) AIR Fishery Harvest (1) as a % of Total District 1 Catch (=1.328 million fish)	60.4%
(7) Total Community Harvest (3) as a % of Total SSE Catch (10.1 million fish)	10.9%
(8) Projected AIPC Profit ($1000's)	1,017.3

**"Non-Community Fleet" refers to non-reservation vessels which delivery to the Annette Island Packing Company.

It should be emphasized that the estimates quoted here are based on the assumption that half the Community's permitted fleet will fish in State waters when State and reserve fishing periods coincide. If this assumption is relaxed--specifically if it is assumed taht the entire Community fleet will fish within reserve waters whenever they are open--then the greatest possible impacts of Alternative 3 are:

AIR harvest as % of District 1 harvest: 74.4%

Total Community harvest as % of SSE: 11.1%

Projected AIPC profit: $1,063,500

PART 5

MITIGATION MEASURES

The impacts of the fishing described in the previous section can be mitigated by two major programs that the Community is currently undertaking. The first is the Tamgas Creek Hatchery, producing fish that should (by 1982) provide the Community with a net surplus of returning salmon. The second major program is the Annette Island fisheries management program, which includes several salmon management research projects. In addition, the BIA can use fishery closures as a mitigation measure.

Tamgas Creek Hatchery and Related Developments

The Metlakatla Indian Community has been engaged in fisheries resourve enhancement since 1976, with the constrction of a small temporary hatchery in an abandoned Coast Guard structure (called the Annette Island Fish Hatchery). Since that time, the new Tamgas Creek Hatchery was put into operation and currently houses pink, chum, and coho salmon. In 1980, 47,000 coho smolt, 107,000 pink fry, and 557,000 chum fry were released from Tamgas Creek. In 1981, 300,000 coho smolt, 1,950,000 pink fry, and 613,000 chum fry will be released. In addition, there are 407,000 coho fry on hand that will be released in 1982 (Source: Annual Report - Hatchery Management for 1980, Annette Natural Resource Center). The predicted returns from these releases will be included in the Annette Island salmon production estimates and Salmon Management Plans in future years. For 1981, the expected return (to Tamgas Creek Hatchery) from hatchery releases in previous years is 6,000 pinks, 800 chum, and 2,000 coho. These will probably all be used for brood stock, and the first year for an expected surplus harvest is 1982. At full capacity (60 million eggs, with a distribution of 25 million pinks, 20 million chum, 10 million coho, and 4 million sockeye) returns could exceed 1,200,000 fish, even with conservative estimates. Therefore, hatchery returns could exceed the total Annette Island catch (1,194,000 fish in 1980, all species).

Additional hatchery programs include Metlakatla's involvement in the coded wire tagging program, as well as other tagging programs. Over 30 tagged fish were recovered from fish brought into the Annette Island Packing Company. The data was collected and turned in to ADF&G. In addition, coho and chum salmon released from the Tamgas Creek Hatchery will be tagged with coded wire head tags, and 15,000 pinks are currently being fin-clipped for identification (both the dorsal and adipose fins will be cut).

Finally, the hatchery has adopted fish disease and fish nutrition control guidelines, as a part of the Tamgas Creek Hatchery Operational Manual. These guidelines include criteria accepted by on-going hatchery programs

in other states, Canadian provinces, as well as by the U.S. Fish and Wildlife Service. They represent a part of the effort put forth by the Community to adhere to standard hatchery practice and to make the Tamgas Creek Hatchery a success.

Fisheries Management Program

In the last five years the Metlakatla Indian Community has been assuming increased responsibility for management of its fisheries resources. Using both Community employees and consultants, the Annette Natural Resource Center has been collecting physical and biological fisheries data which are used to develop policies for harvest, protection, and enhancement of fisheries resources.

Projects planned for 1981, and future years, include stream surveys, which will entail estimating spawning bed magnitude of most of the Annette Island's salmon-producing streams, measuring streamflows, examining water quality, and setting recommended escapement levels for the streams. The survey will extend well into the fishing season, during which time escapement counts will be gathered (enabling a base for island production estimates). In addition, the water quality program will be continued and expanded in 1981, increasing the Annette Natural Resource Center's data base.

A stream rehabilitation program has benn initiated beginning in the fall of 1981, intended to reduce fish migration blockages in certain creeks and to enhance natural production. Details on the program will be available at a later date.

The fish traps can and have been used to collect data on salmon migration. They will continue to be used to study the timing and other characteristics of the salmon runs using Annette Islands waters and the traps lend themselves very well for mark and recapture studies. A cooperative effort between the ADF&G and the Annette Natural Resource Center could take advantage of the research potential of these traps.

Finally, a 1980 feasibility study examined the potential production increases in sockeye salmon in Trout Lake with lake fertilization. The potential is good, with a high benefit-cost ratio estimate (Pacific Rim Planners, Inc., 1980). The lake fertilization project, plus the improved management practice and stream programs planned, will all work to enhance Annette Island's salmon production and provide a data base for sound resource management plans. In addition, the hatchery and resultant natural production increases should produce fish that will be taken in the State-managed districts.

Closures

The ultimate mitigating measure is the authority of the BIA Area Director to close the fishery based on the assessment of the condition of the resources. Exercised in the past, this authority assures that the three criteria outlined in the regulations will be met.

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APPENDIX A
Presidential Proclamation of 1916

(ANNETTE ISLAND FISHERY RESERVE,ALASKA.)

By the President of the United States of America

A PROCLAMATION.

WHEREAS it is provided by section fifteen, of the act of Congress, approved March third, eighteen hundred and ninety-one, entitled "An Act To repeal timber-culture laws, and for other purposes," that "Until otherwise provided by law, the body of lands known as Annette Islands, situated in the Alexander Archipelago in southeastern Alaska, on the north side of Dixon's entrance, be, and the same is hereby, set apart as a reservation for the use of the Metlakatla Indians, and those people known as Metlakatlans, who have recently emigrated from British Columbia to Alaska, and such other Alaskan natives as may join them, to be held and used by them in common, under such rules and regulations, and subject to such restrictions, as may be prescribed from time to time by the Secretary of the Interior,"and

WHEREAS the Secretary of the Interior, with a view to assisting the Metlakatlans to self-support, has decided to place in operation a cannery on Annette Island; and

WHEREAS it is therefore necessary that the fishery in the waters contiguous to the hereinafter described group comprising the Annette Islands be reserved for the purpose of supplying fish and other aquatic products for said cannery;

Now, therefore, I, WOODROW WILSON, President of the United States of America, by virtue of the power in me vested by the laws of the United States, do hereby make known and proclaim that the waters within three thousand feet from the shore lines at mean low tide of Annette Island, Ham Island, Walker Island, Lewis Island, Spire Island, Hemlock Island, and adjacent rocks and islets, located within the area segregated by the broken line upon the diagram hereto attached and made a part of this proclamation, also the bays of said islands, rocks, and islets, are hereby reserved for the benefit of the Metlakatlans and such other Alaskan natives as have joined them or may join them in residence on these islands, to be used by them under the general fisheries laws and regulations of the United States as administered by the Secretary of Commerce.

Warning is herby expressly given to all unauthorized persons not to fish in or use any of the waters herein described or mentioned.

In Witness Whereof, I have hereunto set my hand and caused the seal of the United States to be affised.

Done at the City of Washington this 28th day of April, in the year of our Lord one thousand nine hundred and sixteen, and of the Independence of the United States the one hundred and fortieth.

(seal.)

WOODROW WILSON

By the President:
Robert Lansing
Secretary of State.

APPENDIX B

1960 Fishing Regulations

Title 25—[illegible]

Chapter I—Bureau of Indian Affairs, Department of the Interior

SUBCHAPTER H—ECONOMIC ENTERPRISES

PART 88—COMMERCIAL INDIAN FISHING IN ALASKA

On page 3079 of the FEDERAL REGISTER of April 9, 1960, there was published a notice of intention to amend Subchapter H of 25 CFR by adding Part 88. The purpose of this amendment is to perpetuate certain fishing rights long recognized by Federal statutes, regulations, and custom and secured to the Alaska Eskimos, Indians and Aleuts by section 4 of the Alaska Statehood Act of July 7, 1958.

Interested persons were given an opportunity to submit their views, data, or arguments in writing on the proposed regulations to the Commissioner, Bureau of Indian Affairs, Washington 25, D.C. within 30 days from the date of publication of the notice in the FEDERAL REGISTER.

Several comments regarding the proposed regulations were received. They dealt mainly with the sections providing for the authorization of fishtrap operation by three native communities of Kake, Angoon and Metlakatla, and the declaration of an exclusive fishery at the Karluk reservation.

The written comments, suggestions and objections were thoroughly considered and discussed during the 30 day period.

In addition, in response to their request to be heard, an opportunity was extended to seven Alaska canneries operating on Kodiak Island to orally present their view on the proposed regulations pertaining to the Karluk reservation. Further, this department sought the views of the native inhabitants of the Karluk reservation as to their plans and desires for the utilization of reservation waters for the 1960 fishing season.

At the request of the native inhabitants of the Karluk reservation, the waters of the Karluk reservation will continue to remain open to fishing by others during the 1960 season and beach seine gear as heretofore authorized will be covered in these regulations.

As a result of such consideration and discussion, the following changes have been made: The wording of § 88.2 has been revised to clarify the language pertaining to the locations and periods in which traps may be operated. The wording in § 88.2(a) as published would allow the operation of Indian traps at any time fishing was allowed by the State in the established fishing section in which the traps are located or at any time fishing was allowed in adjacent district. The newly proposed wording [illegible] in the respective sections, with one exception. In the case of Metlakatla traps the fishing season would be keyed to the purse seine fishing season in the Southeast section of Clarence Strait, and also to the seining season in the adjacent general section of the Southern District, since relatively little purse seining is conducted in the Southeast Section of Clarence Strait.

The headnote for § 88.5 published as Fishing restrictions, Karluk Indian Reservation, has been amended to read Commercial Fishing, Karluk Indian Reservation. The language of this section has also been revised, in accordance with comments received from the natives of the Karluk reservation and others, to provide that the waters of the Karluk Indian reservation shall be open to native inhabitants of the village of Karluk and vicinity and to other persons insofar as the fishing activities of the latter do not restrict or interfere with fishing by such natives. Further, the newly worded section provides for the use of beach seines up to 250 fathoms in length by natives and, prior to July 1, for their fishing up to within 100 yards of the mouth of the Karluk River.

The changes suggested in § 88.7, Personal Use fishing by native Indians, are based on the information that the Alaska regulations concerning personal use fishing are substantially the same as those previously in existence under Federal regulation.

A new part entitled Commercial Indian Fishing in Alaska containing nine sections, designated § 88.1 to 88.9, to read as set forth below is added to Subchapter H.

Sec.
- 88.1 Scope.
- 88.2 Restrictions on Indian fish traps.
- 88.3 Size and operation of Indian salmon traps.
- 88.4 Definition Karluk Indian Reservation.
- 88.5 Commercial Fishing, Karluk Indian Reservation.
- 88.6 Commercial salmon fishing by native Indians in the Yukon and Kuskokwim Rivers.
- 88.7 Personal use fishing by native Indians.
- 88.8 Modification of regulations.
- 88.9 Enforcement.

AUTHORITY: §§ 88.1 to 88.9 issued under R.S. 2 and 9, 5 U.S.C. 485, and sec. 4 of the Act of July 7, 1958, 72 Stat. 339, as amended.

§ 88.1 Scope.

The regulations in this part implement section 4 of the Act of July 7, 1958, 72 Stat. 339, as amended, by declaring existing fishing rights of Indians in Alaska and providing for the protection and control thereof. Provisions for the rights which derive from the Act of June 6, 1924, as amended, 43 U.S.C. 221 et seq., and the limitations and sanctions

part are permissive, but shall not be construed as a limitation upon any native rights not mentioned in this part.

§ 88.2 Restrictions on Indian traps.

(a) Subject to the limitations of paragraph (c) of this section, not more than twenty-one salmon fish traps may be, but are not required to be, utilized for the purpose of salmon trap fishing by Indian villages. Such fish trap operations, if the natives elect to engage in them, shall be conducted as heretofore only at sites hereinafter described, and within the fishing districts and fishing sections defined in the 1960 edition of the Regulations of the Alaska Board of Fish and Game for Commercial Fishing in Alaska.

(b) Angoon Community Association: Salmon trap fishing is permitted, but not required, at the following sites within the southern section of the western district when any salmon purse seine fishing is permitted by the State of Alaska in the southern section of the western district:

(1) Chicago Island at 57°36'16" north latitude, 134°51'34" west longitude.

(2) Admiralty Island at 57°22'28" north latitude, 134°34'18" west longitude.

(3) Killisnoo Island at 57°28'15" north latitude, 134°36'35" west longitude.

(4) Admiralty Island at 57°13'52" north latitude, 134°39'05" west longitude.

(c) Organized Village of Kake: Salmon trap fishing is permitted but not required, at the following sites within the General Section of the eastern district when any salmon purse seine fishing is permitted by the State of Alaska in the General Section of the eastern district:

(1) Stephens Passage at 57°21'20" north latitude, 133°27'02" west longitude.

(2) Frederick Sound at 57°11'27" north latitude, 133°34'02" west longitude.

(3) Frederick Sound at 57°10'52" north latitude, 133°32'44" west longitude.

(4) Admiralty Island at 57°18'40" north latitude, 133°57'21" west longitude.

(5) Admiralty Island at 57°10'29" north latitude, 134°12'53" west longitude.

(6) Herring Bay at 57°07'21" north latitude, 134°19'45" west longitude.

(7) Admiralty Island at 57°04'02" north latitude, 134°25'20" west longitude.

(8) Kuprenof Island at 57°01'23" north latitude, 134°02'50" west longitude.

(9) Kuiu Island at 56°55'52" north latitude, 134°16'08" west longitude.

(d) Metlakatla Indian Community (Annette Island Reserve): Salmon trap fishing is permitted, but not required, at the following sites within the southeast section of the Clarence Strait District from the opening date set by the State of Alaska for any salmon purse seine fishing in the General Section of the southern district to the closing date set by the State for any salmon purse seine fishing in the southeast section of the Clarence Strait District, or one week following the closing date set by the State for any salmon purse seine fishing in the General Section of the southern district, whichever date is later:

(1) Annette Island at 55°15'09" north latitude, 131°36'00" west longitude.

(2) Annette Island at 55°12'52" north latitude, 131°36'10" west longitude.

(3) Annette Island at 55°02'47" north latitude, 131°38'53" west longitude.

(4) Annette Island at 55°05'41" north latitude, 131°36'39" west longitude.

(5) Annette Island at 55°01'54" north latitude, 131°38'36" west longitude.

(6) Annette Island at 55°00'45" north latitude, 131°38'30" west longitude.

(7) Annette Island at 54°59'41" north latitude, 131°36'48" west longitude.

(8) Ham Island at 55°10'13" north latitude, 131°19'31" west longitude.

(e) During the 1960 fishing season and until the Secretary or his authorized representative determines otherwise, and if the villages elect to operate any fish traps, the villages may operate traps only at the following sites: Angoon: (1), (2), and (4); Kake: (3), (4), (8), and (9); Metlakatla: (2), (3), (4), and (6).

§ 88.3 Size and operation of Indian salmon traps.

(a) No trap shall extend more than 900 feet from shore to the outer face of the pot as measured at mean high tide when any part is in a greater depth of water than 100 feet.

(b) Poles shall be permanently secured to the webbing at each side of the mouth of the pot tunnel and shall extend from the tunnel floor to a height of at least 4 feet above the water. A draw line shall be reeved through the lower end of both poles and the top of one. During any period when commercial net fishing for salmon is prohibited by the State of Alaska in the water open to trap fishing as above described, the tunnel walls shall be overlapped as far as possible, the line pulled tight and both secured so as to close the trap to fishing. In addition 25 feet of the webbing of the heart on each side next to the pot shall be lifted or lowered in such manner as to permit the free passage of salmon and other fish.

FRED A. SEATON,
Secretary of the Interior.

MAY 25, 1960.

[F.R. Doc. 60-4944; Filed, June 1, 196 8:48 a.m.]

25 F.R. 4864
Thursday, June 2, 1960

Title 25—INDIANS

Chapter I—Bureau of Indian Affairs, Department of the Interior

SUBCHAPTER H—ECONOMIC ENTERPRISES

PART 88—INDIAN FISHING IN ALASKA

Commercial Fishing, Annette Islands Reserve

There was published in the FEDERAL REGISTER on April 9, 1968 (33 F.R. 5544), a notice of intention to amend paragraphs (c) and (e) of § 88.3 of the Code of Federal Regulations, Title 25—Indians, as set forth below. The purpose of the amendments is to maintain the regulatory pattern established by the regulations issued in 1960.

Interested persons were given 30 days within which to submit written comments, suggestions or objections, with respect to the proposed amendments. After careful consideration of the comments received, it has been determined that the amendments as proposed are desirable and necessary in order to assure equitable treatment for the Metlakatla Indian Community. Accordingly, paragraphs (c) and (e), of § 88.3, Code of Federal Regulations, Title 25—Indians, are amended as set forth below, effective upon publication in the FEDERAL REGISTER.

STEWART L. UDALL,
Secretary of the Interior.

AUGUST 2, 1968.

§ 88.3 Commercial fishing, Annette Islands Reserve.

* * * * *

(c) *Trap fishing season.* Fishing for salmon with traps operated by the Metlakatla Indian Community is permitted only at such times as commercial salmon fishing with purse seines is permitted by order or regulation of the Alaska Board of Fish and Game for Commercial Fishing in any part of the following area: from the point at which meridian 132°17'30" intersects the United States-Canadian boundary due north along said meridian to latitude 55°33'00", thence due east along said parallel to longitude 130°49'15", thence due south along said meridian to the point at which it intersects with the United States-Canadian boundary, thence due west along said boundary to the point of beginning.

* * * * *

(e) *Other forms of commercial fishing.* All commercial fishing, other than salmon fishing with traps, shall be in accordance with the season and gear restrictions established by rule or regulation for Fishing District No. 1F by the Alaska Board of Fish and Game for Commercial Fishing except that the season for purse seine fishing for salmon shall be same as provided in paragraph (c) of this section.

[F.R. Doc. 68-9623; Filed, Aug. 13, 1968; 8:46 a.m.]

Title 28—JUDICIAL ADMINISTRATION

Chapter I—Department of Justice

[Order 402-68]

PART 0—ORGANIZATION OF THE DEPARTMENT OF JUSTICE

Subpart K—Criminal Division

PAYMENT OF BENEFITS FOR DISABILITY OR DEATH OF LAW ENFORCEMENT OFFICERS NOT EMPLOYED BY THE UNITED STATES

By virtue of the authority vested in me by sections 509 and 510 of Title 28 and sections 301 and 8193(b)(1) of Title 5 of the United States Code, Subpart K of Part 0 of Chapter I of Title 28 of the Code of Federal Regulations is amended by inserting immediately after § 0.57 a new § 0.58 as follows:

§ 0.58 Delegation respecting payment of benefits for disability or death of law enforcement officers not employed by the United States.

The Assistant Attorney General in charge of the Criminal Division is authorized to exercise or perform any of the functions or duties conferred upon the Attorney General by the Act to Compensate Law Enforcement Officers not Employed by the United States Killed or Injured While Apprehending Persons Suspected of Committing Federal Crimes (5 U.S.C. 8191, 8192, 8193).

The amendment made by this order shall be effective upon publication in the FEDERAL REGISTER.

Dated: August 8, 1968.

RAMSEY CLARK,
Attorney General.

[F.R. Doc. 68-9747; Filed, Aug. 13, 1968; 8:51 a.m.]

Title 29—LABOR

Chapter XIV—Equal Employment Opportunity Commission

PART 1604—GUIDELINES ON DISCRIMINATION BECAUSE OF SEX

Job Opportunities Advertising

On April 14, 1967, the Equal Employment Opportunity Commission published a notice (32 F.R. 5999) of proposed interpretative rules which stated that amendments to the Commission's Guidelines on Discrimination Because of Sex were being considered. The subject matter of the amendments included a revision of the Commission's position with regard to job opportunities advertising set forth at 29 CFR 1604.4 (31 F.R. 6414, Apr. 28, 1966) in accord with a petition filed pursuant to 29 CFR 1601.22. The notice stated that a public hearing on this and other questions involving the Commission's Guidelines on Discrimination Because of Sex would be held on May 2 and 3, 1967; interested persons were invited to participate. After consideration of the petition, the testimony presented at the hearings, and statements submitted in connection with the hearing, the Commission herewith revises 29 CFR 1604.4 in its entirety, effective December 1, 1968, to read as follows:

§ 1604.4 Job opportunities advertising.

It is a violation of Title VII for a help-wanted advertisement to indicate a preference, limitation, specification, or discrimination based on sex unless sex is a bona fide occupational qualification for the particular job involved. The placement of an advertisement in columns classified by publishers on the basis of sex, such as columns headed "Male" or "Female," will be considered an expression of a preference, limitation, specification, or discrimination based on sex.

Signed at Washington, D.C., this 9th day of August 1968.

CLIFFORD L. ALEXANDER, Jr.,
Chairman.

[F.R. Doc. 68-9749; Filed, Aug. 13, 1968; 8:51 a.m.]

Title 31—MONEY AND FINANCE: TREASURY

Chapter II—Fiscal Service, Department of the Treasury

SUBCHAPTER B—BUREAU OF THE PUBLIC DEBT

PART 342—OFFERING OF UNITED STATES SAVINGS NOTES

Description of Notes

Correction

In F.R. Doc. 68-8234 appearing at page 11208 in the issue of Thursday, August 8, 1968, in the table of § 342.2(c), the third figure in the "Denomination" column should read "75.00".

Title 45—PUBLIC WELFARE

Chapter I—Office of Education, Department of Health, Education, and Welfare

PART 177—FEDERAL, STATE AND PRIVATE PROGRAMS OF LOW-INTEREST LOANS TO STUDENTS IN INSTITUTIONS OF HIGHER EDUCATION

Maximum Interest Rate

Section 177.35(a) dealing with the maximum rate of interest that may be charged on the unpaid principal balance of loans insured under the Federal loan insurance program is hereby amended to provide for an increased in such maximum rate from 6 percent per year to 7 percent per year. As so amended, § 177.35 (a) reads as follows:

§ 177.35 Rate of interest; late charges.

(a) *Rate of interest.* The maximum rate of interest on the unpaid principal

APPENDIX D

1975 Fishing Regulations

DEPARTMENT OF THE INTERIOR
Bureau of Indian Affairs
25 CFR Part 88.1
May 28, 1975
INDIAN FISHING IN ALASKA
Annette Island Reserve

Basis and Purpose. Pursuant to the authority contained in the Acts of March 3, 1891 (26 Stat. 1101), May 1, 1936 (49 Stat. 1250), and June 25, 1959 (73 Stat. 141), and Presidential Proclamation of April 28, 1916 (39 Stat. 1777), it is proposed to amend subsections (c) and (e) of section 88.3 of the Code of Federal Regulations, Title 25 -- Indians, dealing with the salmon trap fishing season and fishing area within the Annette Island Reserve by the Metlakatla Indian Community, Alaska. The purpose of this amendment is to permit the Metla - katla Indians and those people known as Metlakatlans an equal oppor - tunity to catch their fair share of the total annual salmon run.

It is the policy of the Department of the Interior, whenever practicable, to afford the public an opportunity to participate in the rule-making process. As a result of Supreme Court decision, Alaska Pacific Fisheries v. United States, 248 U.S. 78 (1918), the submission of written comments, suggestions and objections to this amendment are hereby waived and the amendments cited below will be - come effective on date of publication in the FEDERAL REGISTER.

Paragraphs (c) and (e) of § 88.3 are amended to read as follows:

§ 88.3 Commercial fishing, Annette Island Reserve

* * * * *

(c) Trap fishing season. Fishing for salmon with traps oper- ated by the Metlakatla Indian Community is permitted only at such times as commercial salmon fishing with purse seines is permitted by order or regulation of the Alaska Board of Fish and Game for Commercial Fishing in any part of the following area: from the point at which meridian 132° 17'30" intersects the United States-Canadian boundary due north along said meridian to latitude 55° 33'00", thence due east along said parallel to longitude 130 49'15", then due south along said meridian to the point at which it intersects with the United States-Canadian boundary, thence due west along said boundary to the point of beginning, provided, however, that the Secretary or his duly authorized representative may upon request by the Metlakatla Indian Community, authorize fishing for salmon with traps, at such other

times as he shall prescribe, which authorization shall be based upon the following criteria:

1. number of fish required for spawning escapement and any other requirements reasonable and necessary for conservation;

2. fair and equitable sharing of the salmon resource with other user groups fishing in State waters under State law and

3. the federal purpose in the establishment and maintenance of the Metlakatla Indian Reservation.

(e) Other forms of commercial fishing. All commercial fishing, other than with traps, shall be in accordance with the season and gear restrictions established by rule or regulation by the Alaska Board of Fish and Game for Commercial Fishing in any part of the previously defined area; provided, however, that the Secretary or his duly authorized representative may, upon request by the Metlakatla Indian Community authorize such other commercial fishing at such times as he shall prescribe, which authorization shall be based upon the following criteria:

1. number of fish required for spawning escapement and any other requirements reasonable and necessary for conservation;

2. fair and equitable sharing of the fishery resource with other user groups fishing in State waters under State law and within the State fisheries management system; and

3. the federal purpose in the establishment and maintenance of the Metlakatla Indian Reservation.

Signature
Morris Thompson
Commissioner of Indian Affairs

APPENDIX E

This appendix describes the data sources and methods which were used in estimating catch levels for each of the 1980 management alternatives.

DATA SOURCES

1) Catch Data

Historical catch statistics were obtained from computer runs prepared by the Alaska Department of Fish and Game (ADF&G) for the period 1969 through 1980. Data were disaggregated by statistical area for the southern southeast region (Districts 1 through 8) by gear type, and by week. Catch records specific to the Annette Islands Reserve fishery (for gear types other than traps) were available only for the years 1978-1980. During previous years, reserve harvests were reported in State sub-area totals. This scarcity of local data prevented the estimation of catch per unit effort (CPUE) factors specific to the Community's fleet and its fishery.

2) Fishing Periods

Records of the number of fishing days (converted to 24 hour equivalents) during which any management area was open to fishing by a specific gear type were obtained from the ADF&G area office in Ketchikan for Districts 1 through 4. This "openings" data provided a basis for projecting the number of days of fishing time likely to be authorized in State waters during 1981. It was also used in the calculation of total vessel-hours, i.e. the number of vessels fishing in a specific district multiplied by the number of hours of authorized fishing time (used as a measure of total effort in catch per unit effort calculations). It should be noted here that overlapping fishing days were not double-counted in those instances where fishing periods were aggregated for more than one district. (See fishing period totals for Districts 1-4 seine fishery in Table E-2).

3) Fishing Effort

Several measures of fishing effort were analyzed for this study. Landings data (the number of vessel deliveries) and fleet size estimates were obtained for each gear type from the ADF&G statistical runs. Landings data were applied directly to catch totals to derive catch per landing values for purse-seine and gillnet fleets in areas adjacent to Annette Island. At the same time, the number of *vessels* operating in a given area are compared with the number of authorized *fishing hours* to provide a basis for calculating catch per vessel per hour.

4) AIPC Production Data

Annette Island Packing Company profit and production values were obtained for the period 1969 through 1980 from annual financial reports and from the annual edition of the *Pacific Packers Report* (a supplement to the *National Fisherman*). Frozen and canned production statistics derived from these sources were adjusted to reflect round weights at time of delivery (raw pounds of fish). This total delivery weight was then converted to an estimate of the total number of fish delivered using an average weight per fish of 4.5 pounds based on AIPC production experience.

5) Other Data

A variety of other data sources were reviewed during the course of this analysis, including:

Pink salmon escapement data for districts 1 through 8 for the period 1960 through 1980--obtained from ADF&G,

Pink salmon run forecasts prepared each year for southeast Alaska by ADF&G for the period 1970 through 1981,

Annual purse-seine and gillnet salmon management plans--prepared by ADF&G for Southeast Alaska (1976-1981),

Annette Islands Reserve trap catch records compiled by week for the period 1963 to 1980--obtained from the Annette Natural Resources Center and the Bureau of Indian Affiars,

Tagging and recovery data of pink salmon from 1979, Annette Island Escapement and Flight survey data, and miscellaneous data available at the Annette Natural Resources Center.

APPROACH AND METHODOLOGY

Catch Per Unit Effort--Overview

Estimation of 1981 harvest levels began with the specification of catch per unit effort (CPUE) factors for trap, purse-seine and drift gillnet gear types in areas adjacent to Annette Island. Several measures--catch per vessel per landing and catch per vessel per hour--were developed from catch and effort statistics for the period 1974 through 1980. Fluctuations in these measures were then correlated with changes in the total salmon harvest levels in southern southeast Alaska. The resulting relationship (a linear equation) was used to specify CPUE factors consistent with the run size predicted for 1981.

Specification of appropriate CPUE factors for 1981 proved to be a most difficult taks. The lack of historical information specific to the reserve fishery (except for traps) forced the use of *areawide* factors, i.e., gillnet catch rates covering all of District 1 and purse-seine factors aggregated for Districts 1 and 2. An implicit assumption (again mandated by time and data constraints) that catch rates would not be affected by increasing

concentrations of gear, introduces another bias. This latter simplification suggests that Community harvest forecasts may be significantly overestimated given the high gear concentrations contemplated in each of the alternatives. Finally, specification of 1981 CPUE factors was hindered by a lack of strong statistical correlation between harvest levels in SSE Alaska and historical measures of CPUE for gillnet and trap gear types (See Table E-4). In response to this final complication, a number of alternative measures (mean values, adjusted means, selected historical values) were considered, but finally rejected in favor of the simple linear equation estimates (See Table E-5).

Catch Per Unit Effort--Trap Gear

Table E-1 summarizes the catch levels and catch rates achieved by the Community's traps between 1974 and 1980. When correlated with SSE Alaska harvest totals, this data generated a 1981 CPUE estimate of 142.0 fish per trap per hour of 3408 fish per trap per day (see Table E-4). As seen in Table E-5, this 1981 estimate is significantly higher than the average catch rates achieved during the past seven years.

Catch Per Unit Effort--Purse-Seine Fleet

Table E-2 details the catch rates achieved by the purse-seine fleet in areas adjacent to Annette Island between 1974 and 1980. Unfortunately, since an adequate time series could not be generated for the reserve fishery alone, consideration was thus given to more extensive areas--Districts 1 and 2 and Districts 1 through 4. Statistical correlations performed on these data sets generated 1981 catch rate estimates of 1,317 fish per landing for Districts 1-4 and 1,617 fish per landing for Districts 1 and 2.* (See Table E-4.) These catch per landing estimates were converted to a per day basis using the average number of landings made by each vessel during 24 hour periods. Since this conversion factor approximated 1.0, numerical changes were not needed in the final 1980 CPUE estimates.

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*Unusually high correlation coefficients were obtained for these data sets (R^2 = .78 and R^2 = .94, respectively), perhaps due to the large share of the total SSE harvest captured by the purse-seine fleet.

TABLE E-1

ANNETTE ISLAND TRAP GEAR
Catch Per Unit Effort

1963-1980

Year	Total Trap Catch	No. of 24 hr. Fishing Days	No. of Traps	Total Trap Fishing Hours	Catch Per Trap Per Hour
1980	460,544	31.0	4	2,976	154.8
1979	213,140	29.0	4	2,784	76.6
1978	693,700	34.0	4	3,264	212.5
1977	311,900	24.0	4	2,304	135.4
1976	444,917	22.0	4	2,112	210.7
1975	110,511	12.0	4	1,152	95.9
1974	113,064	11.2	4	1,068	105.9

Average 1974 - 1980

All Years	335,397
Even Years	428,056
Odd Years	211,850

Source: Annette Natural Resources Center and Bureau of Indian Affairs (unpublished data).

TABLE E-2

PURSE SEINE GEAR
Catch Per Unit Effort

1974-1980

Area/Year	Total Catch (1,000 fish)	Number of Landings	Number Vessel Hours	Catch Per Landing	Catch Per Vessel Hour
District 101-104					
1980	12,654.0	8,132	288,750	1,556	
1979	4,445.4	4,121	n/a	1,079	n/a
1978	15,797.0	8,353	281,714	1,891	56.1
1977	7,812.2	4,647	85,638	1,681	91.2
1976	4,192.2	4,007	92,216	1,046	43.6
1975	2,524.8	2,610	66,166	967	38.1
1974	4,037.6	4,184	88,320	965	45.7
District 101-102					
1980	6,461.1	3,340	141,240	1,936	
1979	2,029.5	1,246	n/a	1,628	n/a
1978	12,608.4	5,944	202,800	2,121	62.2
1977	6,117.9	2,850	56,610	2,147	108.1
1976	2,450.7	1,852	52,240	1,323	46.9
1975	1,712.4	1,429	41,180	1,198	41.6
1974	2,028.8	2,169	49,800	935	40.7
Annette Island Districts					
1980 Totals	484.4	224		2,162.5	
101-24	240.4	118		2,037	
101-26	186.1	62		3,001	
101-28	9.5	7		1,362	
101-42	48.3	37		1,306	

Source: Annette Natural Resources Center, based on unpublished Alaska Department of Fish & Game Data.

TABLE E-3

DRIFT GILLNET GEAR
Catch Per Unit of Effort

1974-1980

Area/Year		Total Gillnet Catch (1,000 fish)	Number of Landings	Number Vessel Hours	Catch Per Landing	Catch Per Vessel Hour
District 101						
1980		1,209.7	3,687	298,368	328	4.1
1979		315.4	2,626	n/a	120	n/a
1978		920.6	4,652	120,000	197	7.2
1977		1,157.6	3,787	105,634	305	11.0
1976		401.9	2,392	70,512	168	5.7
1975		206.8	2,147	62,040	96	3.3
1974		383.8	3,664	86,688	105	4.4
Annette Islands Reserve						
1979 (101-28)		58.7	363	12,144	162	4.8
1979 (101-42)		8.5	57	2,472	149	3.4
1978 (101-28)		37.3	220	5,448	169	6.8
1978 (101-42)		20.3	115	3,168	176	6.4
1978 (101-24)		10.1	52	1,272	194	7.9
	Boats					
1980 (101-24)	29	65.4	208	39,672	314.4	1.65
1980 (101-26)	24	39.8	118	32,832	337.3	1.21
1980 (101-28)	33	129.5	438	45,144	295.7	2.87
1980 (101-42)	14	14.2	50	19,152	284.0	.74

Source: Annette Natural Resources Center, based on Alaska Department of Fish & Game unpublished data.

TABLE E-4

SUMMARY OF LINEAR REGRESSION CATCH PER UNIT EFFORT (CPUE) ESTIMATES FOR TRAP, PURSE SEINE AND GILLNET GEAR TYPES

Gear Type	CPUE Type (1)	Area	Period	1981 CPUE Estimates (2)			Equation Parameters (3)		Correlation Coefficient	S.E. (4)
				Point	High	Low	Intercept = b	Slope = m	$= R^2$	
AIR Traps	Catch/Trap Hour	Annette Island	1974-1980	142.0	164.4	123.6	85.6	+.0056	.30	53.2
Seine Fleet	Catch/Landing	Districts 1-2	1974-1980	1,617.6	1,936.5	1,354.5	812.4	+.0797	.78	261.4
Seine Fleet	Catch/Landing	Districts 1-4	1974-1980	1,316.6	1,599.9	1,082.9	601.2	+.0708	.94	112.2
Gillnet Fleet	Catch/Landing	District 1	1974-1980	189.2	239.8	147.5	61.5	+.0126	.50	78.5

Notes:

(1) Catch per vessel landing values were converted to catch per vessel day values using the average number of landings per day calculated for purse seine and gillnet gear types. Between 1974 and 1978, purse seine vessels made average of 1.01 landings per day; therefore the catch/landing value becomes a fair measure of the average catch per day. For gillnetters, however, an average of 0.87 to 0.9 landings were made each day. The catch per vessel day factors used in calculating 1981 gillnet harvest levels were thus adjusted to 170.0 fish per vessel day (=189.2 fish/landing x 0.9 adjustment factor).--See Table A-6.

(2) Three estimates were made for each gear type CPUE factor, consistent with the forecast range prepared by ADF&G for the salmon run in Southern Southeast Alaska. The point estimate is based upon ADF&G's mid-range prediction of 10.1 million fish; the high estimate is consistent with the peak expected harvest of 14.1 million fish and the low estimate correlates with the low-range harvest forecast of 6.8 million fish.

(3) Linear regression equations were of the general form, ($y = mx + b$) where (y) equals the CPUE measure, (x) equals the independent variable (total catch for Southern Southeast Alaska), (b) equals the y intercept and (m) equals the expected slope of the line.

(4) S.E.--standard error of the predicted point CPUE estimate. Normal distribution, 95% confidence interval established at ±2 (S.E.).

Source: Annette Natural Resources Center

TABLE E-5
ALTERNATIVE MEASURES OF CPUE FOR TRAP, PURSE SEINE, GILLNET GEAR TYPES

Gear Type - Area	CPUE Type	Historical Avg, Odd Yrs	Adjusted Avg. Odd Yrs[1]	1977 Value[2]	Regression Estimate
Trap Annette Island	Catch/Trap Hr	102.6	123.7	135.4	142.0
Seine Districts 1-2	Catch/landing	1657.0	1989.2	2147.0	1617.6
Seine Districts 1-4	Catch/landing	12.42.0	1490.4	1681.0	1316.6
Gillnet District 1	Catch/landing	173.7	208.4	305.0	189.2

Notes:

1. Historical averages were adjusted to reflect the relatively moderate total harvest levels predicted for 1981. Adjustment was made with a catch index (= 1.20) equal to the average odd year harvest level (=8.4 million fish) divided into the 1981 point forecast (= 10.1 million fish).

2. 1977 CPUE values were selected as comparative measures due to the similarity in total harvest size. Note, however, that the 1977 season recorded a catch level that was 25% higher than that forecasted for 1981 (i.e. 12.7 million fish in 1977 vs. 10.1 million fish expected in 1981).

Source: Annette Natural Resources Center.

Fishing Periods -- Overview

Following the specification of 1981 catch rates, study efforts focused on estimating the number of days during which fishing was likely to be permitted in State and/or Reserve waters. Because Reserve openings are regulated by both BIA and ADF&G management policies, three items of information had to be assembled for previoue years:

1) The number of fishing days authorized by ADF&G in State waters adjacent to Annette Island;
2) the number of fishing days authorized by the Area Director for each gear type in Reserve waters; and
3) the degree of coincidence between State and BIA-authorized openings.

Fishing Periods -- State Authorized Openings

State fishing periods were assumed to be fixed at levels consistent with past management experience and the 1981 harvest forecast. To derive these estimates, the number of historical openings in the Ketchikan management area (See Table E-7) were correlated with SSE Alaska catch levels during the period 1975-1980. These regressions suggested that the State will probably open the purse seine fishery in Districts 1-4 for 25 days, (in Districts 1-2 for 16 days) and the gillnet fishery (in District 1) for 38 days. These regression estimates were then contrasted with the State's intended policies reflected in their 1981 gillnet and purse seine management plans. The seasonal distribution of fishing periods resulting from

Catch Per Unit Effort -- Gillnet Fleet

Table E-3 summarizes gillnet fleet catch data for both the Annette Islands Reserve fishery and the more ectensive District 1 fishery. Due to scarcity of local data, District 1 catch rates were selected as representative measures of local efficiency. Catch per landing values (vs. catch per hour factors) were also selected as more reliable predictors due to the continuity and consistency of the statistical records. Both data sets, however, generate the same range of results, equal to 170 fish caught per vessel per day once the catch per landing values are converted to a catch per day basis* (see Tables E-4 and E-5).

Catch Per Unit Effort -- Summary

Table E-5 summarizes the various measures of Catch Per Unit Effort (CPUE) which were evaluated as part of this analysis. For all cases, regression estimates were selected as the most appropriate forecast variables for 1980. Prior to their use, these measures were converted from a catch per hour or a catch per landing basis to a catch per vessel per day basis. Table E-6 summarizes regression estimates and converted catchper unit effort values for Reserve and State fishery gear types.

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* As seen in Table E-4, the actual catch per landing point estimate for 1980 was estimated at 189.2 fish per landing. This estimate was converted to a catch per vessel per day value using an adjustment factor of 0.9 landings made by the average gillnet vessell during 24-hour periads (see footnote #1 to Table E-4).

TABLE E-6
CATCH PER UNIT EFFORT ESTIMATES FOR RESERVE AND STATE FISHERY GEAR

Gear Type	Fishery	Regression Estimate	Conversion Factor	Final CPUE Value
Trap	Reserve	142.0 fish/hour	x 24.0	3408 f/t/d
Seine	Reserve	1617.6 fish/hour	x 1.0	1617.6 f/v/d
Seine	State	1316.6 fish/landing	x 1.0	1316.6 f/v/d
Gillnet	Both	189.2 fish/landing	x 0.9	170.3 f/v/d

Source: Annette Natural Resources Center.

this analysis is detailed for each alternative.

Fishing Periods -BIA Authorized Openings in Annette Island Reserve

Under terms of federal regulations, State-authorized openings in most subareas of Districts 1 and 2 (see figure 3) automatically initiate concurrent openings in Reserve waters. For example, a State authorized opening for gillnet gear at Tree Point results in a simultaneous Reserve opening for Community gillnetters. Similarly, State purse seine and troll openings in Districts 1 or 2 automatically open Reserve waters for identical periods. Reserve traps follow the purse seine opening schedule.

In addition to these openings, the BIA Area Director may (by designation of the U.S. Secretary of the Interior) authorize additional fishing days in Reserve waters. Each of the three study alternatives considers a different number of BIA authorized days, ranging from a low of zero for all gear types in Alternative II to 32 trap days and 52 gillnet days in Alternative I. Table E-8 summarizes these BIA-authorized openings for each alternative.

TABLE E-7
COMMERCIAL FISHING PERIODS IN STATE WATERS
1974 - 1980

Gear Type / District	Number of 24 hour fishing days[1] 1980	1979	1978	1977	1976	1975	1974
Purse Seine							
District 1	20.3	9.0	21.7	10.1	10.0	8.0	16.75
District 2	24.5	10.3	21.7	13.8	14.5	11.0	19.12
District 3	15.8	6.5	13.1	7.1	10.5	6.5	10.50
District 4	27.6	16.6	32.1	15.0	11.2	7.0	22.80
District 1-4*	34.7	23.0	32.1	21.7	25.5	18.0	26.00
District 1-2*	26.0	10.3	21.7	13.7	14.5	11.0	19.10
Gillnet							
District 1	56.0	23.0	45.0	42.0	43.0	25.0	30.5

*District 1-4 and 1-2 totals represent net rather than cummulative aggregrates; i.e., overlapping days were not double-counted.

1. Does not include fishing days in October and November (days irrelevant to A.I. Fishing)

Source: Alaska Department of Fish and Game, Ietchikan office, Unpublished data.

TABLE E-8
BIA-AUTHORIZED RESERVE
OPENINGS BY ALTERNATIVE AND GEAR TYPE

Alternative	Number of BIA Authorized Days		
	Trap	Purse Seine	Gillnet
I.	32	0	52
II.	0	0	0
III.	32		

Source: Annette Natural Resources Center.

Community Fishing Fleet

The Community's 1980 fishing fleet was assumed to have the same general size and composition as it has in previous years.

For purposes of the analysis, the Community fleet was defined as full time boats fishing for the AIPC. This included all boats owned by Community members (12 seiners and 33 gillnetters, 24 of whom lack permits to fish in State waters) and a small number of vessels (generally 4 seiners and 4 gillnetters) woned by nonmembers fishing State waters but delivering to AIPC.

The geographic distribution of fishing effort by the Community fleet (indicated in Tables 6,8,and 10) reflects the assumption that member vessels with limited entry permist would choose to fish in both State waters and Reserve waters whenever State and Reserve openings coincided. This was based on historical behavior by the Community fleet in similar stiutaions, wherein about half of the Community fishermen choose to fish off of the Reserve in order to avoid the potential of diminished catch rate due to concentration of gear within the limited area of the fishery reserve. Since available data is not sufficiently detailed to adjust catch rates according to the amount of gear fishing Reserve waters, no effort was made to adjust catch rates downward in days when only the Reserve was presumed open. The effect of this adjustment, however, would merely be to revise the estimated Community fleet catch downward, so the unadjusted figures are considered to be simply a representation of the upper range of possible Community harvests.

TABLE E-9
ESTIMATED SIZE OF COMMUNITY FLEET BY GEAR TYPE AND PERMIT CHARACTERISTICS*

	Member Vessels		Nonmember	
Gear Type	Permitted	Nonpermitted	Permitted	Total
Trap	NA	NA	NA	4
Seine	12	0	4	16
Gillnet	9	24	4	37

Note: Community fleet is defined as full-time vessels delivering all of catch to AIPC Permitted refers to vessels holding a Southeast Alaska Commercial salmon Limited entry permits. Member vessels are commercial vessels owned or operated by Community members and possessing an Annette Islands fishery permit.