ALASKA DEPARTMENT of FISH and GAME

1975 annual report

prepared by
Information and Education Section
Alaska Department of Fish and Game

Cover Photo:
Herring seiner in Yankee Cove near Juneau, spring, 1975. ADFG photo by Russ Dixon.

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STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

JAY S. HAMMOND, GOVERNOR

OFFICE OF THE COMMISSIONER / *SUBPORT BUILDING*
JUNEAU 99801

The Honorable Jay S. Hammond
Governor of Alaska
Pouch A
Juneau, Alaska 99801

Dear Governor Hammond:

The Department of Fish and Game faced major challenges in 1975 as population pressures, natural cycles, and competing social forces combined to exert their influences on the fish and game resources of Alaska.

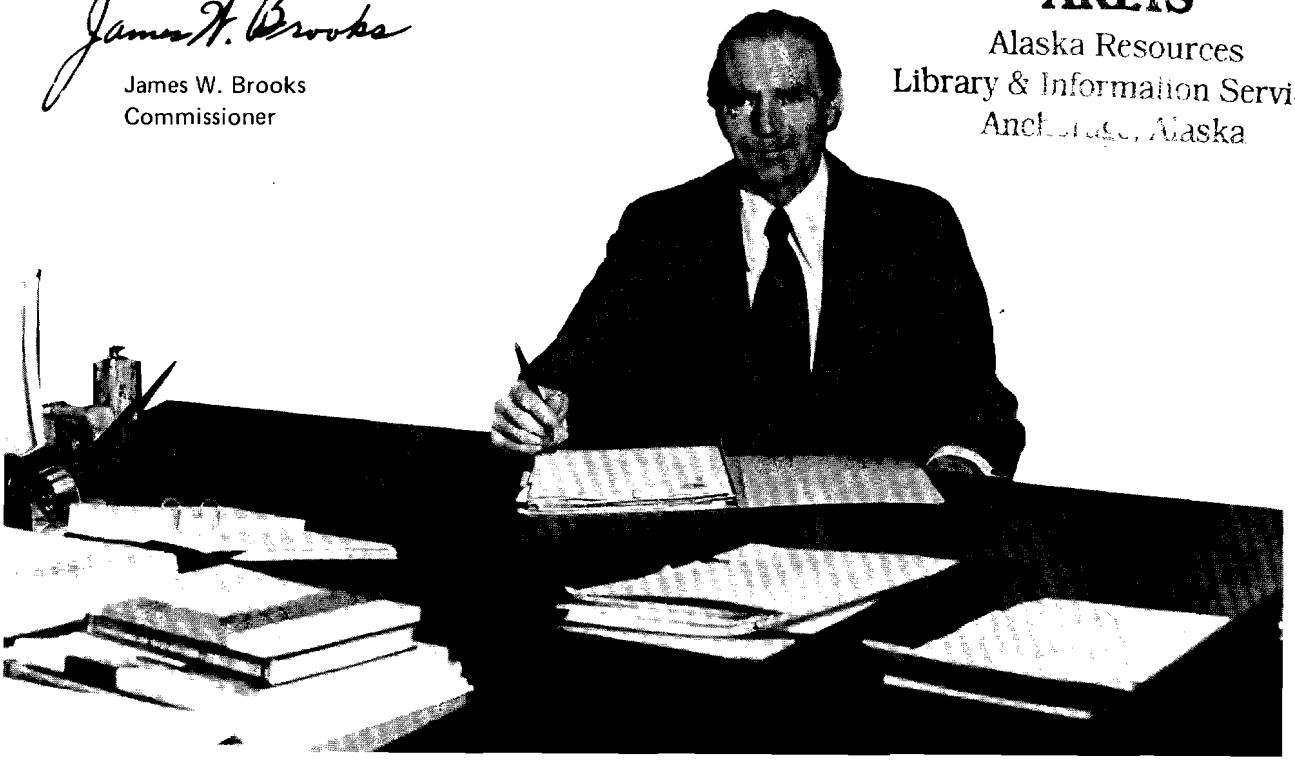
Increased interest in private salmon hatcheries, opposition to wolf control programs and problems relating to land use and habitat were just a few of the issues which confronted the department last year.

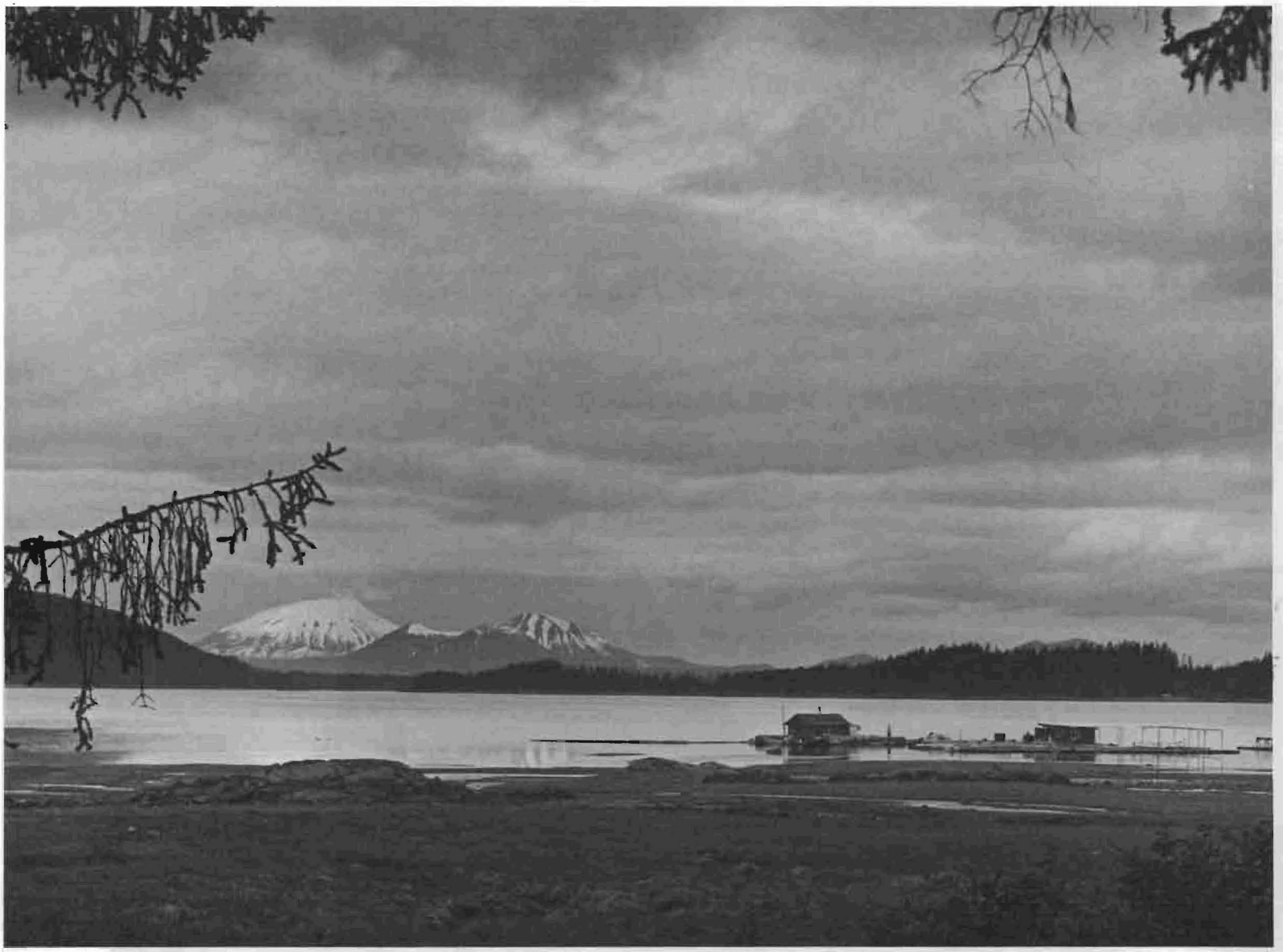
This report outlines the accomplishments of each division in the department in 1975 and we are pleased to submit it for your review.

Sincerely,

James W. Brooks

James W. Brooks
Commissioner





State of Alaska

JAY S. HAMMOND
GOVERNOR

ALASKA DEPARTMENT of FISH and GAME

1975 annual report

JAMES W. BROOKS
COMMISSIONER

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Robert S. Roys, Director FRED Division
Robert Rausch, Director Game Division
Rupert Andrews, Director Sport Fish Division

Jeff Morrison, Director Administration Division
Lowell Barrick, Chief Engineering Section
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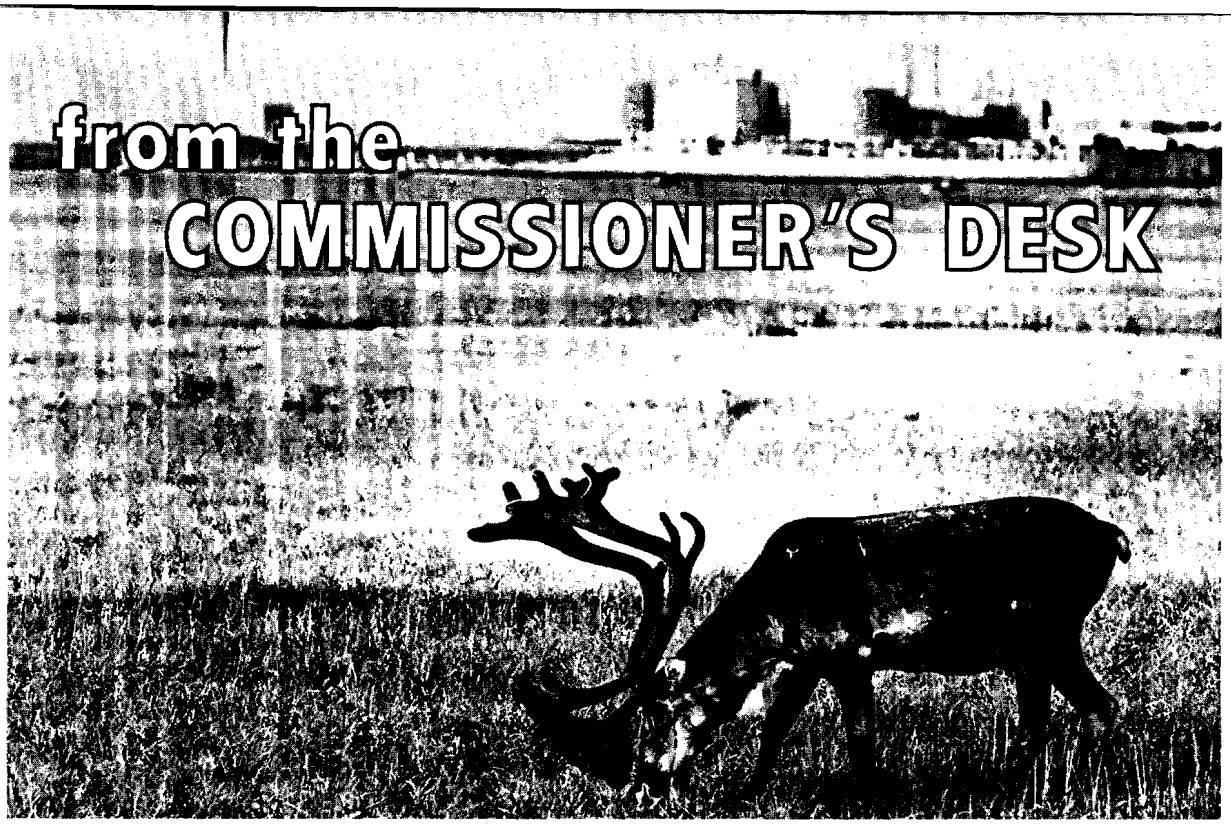
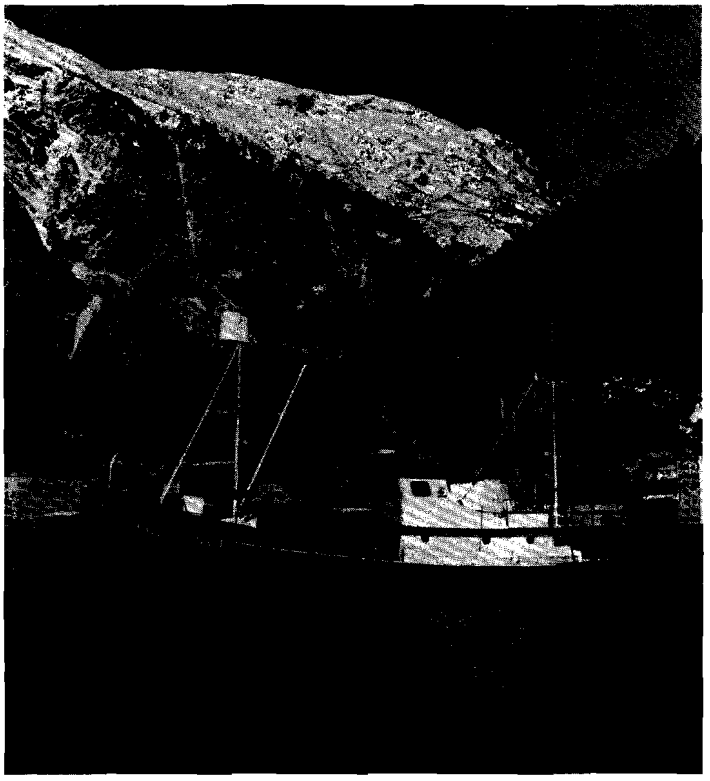
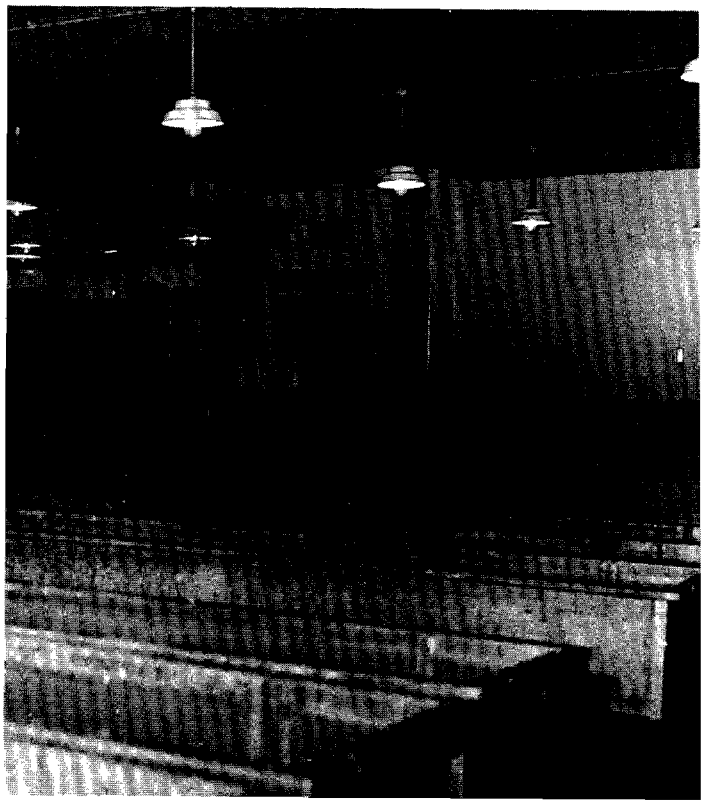


The Alaska Department of Fish and Game has trust responsibility over the state's renewable fish and wildlife resources. This responsibility includes not only protection and maintenance, but also the responsibility of assuring that these resources continue to afford Alaskans, and visitors alike, both economic and recreational opportunities. Meeting these responsibilities in 1975 has been challenging and the following annual report describes the efforts of the department to fulfill its obligations to both the resources and society. However, I would like to take a few moments here to present some of the highlights of the year.



A departmental survey, conducted in 1973, to assess the problems and needs of the department for vessels bore fruit this year in the acquisition of two additional vessels. The 66 foot M/V Pandalus was acquired, outfitted with shrimp dragging and shellfish pot gear, and assigned to the Cook Inlet region primarily in support of shellfish research and management programs. The 70 foot M/V Sundance was outfitted and assigned to the Southeastern region in support of both herring and salmon programs. These vessels will help to fulfill needs sorely felt for several years.

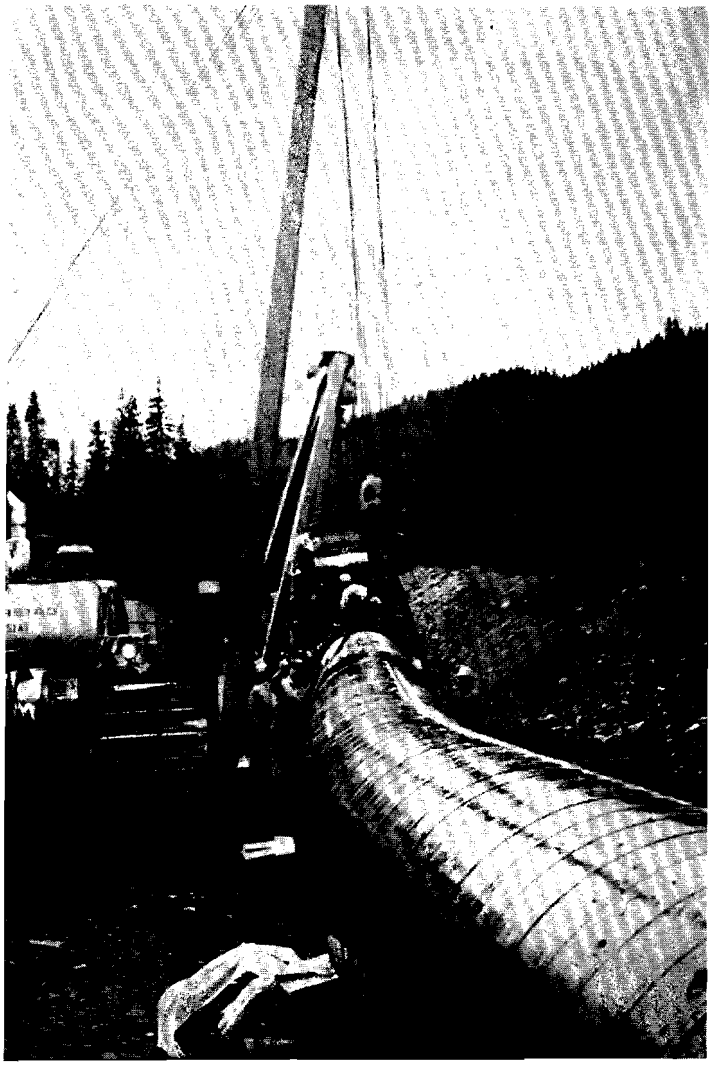


In the realm of fisheries enhancement, the first returns to the Crystal Lake Hatchery heralded the successful completion of its first coho release. Also, the first returns of marked jack and adult cohos from the Mendenhall ponds appeared and are indicative of what can be expected in 1976.

The completion of the Fisheries Pathology Laboratory in Anchorage assures the capability of processing bacteriological and preliminary virological samples in addition to parasite detection and identification. Although the control of diseases in fish stocks in their natural environment is difficult or impossible, control of disease in hatchery and rearing environments is both practical and paramount to the success of supplemental production programs.

The 1974 enactment of a statute authorizing private nonprofit salmon hatcheries requires the department to encourage and assist in the orderly and constructive participation of the private sector in the state's enhancement programs. I am pleased to report that in 1975 the department established procedures for the review and evaluation of private hatchery applications and was able to issue permits to four qualified corporations. The subsequent development of these hatcheries should soon provide the first significant, complementary enhancement contributions to Alaska's fisheries by the private sector.

This past year I circulated for public review a salmon fishery policy document that has been generally well received for its soundness. In September, I initiated a further and major effort to develop a comprehensive salmon fisheries plan for subsequent review by the Alaska Fisheries Council. Although the plan will not be completed until later in 1976, I am strongly encouraged by the interest already evidenced in its formation. I am confident that the knowledge and technological advances vital to overcoming past deficiencies in the state's managerial function area are close at hand and that the plan will provide both the stimulus and direction necessary to restore the salmon fisheries to acceptably high levels of production in the shortest time possible.



Continued and expansive development throughout Alaska, especially that associated with the Trans-Alaska Pipeline and imminent Outer Continental Shelf leases presented challenges to both fisheries and wildlife managers in 1975. The department played an active supportive role in the development of Alaska's proposals for D-2 lands by providing team leadership as well as initiating and implementing critical programs to develop fish and wildlife data. In addition, coordination, review, and constant surveillance of pipeline activities were conducted to assure a minimum of detrimental impacts on fish and wildlife. Game bioligists frequently assisted in resolving human/ animal conflicts - usually resulting from either intentional or inadvertent feeding of wild animals by pipeline crews.

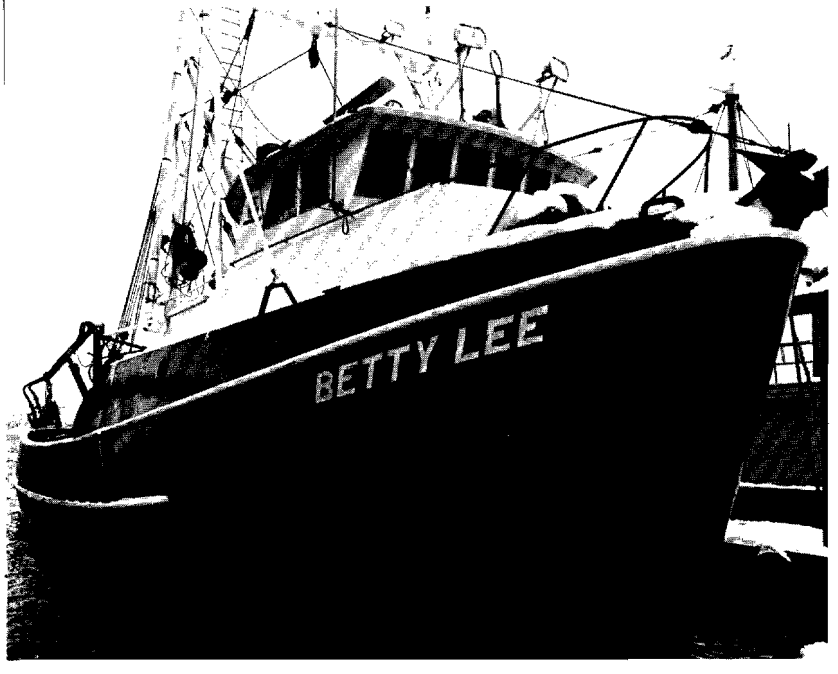
A planned predator control program designed to reverse the downward trend of the moose population in game management unit 20A was stalled to the point of impracticality by an injunction. Although the court subsequently found in favor of the department, the judgment came too late to successfully conduct

the program. A veritable deluge of mail in response to public announcement of the proposed control program, especially from the other states, is testimony to the high interest placed on Alaska's wildlife by the public throughout the United States and Canada.

A significantly more successful program in 1975 was the first Alaskan muskox hunt. Hunters, guides, and staff alike were pleased with the hunt which was conducted smoothly and without incident. This necessary culling of the surplus of Alaska's muskoxen will assure that the carrying capacity of the natural range will not be exceeded and that the herds can continue to prosper.

In closing, I would like to emphasize that Alaska's fish and game resources represent real and vast potential benefits to both Alaskans and non-Alaskans. Sustained realization of these benefits, however, requires both the philosophical support of Alaskans plus the financial commitment essential to staying ahead of inimical changes.

James W. Brooks
Comissioner



Renamed Pandalus.

The Division of Administration serves as business manager for the Department of Fish and Game. Services provided include personnel, payroll, accounting, systems analysis, supply, communications, property, warehousing, office and repair, budget counseling and monitoring as well as administrative guidance at regional offices. The director also has responsibility for operation and maintenance of department-owned vessels.

SERVICES

The Division of Administration continued its trend in improving the quality of services furnished other divisions and departments through streamlining operations. Addition of a position to specialize in contracts, leases and facilities enlarged the scope of services.

The director's office was instrumental in completeing over 200 contracts/leases with institution of new procedures and furnished liaison services regarding acquisition of access land and excess buildings.

In transacting department business, the accounting section issued 12,000 field warrants. Expenditures, excluding payroll, amounted to more than $7 million. Claims were prepared for more than $4 million in federal reimbursements.

The statistics section was decentralized in an effort to provide more responsive services to the resource management divisions.

The personnel section maintained records on an average of 400 permanent and up to 450 temporary employees. In doing so, it processed more than 1,100 appointments and separations and more than 2,500 personnel action forms. In conjunction with the payroll section, retroactive longevity adjustment computations were completed. The payroll section instituted new procedures applicable to the automated leave format.

The supply section, which includes the mailroom, processed more than 110,000 pieces of mail. Inventory records maintained by the property officer cover more than 4,500 items with a value in excess of $3.5 million. Purchasing activity increased as a result of the additional authority extended to the supply officer and the volume of purchase requests submitted to the Department of Administration was reduced.

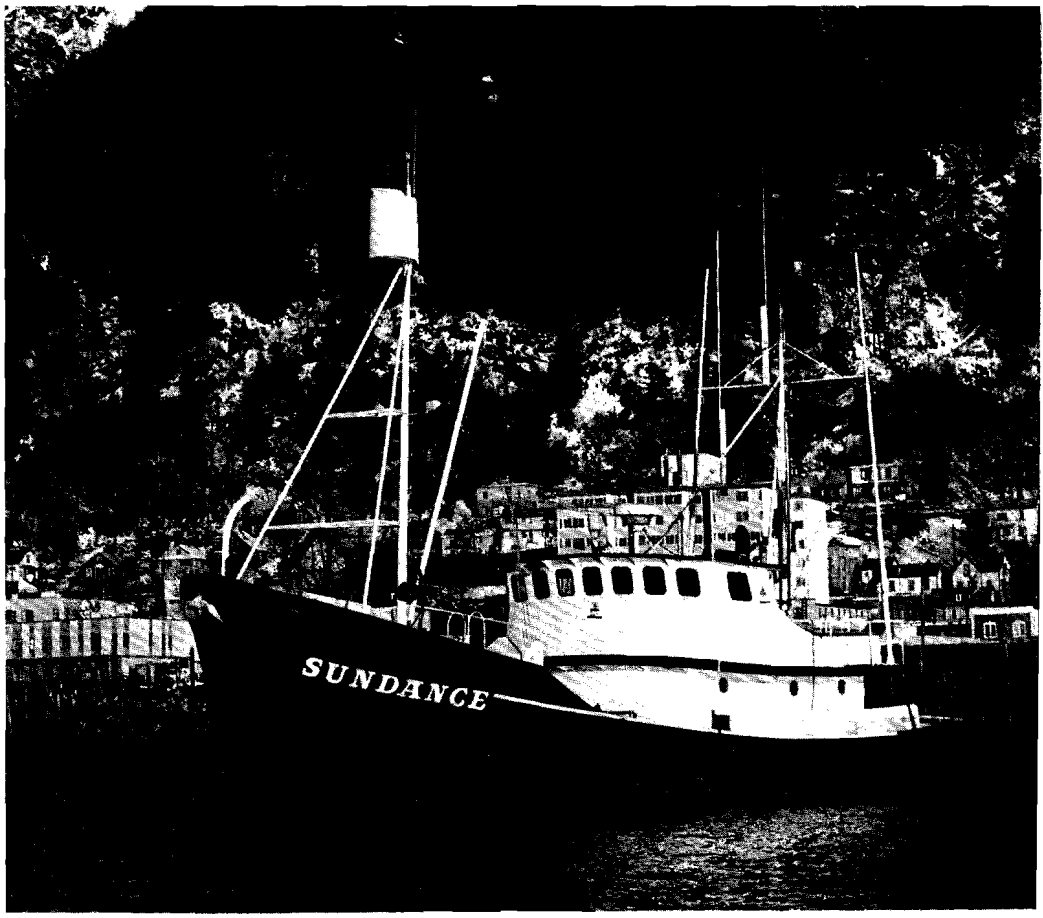
VESSELS

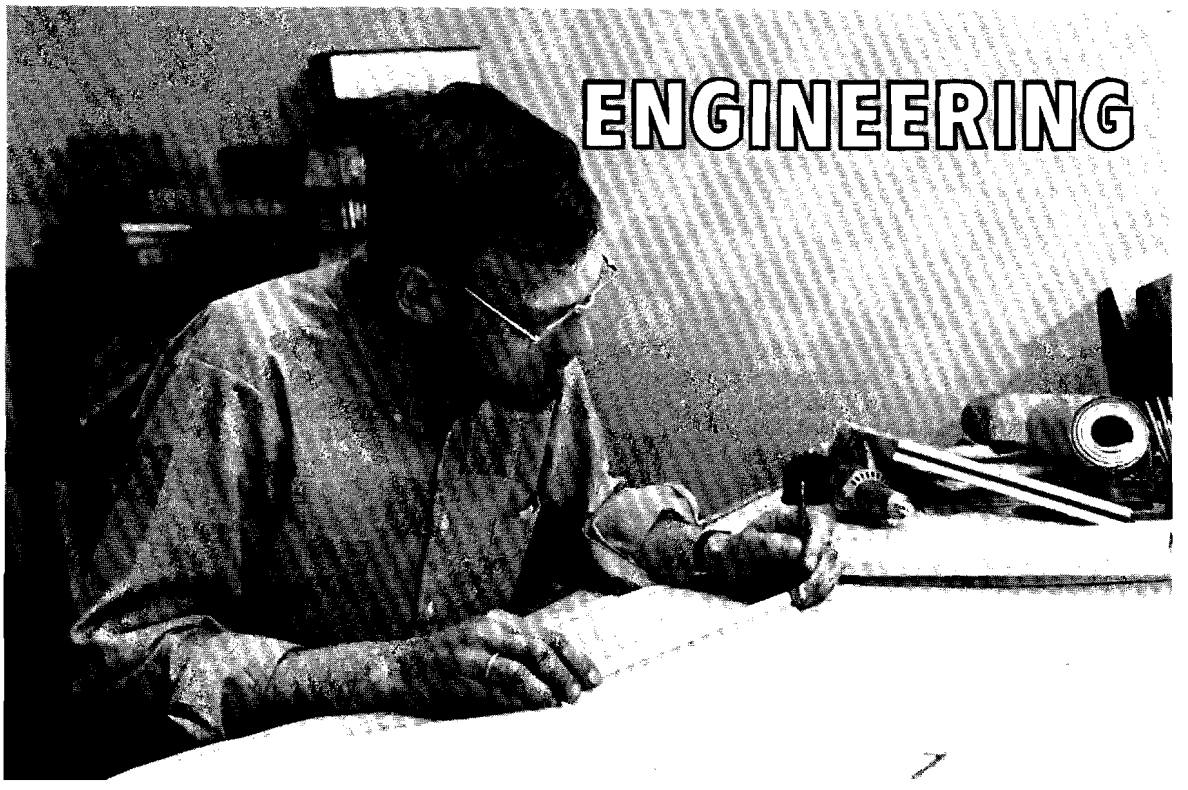
Two vessels, the Sundance and the Pandalus, were added to the fleet in 1975 and will further serve the various divisions in carrying out their programs.

The Sundance is a 70-foot, schooner-rigged, steel-hulled fishing boat with accommodations for 10 men. It is scheduled to replace the Grizzly Bear.

The Pandalus is a 66-foot, steel-hulled crab boat with accommodations for seven men. It will serve the department on Lower Cook Inlet and Kachemak Bay.

Both boats have complete electronic and hydraulic gear and both are powered by 12V71 GM diesel engines.





The engineering section provides qualitative engineering support to all divisions and sections of the department. The duties and responsibilities of the engineering section can be summarized by the following basic functions:

PROJECT STUDY AND EVALUATION

Provide the management divisions with engineering data needed to evaluate the feasibility of developing new or modifying old facilities. Support in this phase consists of on-site field investigations (basic), preparing conceptual plans, preparing preliminary cost estimates and making recommendations as to the economic justification for developing a project.

PROJECT DESIGN

Prepare detailed plans, specifications and cost estimates for projects that are to be constructed.

CONSTRUCTION ADMINISTRATION

Provide supervision, inspection and administration for all projects under construction. The increasing complexity and numbers of projects being developed by the Department of Fish and Game is resulting in heavier emphasis on the contract method of construction. Division force account construction is still being employed on smaller projects.

Major projects included:

CRYSTAL LAKE HATCHERY - PETERSBURG

Ten new rearing ponds were constructed at the Crystal Lake Hatchery in 1975. The accelerated project was designed and constructed during a nine-month period from mid-January through mid-October. The project was designed by Tryck, Nyman & Hayes of Anchorage and Cooper Construction Co. of Anchorage did the construction work. Each concrete pond is approximately 17 feet wide, 75 feet long and has an adjustable depth to 4 feet. It is expected that each pond will be capable of holding 7,000 pounds of fish and rearing options are greatly improved by the use of the separated ponds. Total cost of the project was approximately $700,000.

BIG LAKE SOCKEYE REARING FACILITY

This facility was designed and constructed during a 10-month period from mid-February through mid-December. The project consisted of an incubation building of approximately 4,500 square feet and a utility building of approximately 800 square feet. The project was designed by R & M Engineers of Anchorage and construction was by Jokiel Construction Co., also of Anchorage. This facility is now undergoing operational tests in anticipation of full scale operations starting with

the 1976 fall egg take. Costs to date have approached $440,000. With the addition of incubators and other required equipment the project costs will exceed $500,000.

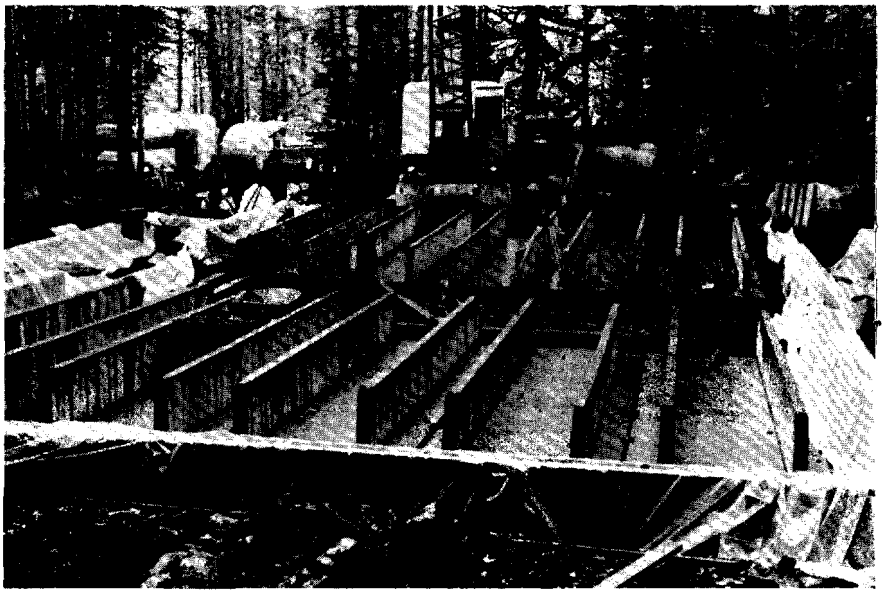
TUTKA LAGOON INCUBATION FACILITY - KACHMAK BAY (SELDOVIA)

This facility is similar in nature to the Big Lake facility except that it is smaller. A single incubation building (2,800 square feet) was designed for self contained operations to facilitate construction at the remote site. Once again the design and construction was accelerated in order to take advantage of a single season and minimize inflation. Tryck, Nyman & Hayes did the design and Rockford Corp. did the construction work. The entire project took approximately 10 months and the costs are nearly identical to those encountered in building the Big Lake facility. Testing is in progress and full scale operations are planned to start in the fall of 1976.

The engineering section provided major input in the development of approximately 50 capital improvement projects in 1975. Following is a regional listing of the most significant projects that the engineering section helped to develop.

Southcentral Region:

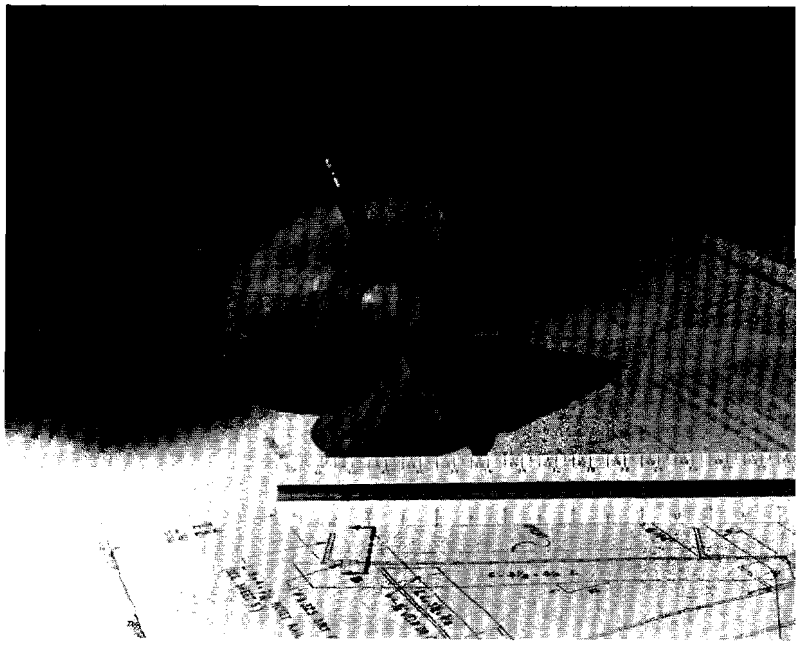
1) Tutka Lagoon Incubation Facility: design/construction/operational
2) Big Lake Incubation Facility: design/construction/operational
3) Humpback Incubation Facility: designed/development delayed
4) Crooked Creek Incubation Facility Modifications: designed/operational
5) Halibut Lagoon Rearing Pen Modifications: designed/operational
6) Packers Lake Fish Control Structure: design/construction/operational
7) Tex Smith Lake Outlet Structure: design/construction/operational
8) Aircraft Mounted Fish Tanks: design/construction/operational
9) Little Kitoe Outlet Repairs: designed/construction/operational
10) Kitoe Bay Hatchery Repairs: designed/construction in '76
11) Lake Rose Tead Channel Diversion: site survey/preliminary cost estimate
12) Frazer Lake Fishway Modifications: design contract initiated
13) Apollo Creek Fishway: design contract initiated
14) Middle Creek Fishway: survey contract initiated



15) Russian River Weir: survey control/preliminary cost estimate
16) Fire Lake Hatchery Improvements: design/construction/operational
17) Ship Creek Hatchery Complex (Elmendorf): design initiated
18) Ship Creek Hatchery Complex (Ft. Richardson): design initiated
19) Tebay Lakes Fishway: preliminary survey/concept/cost estimate
20) Fish Tagging Trailer: designed
21) Bacharof Lake Boat Way: designed
22) McGrath Housing Sewer Treatment: preliminary design/cost estimate
23) Prince William Sound Incubation Facility: preliminary site inspections (8 sites)
24) Alaskan Peninsula Incubation Facility: preliminary site inspections (4 sites)
25) Chignik Weir: preliminary design/cost estimate/construction in '76
26) Sheep Creek access: surveyed trail and prepared drawings
27) Birch Lake Rotating Screens: assisted in acquisition/installation in '76

Southeastern Region:

1) Fish Creek Salt Water Rearing: design/construction/operational in '76
2) Crystal Lake Rearing Ponds: design/construction/operational
3) Chilkoot River Weir: designed/construction in '76
4) Navy Creek Fishway: design/construction/operational
5) Falls Creek Fishway: designed
6) Sitka Incubation Facility Modifications: design/construction/operational
7) Auke Bay Salt Water Pumps: engineering report for N.M.F.S.
8) Starrigavan Creek Weir: design/construction/operational
9) Incubation Site Investigations (preliminary: 8 sites in S.E. Alaska
10) Fishway Site Investigations (preliminary): 6 sites in S.E. Alaska
11) Mendenhall Pond Screen Modifications: design/construction/operational
12) Ketchikan Creek Fishway Modifications: designed
13) Anan Creek Fishway: design initiated
14) Harris Harbor Float Modifications: designed/construction in '76
15) Irish Creek Fishway: site investigation/preliminary plans and cost estimate
16) Beaver Falls Storage Shed: design/construction/operational
17) Portable Crew Shelters: designed
18) Crystal Lake Hatchery Underground Utilities: as-built plans

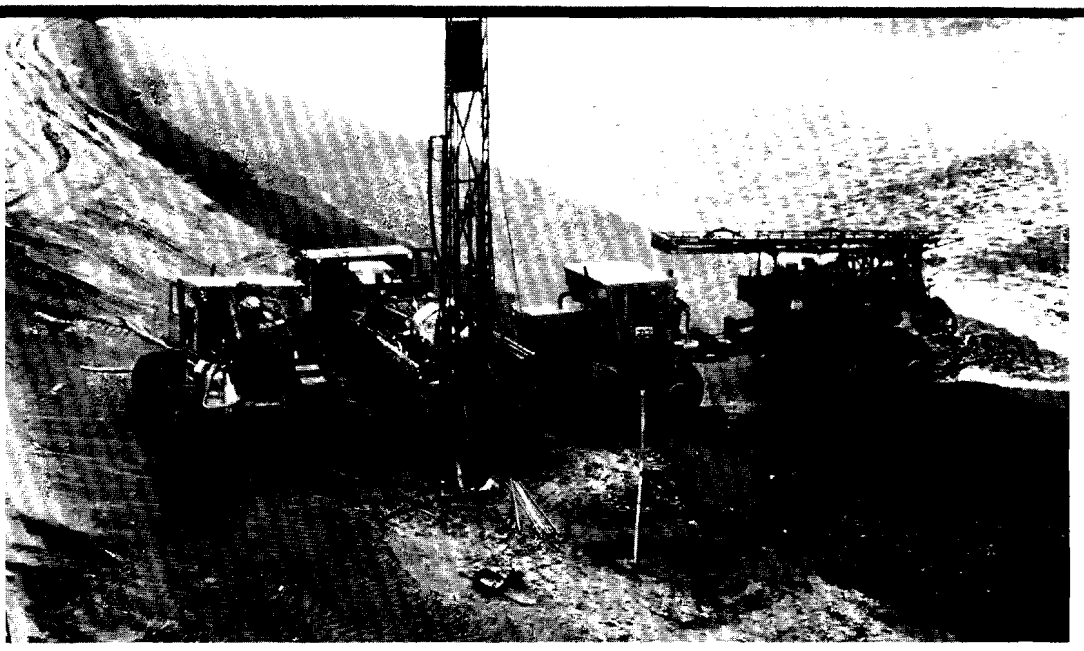


HABITAT

Alaskans need to maintain economic prosperity by development of natural resources while at the same time perpetuating the renewable resources of the state for their use and enjoyment. Unless fish and game populations, habitats and uses are considered in the design or execution of land and water uses or management plans, damage to fish and game values (subsistence, recreation, commercial and support industries) is virtually a certainty. The primary goal of the Habitat Protection Section is to protect, maintain and improve the ecosystems of which fish and wildlife are a part. This is accomplished by participating in planning, regulatory and environmental activities designed to minimize detrimental impacts of land and water uses on aquatic, marine and terrestrial habitats.

Activities of the Habitat Protection Section include (1) review and/or permitting of projects affecting anadromous fish streams and other fish and wildlife habitat; (2) enforcement of permits under No. 1 above; (3) contributing fish and wildlife data and requirements to all levels of statewide, regional and local planning processes; (4) coordinating all departmental responses to the many state and federal agencies which are required to recognize fish and wildlife resources in their operations.

The section contains four programs: (1) Lands and waters protection; (2) land and waters management; (3) marine and coastal habitat management and (4) administration and support of the above function/elements. The Habitat Section fills three of the department's statutory responsibilities (protection of anadromous fish streams, protection of game refuges and delineation and protection of critical habitat areas). In addition, a Pipeline Surveillance Team monitors the construction phase of the Trans-Alaska Pipeline to



insure the future productivity of the renewable resources impacted by the project.

LAND AND WATER PROTECTION

The Habitat Protection Section coordinated the department's efforts to assess possible impacts and to determine the research and rehabilitation measures necessary for implementation of the Corps of Engineers Susitna River hydroelectric power project. This became a rather controversial undertaking since the timetable for preparation of the Corps' Environmental Impact Statement did not allow for sufficient assessment of fish and wildlife impacts.

Another project still awaiting resolution is the Chugach Electric Association's proposal to construct a major transmission line across the Palmer Hay Flats State Game Refuge. Discussions are continuing on the acceptability of alternate routes for the overhead line since the initial proposal does not appear to be compatible with the purpose of the refuge.

Early in the year, the section coordinated the department's review of the applications and support documents submitted to the Federal Power Commission for both the Arctic Gas and El Paso pipeline proposals. Involvement in the Governor's gas pipeline task force was a continuing effort throughout the year. Habitat Section personnel have contributed substantially to the formulation of the state's case before the Federal Power Commission. Habitat Protection staff members are scheduled to appear as witnesses before the Federal Power Commission in 1976.

The Habitat Section was responsible for preparation of the fish and wildlife sections of the state's Beaufort Sea environmental analysis. In addition, section staff participated in formulation of stipulations for operation in the proposed Beaufort Sea oil and gas lease sale area. Permanent installations are discouraged during the exploratory phase of operations. Once reserves are proven, proposals for permanent structures, causeways, pipelines, etc., will be considered.

ENVIRONMENTAL IMPACT

The section reviewed several draft Environmental Impact Statements (DEIS) during the year. The major statements addressed the development of Alaska's natural resources. For example, reviewed were the voluminous DEIS entitled "The Alaska Natural Gas Transportation System," and the DEIS entitled "Proposed Surface Management of Federally Owned Coal Resources and Coal Mining Operating Regulations," both prepared by the Department of the Interior. In addition, the Department of Army DEIS entitled "Offshore Oil and Gas Development, The Alaskan Arctic Coast" and the DEIS prepared by the Environmental Protection Agency titled "The Energy Company of Alaska Topping Plant, North Pole, Alaska" were also reviewed in detail.

Several draft Environmental Impact Statements dealing with both long-term and independent timber sale areas were reviewed. Perhaps the most important was the Tongass Land Use Plan. This 400-plus page document attempted to outline the overall planning for the entire Tongass National Forest. The plan, in its final form, will serve as the basis for most major land management decisions in Southeastern Alaska for the forseeable future. After intensive review by several staff members, this department, as well as various other state agencies, demanded substantial changes in the impact statement, on grounds that it is unacceptable as it stands.

The Ketchikan office (new last year) continued to increase monitoring of local problem areas (primarily illegal filling of tidelands) which had previously gone unreported. The large increase in local problems which have surfaced since establishment of the Ketchikan office indicates a need for a habitat biologist in most larger towns to adequately protect the fish and wildlife habitat.

PROJECT PROPOSALS

The section staff continued to administer Alaska Statutes, Title 16 and interagency agreement responsibilities by reviewing project proposals

and offering comments or issuing authorizations as appropriate. Field review of proposed or active projects was accomplished to the greatest possible extent. Numerous trips to Alaska's oil-rich North Slope were made. Among the most interesting were those which related to present and proposed drilling and seismic activities along the coastal and offshore areas.

GOLD MINING

Monitoring of gold mining was a major activity of the summer months. Much effort was spent as part of an interagency team familiarizing the reactivated gold mining industry with the requirements of state and federal agencies. A total of 42 on-site visits were made to mines in the Fairbanks, 40-mile, Central, Livengood, McGrath and Nome areas.

Later in the year the proposed "Jack Frost 76" military maneuver which involves the Tanana and Yukon River valleys from Galena to Fort Greely was reviewed to insure that fish and game values in the area would be protected.

The following table provides a summary of statutory permit activity and review input to various federal and state agencies for the period Jan. 1, 1975 to Dec. 1, 1975.

Federal		
Corps of Engineers		375
U.S. Geological Survey		5
U.S. Coast Guard		6
Bureau of Land Management		34
Federal E.I.S.		22
Miscellaneous		1
	subtotal	443
State		
ADFG Title 16		111
Department of Natural Resources		
Miscellaneous Land Use Permits		294
Water Use		134
Tideland		100
Timber		19
Right-of-Way		3
Log Salvage		4
Miscellaneous		1
Clearinghouse		222
	subtotal	888
	TOTAL	1331

LAND AND WATER MANAGEMENT

Two new positions were created this year in the Habitat Protection Section. The new planning coordinator acts as a liaison between all divisions of the Department of Fish and Game and the new land use planning section within the Department of Natural Resources. The prime duties of the planning coordinator are to insure that fish and wildlife data and habitat needs are considered in the early stages of land planning-classification and in any future land selections carried out by the state. So far the coordinator has supplied information for the Mt. McKinley Planning Unit and the Cook Inlet land trade. The other main thrust of this position is to delineate fish and wildlife critical habitats statewide, then proceed to protect the areas through appropriate classification. Due to budgetary constraints, the new cooperative management coordinator's position was not filled this year. The prime emphasis of this position will be to establish cooperative management agreements for the native-owned lands as well as other private or government agency controlled lands.

A community project involving the Alaska Waterfowl Assn., the Alaska Chapter of the National Audubon Society and the Municipality of Anchorage was organized and directed by the refuge coordinator. Under his guidance, the group constructed new waterfowl habitat in the form of islands and peninsulas in the West Chester Lagoon Waterfowl Sanctuary. In 1976, these islands will be enhanced with transplanted native bulrushes, sedges and grasses.

MOOSE RANGE

In the early 1950s, there were an estimated 2,500 moose living in and adjacent to Anchorage (Subunit 14c). Accelerated industrial and rural development as well as effective fire suppression programs have eliminated vast areas of this moose habitat, thus reducing the moose population to its present level of approximately 1,000-1,200 animals. Through a cooperative program with the Army's national resource staff at Fort Richardson, more than 200 acres of decadent moose winter range within the primary moose wintering area have been rehabilitated. It is hoped that this project will ultimately create an additional 1,200 acres of critically needed winter range.

Direct assistance was given in developing the legislative bills which resulted in the addition of the Palmer Hay Flats and Goose Bay Wildlife Areas to the state's refuge system in 1975. The Habitat Protection Section's staff is now assisting the Alaska Waterfowl Assn. in developing refuge proposals for four additional important waterfowl areas. These proposals will be submitted during the coming legislative session.

NEW CRITICAL HABITAT

Seven new critical habitat areas have been identified for submission to the 1976 legislative session. They are: *Kamishak Bay/Chinitna Bay*-- supporting a fish and shellfish fishery presently valued in excess of $8 million annually; *Orca Inlet/Copper River Tidelands*---supporting spring and fall migration concentrations of shorebirds and waterfowl exceeding 15 million birds; the *arctic caribou herd calving grounds*---where nearly 40 percent of Alaska's caribou calve and where spring and fall migrations total nearly a quarter of a million caribou; the *Toklat and Lower Delta River salmon spawning grounds*---where the salmon production provides subsistence and commercial fishery harvest values in excess of $1 million annually; *Howe Island*---located adjacent to the Beaufort Sea where the only lesser snow goose nesting colony in the United States is located and *Kruzof Island Clam Beaches*---located in Southeastern Alaska and which provide the people of Sitka their only nearby opportunity for razor clamming.

NATIVE CLAIMS

A major emphasis this year was generated by the Alaska Native Claims Settlement Act. The section solicited comments from department biologists and prepared 469 easement nominations for 110 village selections. In addition, four easement nominations were made on the first two small blocks of regional corporation selections. In all Alaska, a total of about 44 million acres of land will be transferred from public ownership to private ownership under the Alaska Native Claims Settlement Act. Currently there are 203 villages and 12 regional corporations eligible for land selection. Seven villages elected to select their former reserves and this accounts for the nearly four million acres over the 40 million provided for in the Act. Location, purpose, usage and justification were submitted on each easement nomination. Requests were chiefly for linear easements along the coastline, linear easements on streams and rivers and public access across village selected lands to public lands.

Resource valuation papers were prepared on several critical areas on Admirality Island for use by the state in its objections to certain native selections in the Hood Bay, Chiak Bay and Mitchell Bay areas.

The Capital Site Selection Committee's resource staff and consultants gathered a wealth of information from the department via the Habitat Protection Section.

The Arctic Environmental Information and Data Center (AEIDC) was assisted in preparing federal resource profiles.

The master memo of understanding with the Bureau of Land Management (BLM) was revised and updated. BLM is hoping to get into more active land management in the post-ANCSA era.

The Habitat Protection Section continued its involvement in the study of potential wild and scenic rivers in Alaska as proposed by the Bureau of Outdoor Recreation. Section personnel participated in field surveys of the Salmon and Squirrel rivers, both tributaries of the Kobuk River.

The Department of Natural Resources, Division of Lands, initiated its second land use planning effort in the Delta area after implementing its first plan for the Haines-Skagway area. The Habitat Protection Section has been a major contributor to the Delta planning effort. Several meetings were held and the fish and wildlife resource inventory was presented. The Delta area plan will hopefully be completed and implemented during the next calendar year.

The Region III staff also actively participated in the state's plan for lands north of the Yukon River along the North Slope haul road corridor.

Timber harvest and related development again took up the major portion of sectional activities in Southeastern Alaska. Inter-disciplinary Team (IDT) field work, in cooperation with the U. S. Forest Service and other federal and state agencies, continued on the Alaska Lumber and Pulp Company's next 5-year operating period areas in Tenakee Inlet, Port Frederick and on Kuiu Island. In addition to coordination of departmental input into IDT activities, much effort was directed towards bridge site inspections, field surveys of ongoing logging shows and review of long-term tideland lease areas for log storage.

MARINE AND COASTAL HABITAT MANAGEMENT

The activities of the marine and coastal habitat management program over the past year have reflected the transition from the initial investigation centering upon the Kachemak Bay-Lower Cook Inlet area to the rapidly expanding needs for environmental/ecological information along the entire coast of the state as a result of the accelerated federal OCS oil and gas leasing program.

During its evolution over the past year, the program has been conducted within the scope of the original intent of the initial Kachemak Bay program Plan. Projects include:

A. Assembling existing information concerning oil vs. biological (fisheries emphasis) resources.

B. Obtaining through department research cap-

abilities or contract with other agencies data specific to Kachemak Bay and Lower Cook Inlet.

C. Synthesizing the information gained from above to provide the rationale for regulatory and enforcement functions during oil and gas exploration, development and production. The research aspects are specifically designed for application purposes and are not restricted to inventories.

LARVAL TRANSPORT AND BIOLOGY

Main emphasis was placed upon investigation of the transport processes as they affect and/or control the distribution and dispersal of the pelagic phase of the developing crustacean's larvae, and the patterns of settling of the first, post-planktonic juveniles.

Preliminary results of radar-drogue drift measurements provide for the first time net long-term transport information. Such information strongly suggests that residence time of water parcels in the main center of crustacean spawning and larval development in the outer bay is less than the length of time required by the larval to complete their developmental planktonic stages. Present information also strongly suggests that the Kachemak Bay system is an input-output system for larval development and that larvae originating from outside the area in Lower Cook Inlet can become pelagic-benthic settlers in the bay, while larvae initially spawned within Kachemak Bay can settle outside Kachemak Bay. This, then, indicates an intimate association of Kachemak Bay crustacean production with that of the entire Lower Cook Inlet system.

The present tracking program will continue until late fall, 1976, in order to obtain at least one full seasonal set of information.

MACROPHYTE ECOSYSTEM

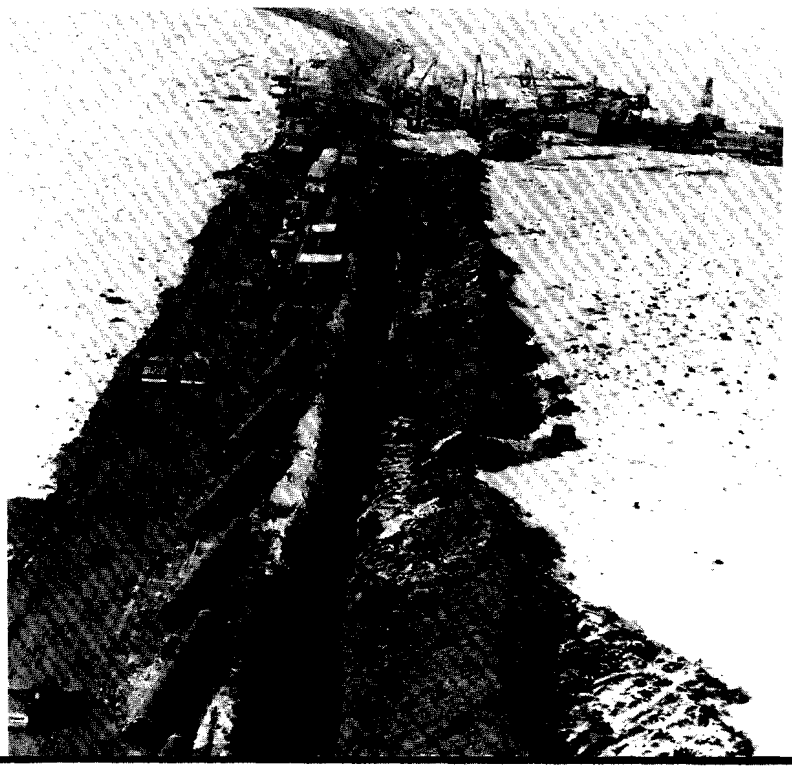
The macrophyte ecosystem (intertidal and subtidal in attached red, brown and green algae) portion of the program was initiated to emphasize the importance of the marine forest to the environmental/ecological makeup of the coastal environment. The macrophytes serve as shelter, substrate, concealment and food for a host of marine forms and are of special importance to early life stages. The macrophytes are particularly sensitive to pollution, but pollutional impacts cannot be assessed until a baseline of species diversity and changes induced by seasonal conditions is established. The present program is attempting to establish proper baseline conditions for a segment of coastal biology usually overlooked in terms of environmental attributes and functions.

CRUSTACEAN POPULATION DYNAMICS BENTHIC ECOLOGY

The crustacean population dynamics segment of the study was initiated to complement the Commercial Fisheries Division's work on stock assesment. The program emphasis is geared to gathering information on the utilization of the bottom of Kachemak Bay and contiguous Cook Inlet by the various species of shrimps and crabs. Primary emphasis was placed upon defining the settling patterns and locations of the first, post-planktonic juveniles. Present data suggests that stony bottoms, with heavy encrustations of bryozoans, hydroids and sponges are a preferred habitat for king crab juveniles.

The marine and coastal habitat protection program has also provided technical assistance to the state's responses regarding federal OCS leasing proposals and impact statements. In addition, the program has done considerable work for the Alaska coastal zone management program in defining the boundaries of the state's coastal zone and its major biological systems.

Logging debris in stream.



HATCHERY SERVICES

The Hatchery Services Section was activated in 1969-70 to consolidate the operations of the department's existing and expanding fish hatchery facilities and to implement the fish hatchery construction bond issue, SLA 1968, Chapter 227. The operational functions were assigned to Hatchery Services in July, 1971. Hatchery Services has three basic goals:

1. Completion of new fish hatchery facilities as funded by the fish hatchery construction statutes.

2. Becoming operational with the new and existing fish hatchery facilities and developing stable sources of salmon and trout eggs for use in the production programs.

3. Fully utilizing the facilities to provide the Sport Fish Division, Commercial Fisheries Division and Fisheries Rehabilitation, Enhancement and Development Division with fish for their expanding needs.

CRYSTAL LAKE

Major new construction of Hatchery Services facilities was close to schedule at year's end. The reinstatement of 10 new high capacity Burrow type circulating raceway rearing ponds at the Crystal Lake Hatchery was completed on schedule last fall. All lots of 1974 brood coho are in the new raceways and both fish and pond systems are doing well. Each pond has a capacity for up to 7,000 pounds of fingerling or smolt production and also provides highly desirable flexibility for carrying different groups of fish to different sizes, as needed by various projects. The recirculating characteristics of the new ponds are particularly adaptable to the biological filtration and recirculating heated water system of the Crystal Lake Hatchery. The construction was accomplished this year with bond issue funding matched in part by Anadromous Fish Act federal aid funds.

SHIP CREEK

The major fish hatchery development at Ship Creek is proceeding on schedule. The project takes full advantage of the heated water available from the Elmendorf Air Force Base steam plant. It is designed to compliment the operational Fire Lake-Fort Richardson hatchery complex. The construction, when completed, will triple the current capacity. The projected 3,500 gpm of new makeup water which was critical to the project proved to be available from a water collection gallery development in Ship Creek. The project involved clearances and mutual arrangements with EPA, BLM and a cooperative agreement with the Air Force. The new facilities were in the final design stage at the end of the year and the engineers anticipate requesting construction bids by spring.

FT. RICHARDSON

The upgrading of the Ft. Richardson rearing pond consists primarily of improving the water supply during critical midwinter low flow periods. The well field development was underway until freeze-up and will be continued next spring. To this date adequate well water has not been developed and this project may be off schedule next year.

FIRE LAKE

A hatchery effluent settling basin was designed and constructed for Fire Lake. This, along with

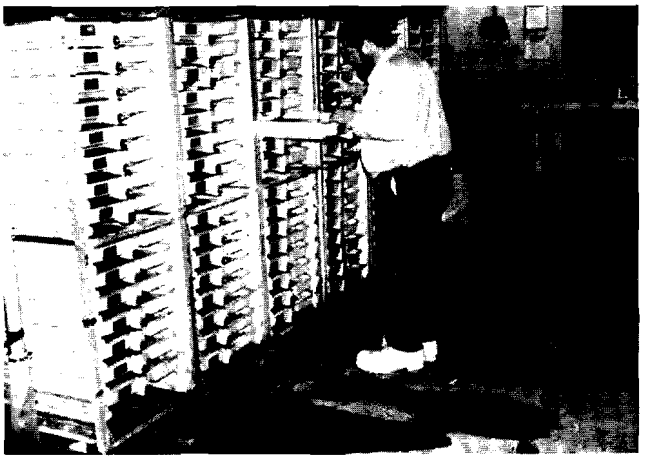
the improved control for stabilizing the Upper Fire Lake water level, should satisfactorily control the water flow for other water users on the small system.

OPERATIONS

Significant operational improvements were made at the Crystal Lake Hatchery during 1975.

The gas embolism problem in sac-fry of last winter has been corrected by increasing the capacity of the warm water supply head tank de-aerator. It has eliminated nitrogen-argon supersaturation in the TWW (treated water, warm) supply so that fry (alevins) may now be reared in water up to 15° C (59°F) with no threat of embolism. The improved elimination of excess gases also corrected the problem of air entrapment beneath the incubator trays, which had required constant attention to prevent mortalities.

Stainless slotted wire screening was installed in the biological filter beds to efficiently contain the poly-bead filter media. The filters were further improved by installation of a permanent electric pumping and manifolding system for draw down and backwash. This has improved cleaning efficiency by 75 per cent. Other refinements included maximum use of oyster shell buffering for reducing acidity. The recirculating operation is now close to the original design concept. It is anticipated that the upgrading will be reflected in improved fish rearing.



Steelhead fingerling benefited from the hatchery's improved water use system and should reach the desirable smolt size by release time in the spring of 1976. King salmon eggs were also received and incubated but coagulated yolk sac (white spot) disease has caused heavy delayed mortality at the alevin stage. Corrective measures to alleviate the disease have not been defined.

The hatchery reared 50,000 rainbow trout fingerling for the U.S. Fish and Wildlife Service to plant in Purple Lake on Annette Island.

Six trips on the Marine Ferry System were made with the 3,000 gallon fish tanker and one with the 800 gallon fish tanker.

The summaries of fish handled are listed in Tables 1, 2 and 3 of the tables section.

The first adult returns of Crystal Lake Hatchery reared coho were realized this fall. Approximately 9,000 adult coho were handled from Crystal Creek and 6,000 were utilized to take 5 million eggs. Approximately 1,600 spawning adults were transplanted to several other streams on Mitkof Island which had depressed coho runs. The balance of 1,400 coho were allowed to spawn naturally. Of the coho handled, 97 were marked fish from the hatchery's May, 1974 release into Crystal Creek. The escapement was about 3.5 percent of the released smolt. An informal census of fishermen conducted by the staff in the Blind River Rapids-

Wrangell Narrows area this summer and fall indicated that 75 per cent of the coho caught there were hatchery released fish.

FIRE LAKE - FT. RICHARDSON

A total of 4,455,400 fish and eggs were shipped from the Fire Lake-Ft. Richardson-Elmendorf hatchery complex in 1975. Fish were planted into 111 separate lakes and two streams, and transfers were made to the Crystal Lake Hatchery at Petersburg and saltwater rearing pens at Halibut Cove.

One hundred individual trips, 814 man-hours, and 12,000 highway vehicle miles were required for fish distribution. An additional 12 trips using a Department of Public Safety Grumman Goose were required. Seven shipments via commercial aircraft and four via military aircraft were made.

The state fisheries pathologist spent considerable effort during the spring on the chronic gill disease problem at Fire Lake. Significant progress was made in controlling the disease with programmed Diquat treatments. Roccal and Diquat treatments were also successful in checking less serious bacterial outbreaks which occurred at both Ft. Richardson and Elmendorf at irregular times during the year. A low-grade septicemia was diagnosed in one-year-old Swanson River rainbows at Elmendorf and they are being treated with medicated feed.

Development of the department's own rainbow trout broodstock is continuing and has become more urgent, with the almost total reduction in eggs imported from outside sources. This year saw the first eggs taken from Alaskan-reared rainbow trout broodstock although the final eggs were not of useable quality. The eggs were small, fertility was low and there were numerous deformed fry. No reason for the low quality was substantiated but diet deficiencies appeared the most likely cause and the diet formulation was changed. The general physical condition and egg development in the same lot of fish, now 3-year-olds, is much improve ed. Some early eggs have been taken and the quality appears satisfactory although it is too early to accurately access viability.

OTHER FACILITIES

Eggs for broodstock development were taken from native rainbow at Talarick Creek and Swanson River for the second consecutive year. The egg taking success was not high, but adequate eggs for broodstock were obtained.

Two prototype floating raceways installed at Elmendorf during 1974 to hold adult rainbows are working well and six additional raceways were constructed and installed by hatchery personnel during the year. More are planned. The ponds have made possible the development of the rainbow broodstock program in advance of permanent hatchery construction at Elmendorf.

The use of the Department of Public Safety's Grumman Goose for fish transportation was enhanced through use of special tanks holding 150 gallons of water. Nearly one million coho and rainbow fingerlings were transported in the new tanks and adult sheefish for spawn-taking experiments were also transported from the Yukon River to the Fire Lake Hatchery.

The Kitoi Bay Hatchery continued its support of FRED Division projects. About 5.25 million 1975 brood pink salmon eggs were obtained from Big Kitoi Creek and Seal Creek. Another 300,000 1975 brood red salmon eggs and 25,000 king salmon eggs were also obtained. The egg takes were a joint effort with Hatchery Services, FRED Division and Sport Fish Division.

About 1.25 million of the eyed eggs were planted in Izhut Bay streams adjacent to Kitoe Bay.

The 1974 brood pink salmon rearing resulted in 1.25 million fry released into Big Kitoi Creek plus some held for salt water rearing. These latter incurred vibriosis and did not respond well to the treatments available.

The other stocks of fish at the hatchery had moderate to negligible mortalities after the eyed egg stage.

The capacity for the station was increased to eight gravel and four astro-turf incubators. Three stacks of Heath incubators were also put on the line.

Plans are being formulated to further increase the station's pink salmon incubation capacity prior to the next egg take.

Badly needed maintenance was accelerated with the installation of a 30 kw generator and the upgrading of the fuel lines and day tanks. The major upgrading of the heating system and other components was designed by the Engineering Section and was contracted and underway by the end of the year.

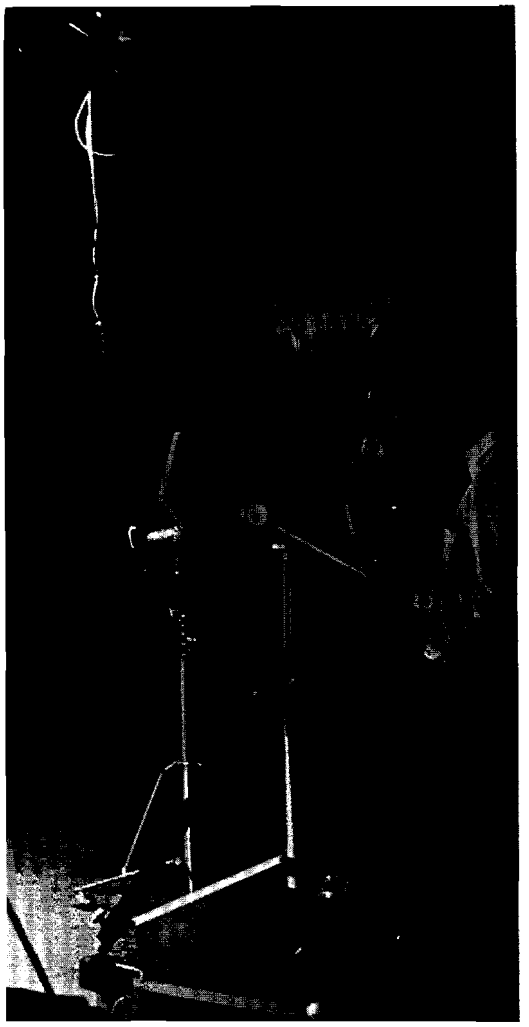
INFORMATION-EDUCATION

The Information-Education Section is responsible for informing the public about the fish and wildlife resources of Alaska and about the department's research and management activities.

This is accomplished through information and education programs which include news releases, films, a weekly television program, radio programs, a magazine, pamphlet , exhibits and personal appearances. The section also answers nearly 5,000 letters per year from persons seeking information about Alaska's fish and game.

During 1975, the section wrote and distributed nearly 200 news releases, produced 52 weekly television programs and 230 radio programs and released 250 weekly newspaper columns.

Press run of the department's bimonthly magazine "Fish Tales-Game Trails" produced by the Information-Education Section reached 10,000, up 2,000 from the previous year.



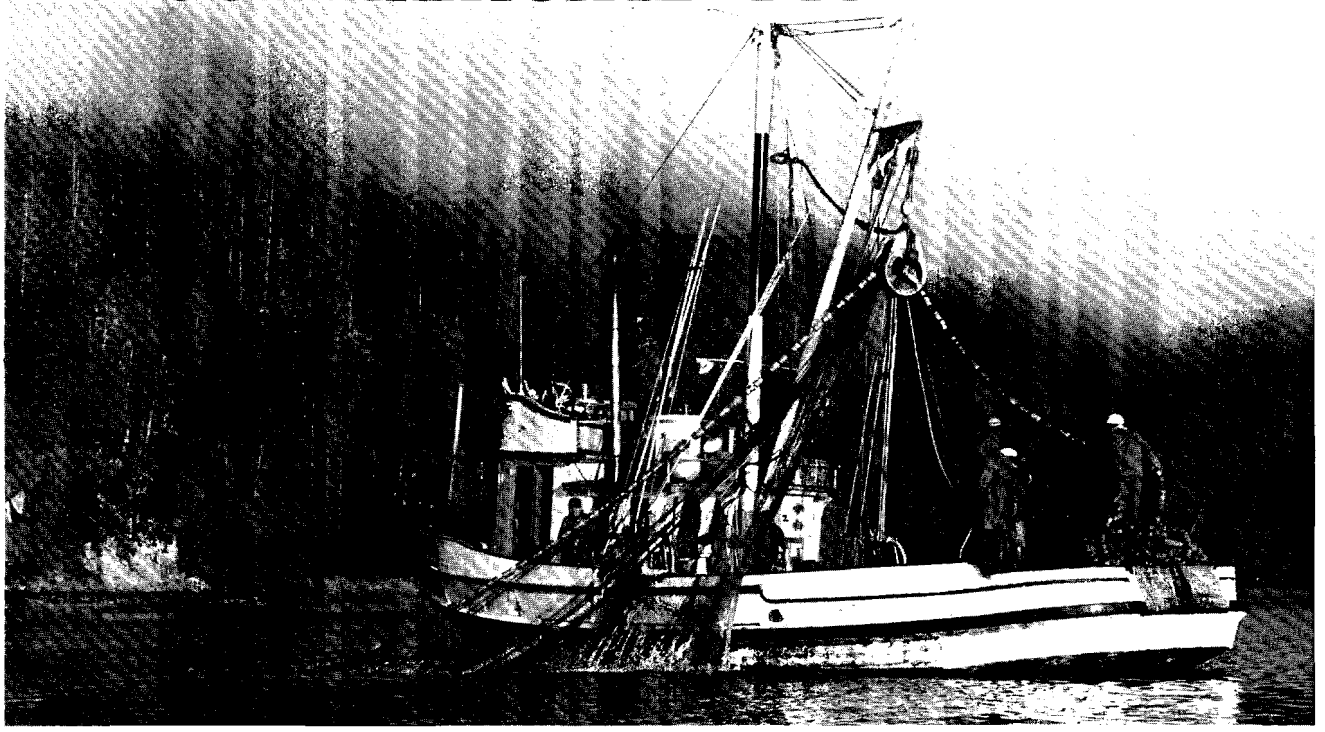
"Clam Digging on Cook Inlet," a film produced in cooperation with the Sport Fish Division, won third prize in the annual competition sponsored by the American Association for Conservation Information.

As the result of a bill passed by the 1975 Legislature, format of the annual photo contest was changed and administration of the new contest required considerably more time and effort from section personnel.

The section assists in the preparation of reports and publications for the various department divisions. It also aids in special programs and exhibits which are designed to bring about a better public understanding and awareness of the department's role in managing Alaska's fish and game.

Major exhibits included a display at Fish Expo '75 prepared in cooperation with the Department of Economic Development.

COMMERCIAL FISHERIES



The Division of Commercial Fisheries is charged with managing, extending and conducting research on all species of finfish and shellfish harvested commercially or for subsistence purposes in Alaska, with the exception of halibut, which are regulated by the International Halibut Commission.

With an operating budget of $4.48 million in 1974-75, the Commercial Fisheries Division was responsible for managing commercial fisheries that provided $144.8 million to fishermen and were worth $254.36 million at the first wholesale level. On a national basis, Alaska's seafood harvest is the most valuable of all the states.

SOUTHEASTERN ALASKA

SALMON HARVEST

The Southeastern Alaska region experienced generally poor returns of all species of Pacific salmon in 1975. A very restrictive management program was put into effect and all forms of salmon fishing were curtailed. Pink salmon escapement goals were approached or met in much of the southern half of Southeastern Alaska and in areas near Sitka. Extremely depressed pink returns to inside waters of the northern half of Southeastern Alaska resulted in low escapements in this area despite almost total closure of the purse seine fishery. Commercial gillnet and troll gear closures appeared to maintain average escapements of red salmon and coho salmon in most major systems.

Commercial gear levels, especially in the Southeastern and Yakutat salmon gillnet fisheries, dropped because of limited entry. This drop was welcomed by management biologists who were attempting to provide for adequate escapement levels during a poor return.

HERRING

Herring fishing in both the winter food and bait fishery and the spring sac roe fishery generated considerable interest throughout Southeastern Alaska. The 1975 spring roe fishery contributed substantial income to herring fishermen and workers at processing facilities. Limitations to the winter herring market in the fall of 1975 resulted in a shift toward expansion of herring roe fisheries. The Alaska Board of Fisheries established several new herring roe fishing areas for gillnet gear and slightly raised the harvest level for herring taken for roe purposes in Southeastern Alaska.

Department herring assessment capabilities were expanded with the addition of the M.V. Sundance to the department fleet. Three vessels are presently outfitted for herring assessment work in Southeastern Alaska. In 1975, these vessels were fitted with side scanning sonar gear which will reduce the time spent in locating herring schools for assessment work. A cooperative agreement between the Department of Fish and Game and the National Marine Fisheries Service has involved N.M.F.S. vessels, personnel and gear in gathering herring information.

RESEARCH

Southeastern region research personnel continue their efforts to provide management biologists with better data. New developments include the design and contracting for construction of a large red salmon counting weir at Chilkoot Lake near Haines and plans for a coho salmon migration, timing and harvest rate study. The coho study will involve tagging smolts in major rearing areas in 1976 and 1977 and recovery of these tags in various fisheries as the fish return as adults in 1978 and 1979.

Biologists involved with pink salmon forecasting are analyzing years of back data through use of new computer programs in an attempt to increase forecast accuracy.

LAND USE

Most of the Southeastern region Commercial Fisheries Division staff become involved in land use activities affecting fisheries resources. The two biologists of the Land Use Project work full time on land use planning and stream inventory work. Some progress is being made in establishing a recognition of the importance of fisheries resources among agencies and individuals involved in conflicting uses of watersheds in Southeastern Alaska. More progress is needed, however, to maintain the productive potential for fish in areas where major land use activities such as logging are occurring.

SUPPLEMENTAL PRODUCTION

Development of techniques to supplement natural fry production through the use of incubators holds great promise as an additional tool for fisheries managers. Rehabilitation of severely depressed natural stocks of pink and chum salmon should be possible using incubators to greatly increase the egg to fry survival of eggs taken from a depleted stock.

CENTRAL ALASKA

SALMON HARVEST (PRELIMINARY FIGURES)

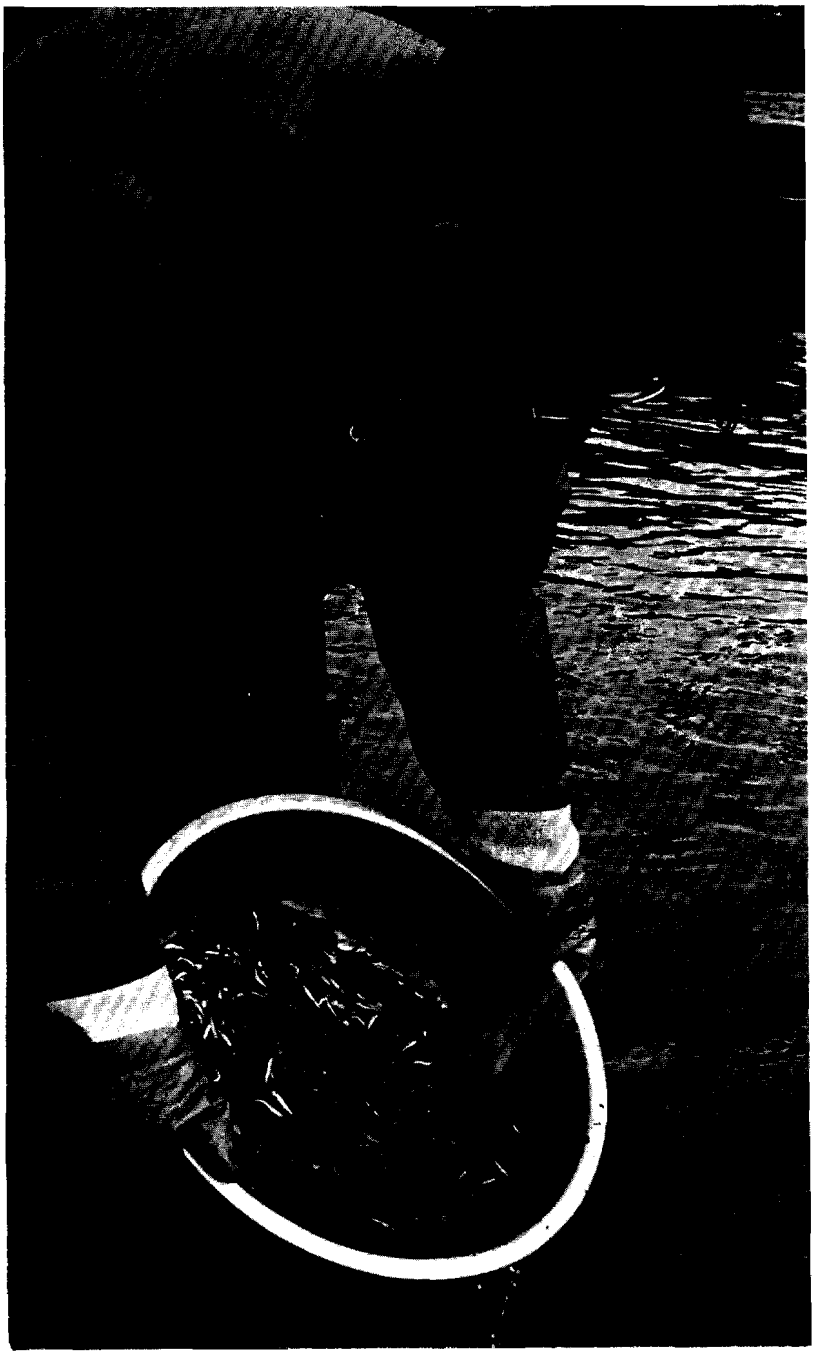
BRISTOL BAY

The 1975 Bristol Bay sockeye return was managed to obtain escapement goals in all systems. This management philosophy was based on a preseason forecast that indicated the total return would be less than the preseason escapement goal of 17.5 million. The total inshore return totaled 24.2 million fish compared to the preseason forecast of 12.0 million. The commercial catch of 4.8 million sockeye exceeded the estimated catch of 2.4 million by 199 percent. Escapement goals were obtained in all major systems but were exceeded by a wide margin in the Wood and Nuyakuk rivers in the Nushagak district and in the Naknek and Egegik rivers.

COOK INLET

The 1975 salmon harvest in the gillnet districts north of the latitude of Anchor point in Cook Inlet was one of the better odd-year catches in recent years. A total of 2.2 million salmon all species were caught. The odd-year average since 1960 is 1.6 million salmon. Coho, pinks and chums were all above the 10-year average for odd-years. The pink and chum salmon catches were twice as great as the odd-year average. Escapement of sockeye in the Kenai River was fair, poor in the Kasilof River, good in Fish Creek and fair to good in the rest of the area. Pink salmon escapements were very good in the Northern district and extremely poor in the Central district. Field observations indicate that escapements for coho and chum were good.

Lower Cook Inlet, south of the latitude of Anchor Point experienced one of the largest pink salmon returns since 1962. In 1975, 1.067 million pink



salmon were harvested with the majority of the catch taken in the Southern district. All escapement goals were reached in the Southern district. However, escapements were below the desired goals in the Outer and Kamishak fishing districts.

PRINCE WILLIAM SOUND

In Prince William Sound the early and middle segments of the pink salmon return were excellent; however, the late segment of the run was weaker. An adjusted preseason forecast indicated an upper range of 5.7 million pink salmon would return in 1975. The actual return was slightly higher (6.1 million pinks) and of these, 4.5 million were harvested and 1.6 million went for escapement. Pink salmon escapements were within the desired escapement goals for the Eastern, Northwestern, Coghill, Montague and Southeastern management districts. However, they were below minimum escapement goals in the Northern and Southwestern districts. Chum salmon runs, as expected from the preseason forecast, were poor. Chum salmon taken incidental to the pink salmon catch amounted to 100,000 and spawning escapements were estimated at 47,000. The preseason forecast had indicated a range of return from 137,000 to 293,000 salmon. Escapements for chum salmon were below desired levels in all management districts. The Coghill-Unakwik fishing districts produced the largest sockeye harvest in the past 10 years (159,400). Escapement counts and aerial surveys indicate good sockeye escapements for the Coghill district. The Copper River district fishery produced the second lowest sockeye catch recorded in the past 15 years (336,000). The Bering River sockeye harvest was approximately half of the last 14 years average. Escapements were also below recent averages.

HERRING

The Cook Inlet herring catch of 4,809 tons was the second largest catch since 1970. In 1975, 44 seine vessels fished compared to 18 vessels in 1970. The catch distribution by district was quite different from past years. In 1975, 99 per cent of the catch came from the Kamishak district. In the past six years the majority of the catch has been taken in the Southern district and the Resurrection Bay area. However, no harvest was taken in Resurrection Bay this year and only 24 tons were landed from the Southern district. The bulk of the catch, as in the past, was utilized for sac roe.

Approximately 6,064 tons of herring were landed in Prince William Sound in 1975. Of this total catch, 193 tons were utilized for bait and 5,871 tons for sac roe. In addition, 917,000 pounds of roe on kelp were harvested. Effort was higher than in more recent years with 76 vessels making landings. In summary, 16 days of constant monitoring by the staff was required. The harvest was made in an orderly manner. Buyers had tenders available in fishing areas prior to the season so no

wastage was apparent. The harvest quota of 5,000 tons for Prince William Sound was only slightly exceeded, and roe quality and per cent recovery were the highest recorded for the area.

SHELLFISH

The 1975 king crab catch of 2.9 million pounds for Cook Inlet was well below the past 5-year average (4.3 million pounds). This low catch is attributed primarily to a fishermen's strike early in the season. Crab normally available to fishermen in the Kachemak Bay area migrated out of the area before the price dispute was settled. The trawl shrimp fishery remained stable with 4.6 million pounds being landed, which is slightly below the 1974 catch (5.7 million pounds). This decrease is attributed to poor fishing weather rather than to a decline in stock abundance. Harvests of pot caught shrimp were well below the catch of 1974 (677,800) because of poor local markets. The 1975 catch amounted to approximately 208,000 pounds. Tanner crab landings totaled 4.9 million pounds in 1975 compared to 7.6 million pounds landed in 1974. Poor markets were the reason for this decline.

In Prince William Sound the tanner crab catch was approximately 5 million pounds in 1975 compared to 9.6 million pounds in 1974. The decline in catch was attributed to poor markets and poor fishing weather in late 1975. Dungeness crab landings in 1975 amounted to 818,000 pounds, a little over the recent five-year average.

COOK INLET RESEARCH

Several notable advances were made in sockeye salmon research in the Cook Inlet area during 1975 and included analyses of genetic variance of sockeye salmon, successful testing of a new sonar counter and purchase of a new 68-foot research vessel.

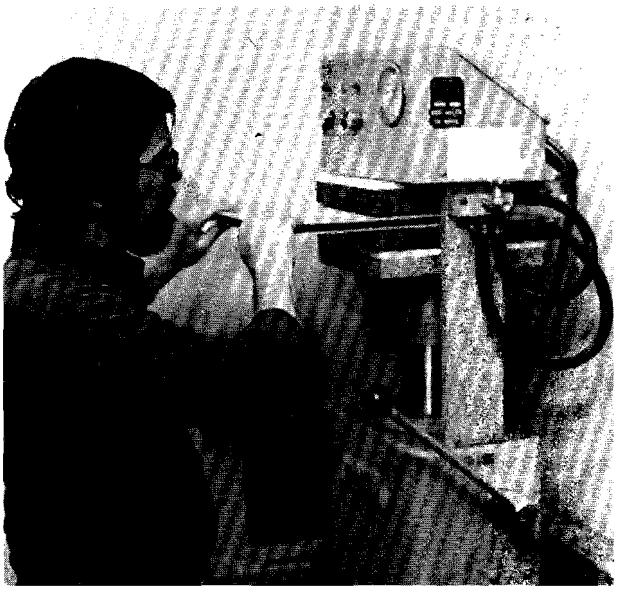
Biochemical genetic variance of 12 distinct component stocks of the fishery were categorized for the first time. Fish samples taken from mature salmon were analyzed by starch-gel electrophoresis techniques. Preliminary results suggest that distinct breeding populations may be identifiable in mixed commercial catches. Knowledge of the genetic characteristics may allow the department to:

(1) Apportion the catch by major and possibly minor breeding populations.
(2) Determine the distribution and timing of these populations
(3) Determine optimum regulatory procedures
(4) Devise additional escapement indices
(5) Optimize escapements
(6) Forecast the return to various systems. Electorphoresis also may be usable for identifying breeding populations of other species.

The prototype of a new sonar adult salmon counter was successfully tested in the Kenai River. The new independent system made it feasible for the first time to instantaneously gauge the accuracy of the conventional salmon sonar array. A high level of correlation was determined to exist between the old and the new counters.

The 68-foot research vessel purchased for the Cook Inlet area in 1975 will be used for mid-inlet test fishing shellfish research and habitat studies. Test fishing will hopefully provide the fisheries manager with early indications of run strength. Research continued in Cook Inlet on a number of salmon lakes to determine the optimum escapement levels and the ability to produce additional salmon for Cook Inlet. A number of nursery lakes and stream rearing areas were townetted and studied in 1975 to determine the abundance, distribution and size of juvenile sockeye salmon and of competitor species. An appraisal of salmon utilization of the Susitna River below the proposed Corp of Engineers damsite at Devil Canyon continued during 1975. In addition, considerable time and effort was related to offshore oil and gas lease projects, pipelines and offshore fisheries planning.

Shellfish studies continued on shrimp and dungeness, tanner and king crab. Index pot fishing for king and tanner crab has provided some indications of the strength of the year classes within the harvestable crab population. Tagged crab recoveries during the fisheries of 1974 and 1975 indicated that reasonably high fishing mortalities are encountered in the Kachemak Bay area. A total of 45 per cent of the tagged crabs were recaptured in the commercial fishery. Tag return information has also provided further information on migrational patterns of king crabs.



Shrimp studies are aimed at obtaining an annual estimate of stock abundance through test fishing in the Kachemak Bay area, comparing size and age composition of the shrimp populations to historic data and monitoring the strength of year classes comprising the major pandalid shrimp species harvested in tye bay. In addition, the monitoring of the commercial fishery for CPUE and species composition in both the pot fishery and trawl fishery is conducted.

Dungeness crab fishery studies are conducted to monitor catch rates and sample the harvest for size frequency of the catch. Limited tagging is conducted to provide estimates of fishing mortality, migrational patterns and yearly growth.

BRISTOL BAY RESEARCH

The lakes and rivers of Bristol Bay provide the essential spawning freshwater rearing habitat for Alaska's most important runs of sockeye salmon. During some years the outmigration of immature salmon from the important Kvichak River system can exceed several hundred million smolt.

But many smolt die during their transition into the saltwater phase of their life cycle and contributing to this loss are the beluga whales that frequent the shallow intertidal areas of the mouths of the major rivers to feed on fish migrating in and out of the bay.

The magnitude of beluga predation on salmon has not been clearly documented but it is believed that during years of low outmigration smolt losses may be significant. In 1974, a joint Commercial Fisheries/Game Division program tested a pilot beluga repelling sound system in the Kvichak and Nushagak Rivers. Visual observations of the beluga whales movement patterns while the equipment was in operation indicated the system was effective in repelling the whales away from the mouth of the rivers. The basic unit consists simply of a tape player, tapes recorded with killer whale sounds, an amplifier, an underwater loudspeaker and several hundred feet of cable to permit operation of the gear from a remote point on the river.

Eight new and refined units were purchased for use in 1975. Improvements in this gear include more powerful output, more voltage drain and the addition of an automatic switch that turns the unit on and off to conform with the tidal patterns.

Beginning in the spring of 1975, a multifaceted research program was initiated throughout the Wood River system to investigate the feasibility of rehabilitating or enhancing the sockeye salmon run to that system.

Investigation into the possibility of producing healthier sockeye salmon smolt by reduction of the parasite *Triaenophorus crassus* was initiated by the University of Washington and Alaska Department of Fish and Game. The incidence of this parasite may be reduced by management of another species, northern pike, which occurs in the parasite's life cycle.

Sockeye salmon smolt emigration was monitored by the Department of Fish and Game with a Bendix smolt counter located on the Wood River. Baseline smolt data are required to assess the effects of the other projects designed to increase smolt production or produce healthier smolt. Project activities included determining emigration timing and lake origin of smolt, collecting age-weight-length data and monitoring the incidence of the parasite *T. crassus*. .

Arctic char have long been known to prey heavily upon salmon smolt in areas where smolt concentrate during their emigration from lakes to the sea. A Sport Fish Division crew was located at the mouth of the Agulowak River from June through the end of September and measured, tagged and released about 3,200 char. These efforts will provide a population estimate and movement pattern information. Additionally, sport fishing effort in this area was documented and some stomach samples were taken from sport caught fish.

Char-related activities by Commercial Fisheries Division personnel involved holding char in floating pens, attempts to inhibit feeding through hydroacoustic means, stomach analysis, tag and release studies to determine movement, growth and population levels and preliminary digestion rate studies. Additional winter and early spring samples will be obtained.

Research efforts continued in 1975 to evaluate the rehabilitation and/or enhancement opportunities that may exist in the Becharof and Ugashik lake systems. The work conducted included: early spring beach seining operations to assess the distribution and relative abundance of sockeye salmon fry and their associated utilization of available nursery habitat, ground and aerial surveys of adult spawning populations and fall townetting to determine the distribution of juvenile sockeye salmon along with age and growth information. Winter work was also conducted to monitor the temperature of several primary spawning streams in both lake systems.

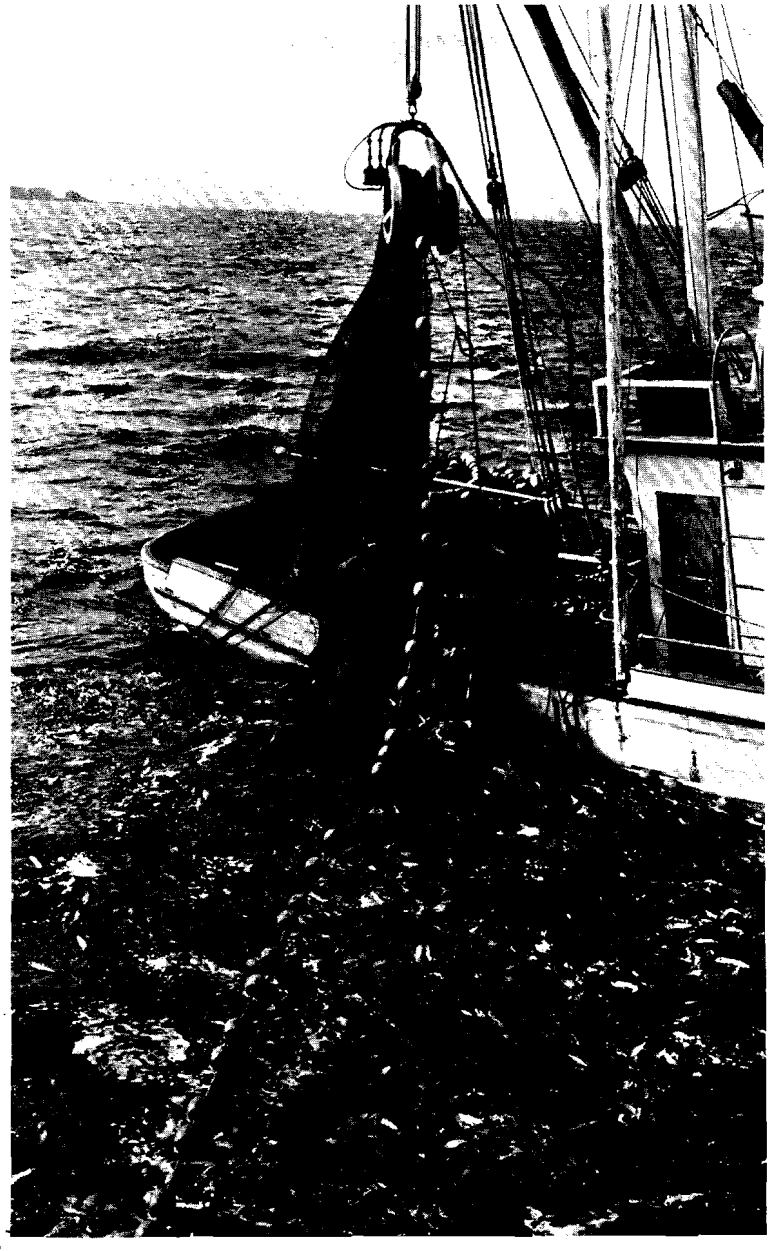
WESTWARD REGION

SHELLFISH FISHERIES

Major shellfish fisheries exist throughout the region. The management of these fisheries requires

that biologists and technicians be stationed at the major processing ports to monitor the catches, collect biological information, collect catch and effort data, conduct logbook and captain interview programs, explain department policy and regulations and recover tagged specimens. Biologists spend considerable time accompanying commercial vessels during the fishing operations to become intimately familiar with the fisheries and to gather information not obtainable at the dock, such as incidental catches of non-target species, abundance of sub-legal size specimens, etc. Permanent shore-based processing facilities are located at various places from Kodiak to Adak and mobile, floating processors operated in many locations during the fishing seasons.

Research is conducted on the more important shellfish species. Annual studies were continued to index the abundance of king and tanner crabs by fishing crab pots with standard methods. Crab tagging and recovery and logbook programs were continued to determine distribution, movements, growth and fishing mortality of major stocks and to refine catch-per-unit-effort measurements. Trawl surveys were conducted periodically to determine abundance of major shrimp stocks and a logbook program was expanded. Studies of various aspects of the life history of king crab, tanner crab, shrimp and razor clams were intensified.



SHELLFISH HARVEST

Preliminary data show that fishermen caught an estimated 226.3 million pounds of shellfish in the Westward Region during 1975. This compared with 235.3 and 239.7 million pounds for 1973 and 1974 respectively. The main contributing factors to the reduction of harvest for 1975 were poor market conditions, price disputes and reduction of population abundance levels of king crab in the South Peninsula and Adak areas.

SHRIMP

The 1975 shrimp harvest for the region was almost 93 million pounds, which represented a decrease in production of approximately 10 million pounds. The major factors in the reduced harvest were market conditions which affected full utilization of westward stocks and an allocation of shrimp harvest levels for certain Kodiak districts to provide for a January and February harvest during the end of the 1975-76 shrimp season.

KING CRAB

The regional king crab harvest exceeded the 1974 level by approximately 4 million pounds. The reduction of harvest in the South Peninsula and Adak areas was compensated by the largest domestic harvest of king crab ever taken from the Bering Sea. The Adak area again depicted an unavailability

of crab similar to 1974. The South Peninsula area generally indicated a reduced population of crab stocks. Price disputes delayed the initial fishing efforts in the Kodiak, South Peninsula and Bering Sea areas.

TANNER CRAB

A long price dispute in the Kodiak area was mainly responsible for a reduced tanner crab harvest.

DUNGENESS CRAB

The dungeness crab catch was entirely from the Kodiak area and represented a commercial harvest similar to 1974. Age classes contributing to the commercial fishery continue to have a low abundance of crabs, although certain small geographic areas did indicate an increasing population.

SCALLOP FISHERY

The scallop resource of the region represents a minor fishery. The live weight harvest increased approximately 900,000 pounds over 1974.

RAZOR CLAMS

The razor clam fishery centers around Swikshak Beach near Cape Douglas. Above normal amounts of "red tide" conditions coupled with higher levels of P.S.P., resulted in closure of the beaches by the state to the taking of clams for human consumption. This factor contributed to some reduction of harvest, although most of the harvest has been utilized for crab bait.

SHRIMP RESEARCH

Studies of catch-per-unit-effort (CPUE) from logbooks, size and sex composition of commercial catches and assessment of pandalid shrimp stocks in the Kodiak, Chignik and Alaska Peninsula areas were continued. Whereas overall unstandardized CPUE rates in the Kodiak area have remained fairly constant during the last six seasons, there was reason to suspect that increased gear efficiency may have masked changes in stock abundance. Therefore, standardization of these data was essential. The analysis of standardized data indicated some difference in relative year class strengths from those based on percentage year class composition. Certain alterations were made in the stock assessment survey strategy. These alterations were designed to increase accuracy, efficiency and reliability of results.

Analysis of past survey data by various statistical techniques suggested that significant differences do exist among surveys and lend more credibility to stock abundance surveys as a valid management tool. An initial shrimp stock abundance survey was conducted in the Chignik Bay and Mitrofania Island areas utilizing the same strategy as in Kodiak. This survey was quite successful in terms of establishing an initial abundance index as well as delineating areas of shrimp concentration.

KING AND TANNER CRAB RESEARCH

During 1975, biologists spent 156.5 days at sea studying the king and tanner crab populations of the Alaskan continental shelf from Kodiak Island to Atka Island. Four Alaska commercial king crab vessels were chartered for this project. Fifteen incidentally captured species were also studied with codfish, halibut and octopus having the greatest commercial potential. The primary objective is to collect biological data vital to scientific fishery management.

Biologists tagged and liberated 8,300 king crabs and 1,800 tanner crabs with subsequent recoveries by commercial fishermen during the 1975 fishing season. The tag recovery information allows managers to monitor the fishing mortality and close areas to fishing when the catch approaches the optimal, thus preventing overexploitation and insuring continuous healthy annual yields.

In addition to the population research, a growth-per-molt study of tanner crabs of both sexes, immatures and adults, was conducted and logbooks were collected from approximately 40 per cent of the commercial king and tanner crab fishermen in the Kodiak and South Peninsula areas.

SALMON FISHERIES

The salmon fisheries are managed from headquarters at Kodiak, Chignik, Sand Point and Cold Bay with forecasts of expected returns used to formulate management plans. Aerial and foot

surveys and counting towers and weirs were used to supply escapement information and catch information was received from processors and tenders by radio and mail. Biologists and technicians stationed at various ports obtained biological data from the catches. The fisheries were regulated by the promulgation of emergency orders supplementing previously established regulations.

SALMON HARVEST

1975 WESTWARD REGION
SALMON HARVEST (thousands of fish)

AREA	KINGS	REDS	COHOS	PINKS	CHUMS	TOTAL
Kodiak	0.1	138.5	23.8	2,947.3	84.8	3,194.5
Chignik	0.5	400.2	53.3	66.2	25.2	545.4
Peninsula-Aleutians	2.2	500.4	28.2	61.6	141.8	734.2
TOTAL	2.8	1,039.1	105.3	3,075.1	251.8	4,474.1

PINK SALMON

Pink salmon are the major commercial species within the region and the normal catch has been approximately 10 million annually during the past 10 years. The Chignik and Peninsula areas continued to be hampered by the low escapement levels of the parent year which was primarily linked with the poor survival condition of the 1970-71 and 1971-72 escapements.

The Kodiak harvest was similar in magnitude to the 1974 return. Good escapements were obtained in the Kodiak area which should return the run to averagelevels for the 1977 season. The upward trend of pink salmon returns is expected to continue with an above average return for the 1976 season.

REVIEW OF THE 1975 SEASON

ARCTIC-YUKON-KUSKOKWIM

SALMON HARVEST

The 1975 commercial salmon harvest of 2.2 million fish was the second largest ever recorded, exceeded only by the previous high catch of 2.4 million fish in 1974. A record harvest of 1.98 million chums was recorded in 1975. Harvests of sockeye (18,000) and coho salmon (121,000) exceeded the 1960-1974 average while pink (33,000) and king salmon (93,000) catches were below average. The 1975 king salmon catch was the lowest since statehood.

Chum salmon accounted for 88 per cent of the A-Y-K harvest. Record commercial catches were made in the Yukon (987,000), Kuskokwim (225,000) and Norton Sound (216,000) districts. The Kotzebue district harvest of 551,000 chums was second only to the record 1974 catch of 634,000 fish. In the Yukon district the record chum catch was attributed to an exceptionally large run of summer chums - - perhaps one of the largest in recent years. Nearly 2 million summer chums were documented during limited aerial surveys of selected streams. In the Anvik River, a major tributary in the lower Yukon River drainage, a minimum escapement of 845,000 was estimated. The Yukon River fall chum salmon run was also above average as indicated by catch per unit effort and escapement data. The Norton Sound chum runs were judged only slightly better than average and the record catch was influenced by greater effort in areas not previously fished.

The 1975 commercial king salmon catches in the Yukon (63,000) and Kuskokwim (28,000) districts were considerably below average. The harvest in both districts was influenced by fishing restrictions imposed to provide for escapement requirements. The Kuskokwim River king salmon run was judged average or slightly below average in magnitude. Yukon River escapements of king salmon in index streams ranged from below average to average. Overall, the run was considered one of the smallest in the past 15 years.

SUBSISTENCE FISHERY

The 1974 subsistence harvest for the region was 548,200, down slightly from the take of 707,000 salmon in 1974. Catches were average to slightly better than average.

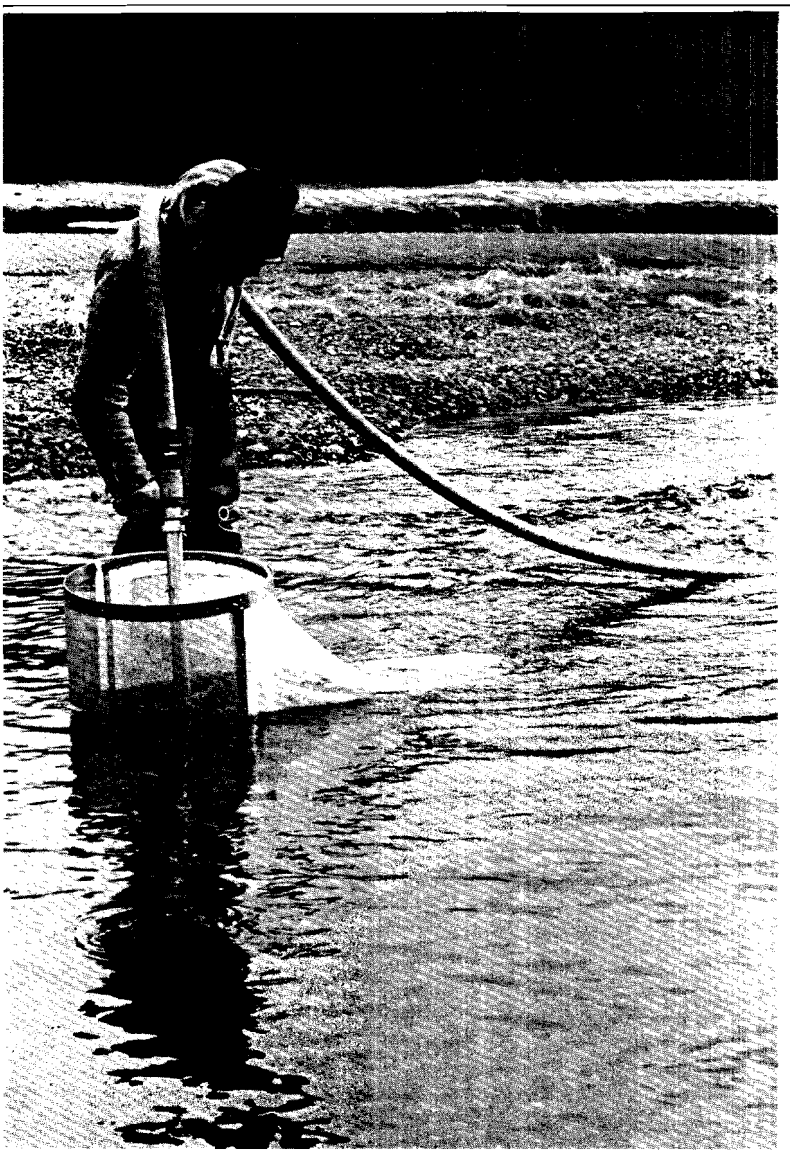
	Kings	Chums	Total
Kuskokwim	48,000	180,000	228,000
Yukon	15,000	255,000	270,000
Norton Sound	200	22,000	
Kotzebue		28,000	
Total	63,200	485,000	

SUMMARY OF SPECIAL PROJECTS CONDUCTED IN THE ARCTIC-YUKON-KUSKOKWIM REGION BY THE DIVISION OF COMMERCIAL FISHERIES, 1974

Kuskokwim River Test Fishing

Location: Kwegooyuk on the east bank of the mouth of the Kuskokwim River, 56 river miles downstream from Bethel.

Objectives: Determine run timing and relative abundance of king, red and chum salmon.



Yukon River Test Fishing

Location: Flat Island in the south mouth of the Yukon River.
Objectives: Determine run timing and relative abundance of king and summer chum salmon in the south mouth channel of the Yukon River.

Subsistence Salmon Fishery Surveys

Location: Kuskokwim River, Yukon River, Norton Sound, Port Clarence and Kotzebue Sound.
Objectives: Determine subsistence utilization of salmon and fishing effort needed for formulating future management procedures and goals and to collect tag recoveries from high seas and department tagging programs.

Kogrukluk River Counting Tower

Location: Mouth of the Kogrukluk River, tributary to the Holitna River (Kuskokwim River system).
Objectives: Determine daily and seasonal timing and magnitude of all species of salmon entering this stream; sample for age, sex and size information.

Yukon River Anadromous Fish Investigations

Location: Yukon River drainage.
Objectives: Develop estimates or indices of the magnitude and quality of king and chum salmon escapements, determine size and effect of commercial and subsistence harvest on various stocks of king and chum salmon.

Kwiniuk River Counting Tower

Location: About five miles upstream from the mouth of the Kwiniuk River in Norton Sound, located about 110 miles east of Nome.
Objectives: Determine daily and seasonal timing and magnitude of all species of salmon entering this stream; sample for age, sex and size information.

Arctic Salmon Studies

Location: Unalakleet River, Norton Sound and Noatak River, Kotzebue Sound.
Objectives: Use of tagging studies to determine migrational pattern and timing of salmon in the Unalakleet River drainage; develop indices or estimates of the magnitude and quality of king, chum and pink salmon in the Unalakleet River system by use of tagging studies and a counting tower on the North River. Determine the size and effect of the commercial and subsistence harvest on various stocks of salmon and relate these to long-term trends in the salmon stocks.

Upper Yukon River Salmon Investigations

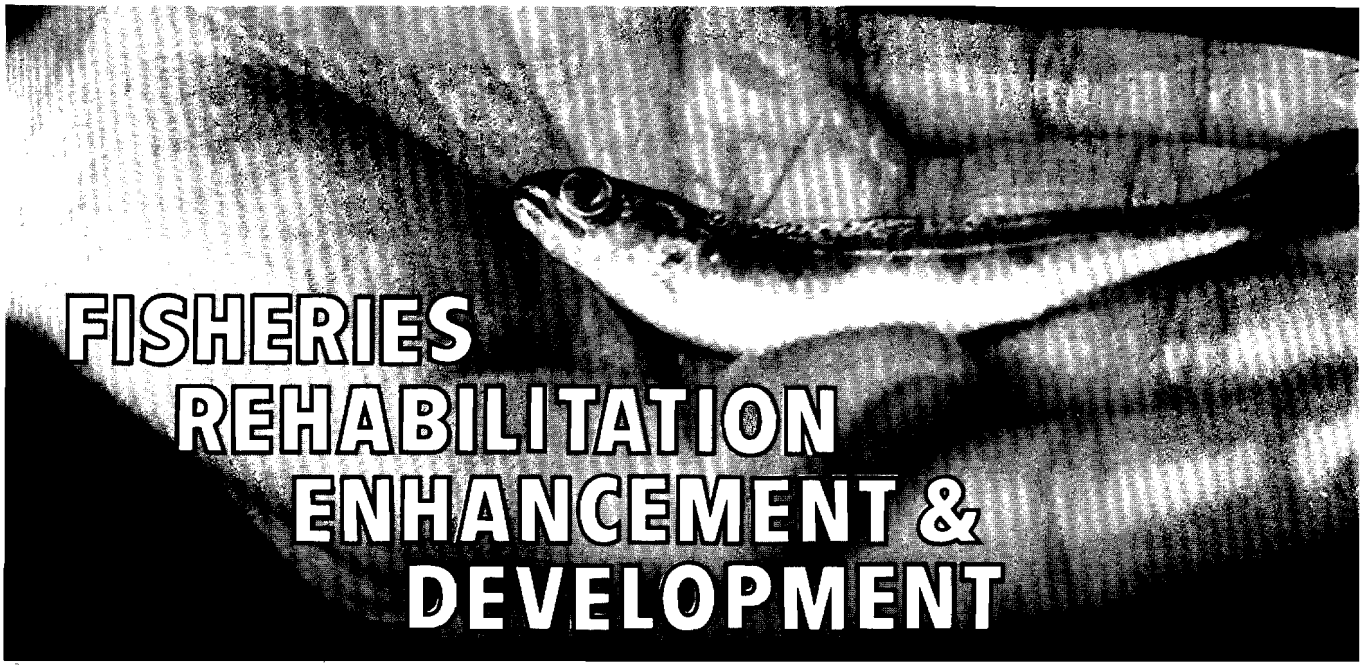
Location: Upper Yukon River from Ruby to Fort Yukon, including Koyukuk and Tanana Rivers.
Objectives: Obtain accurate commercial catch information in addition to collecting age, sex and size data and tag recoveries; distribute information regarding licensing and regulations.

Commercial Salmon Catch Sampling

Various Locations: In all districts.
Objectives: Obtain age, sex and size information for commercially caught fish.

Kuskokwim River Whitefish Investigations

Location: Kuskokwim River drainage.
Objectives: Determine whitefish taxonomy, movements, locations of spawning areas and age, sex and size compositions of various populations.



FISHERIES REHABILITATION ENHANCEMENT & DEVELOPMENT

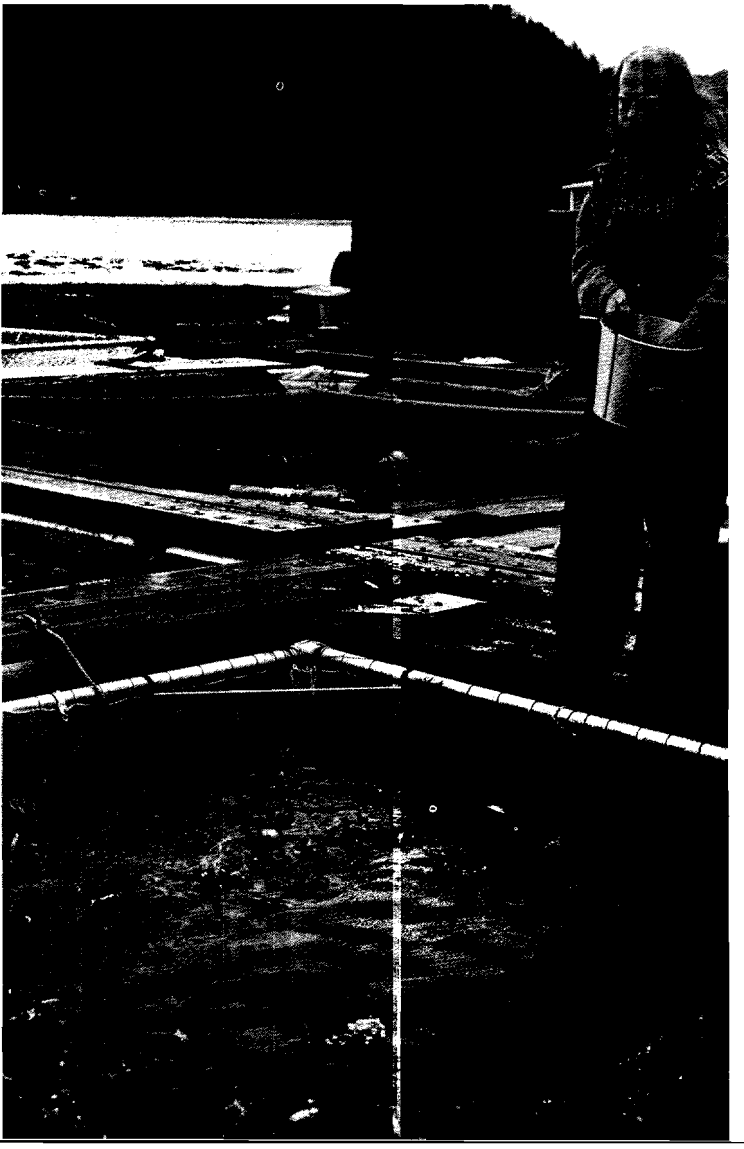
DIVISION OF FISHERIES REHABILITATION ENHANCEMENT AND DEVELOPMENT

The Division of Fisheries Rehabilitation, Enhancement and Development was created by the 1971 legislature (AS 16.05.092). The division has the responsibility to: (1) develop and continually maintain a comprehensive, coordinated state plan for the orderly present and long-range rehabilitation, enhancement and development of all aspects of the state's fisheries for the perpetual use, benefit and enjoyment of all citizens and to revise and update this plan annually; (2) encourage the investment by private enterprise in the technological development and economic utilization of the fisheries resources; and (3) through rehabilitation, enhancement, and development programs do all things necessary to insure perpetual and increasing production and use of the food resources of Alaskan water and continental shelf areas.

The report year was highlighted by rapid growth of the division, both in facilities and numbers of projects. Positions required to operate the new facilities and implement new programs were filled. A staff biologist (anadromous fish specialist) was hired and assigned to the headquarters office.

Methods employed in enhancement and rehabilitation efforts include:

1. **ESTUARINE REARING:** Floating pens in saltwater are supplied with a mixture of fresh and saltwater for salmonid rearing. The warmer sea water results in greater growth and survival of the fish, particularly in areas of extreme climatic conditions.



2. **SUBSTRATE INCUBATION FACILITIES:** Salmon eggs are incubated in troughs with a gravel of astroturf substrate. Survival of the resulting fly in this controlled environment is in excess of five times that of the natural environment.

3. **LAKE REHABILITATION:** Previously the removal of predator and/or competitor species has been accomplished by the removal of all species by a relatively expensive chemical treatment. The F.R.E.D. and Sport Fish divisions have a contract with Dr. Craig McPhee of the University of Idaho for development of a selective toxicant for stickleback. This species is a major food competitor with juvenile salmon.

4. **FISHWAYS:** The aluminum Denil type fishpass plus some modifications as required at specific locations is continuing to produce very satisfactory results.

5. **LAKE STOCKING:** Both juvenile and adult salmon were stocked in 1975. Juvenile plants have proven to be successful in stocking small lakes or those having no salmon populations or limited indigenous stocks.

6. **STREAM IMPROVEMENT:** This work consists of removing debris from streams, placing flumes through beaver dams to allow salmon passage and constructing dikes to prevent scouring of spawning areas.

7. **DEVELOPMENT OF IHN VIRUS VACCINE:** Lake system surveys are continuing as are testing of brood stocks, fry vaccination and vaccine development.

8. **PARASITIC INVESTIGATION:** The objective of this project is to determine the incidence and distribution of *Triaenophorus Crassus* in the northern pike, sockeye salmon and arctic char (adult and juveniles). The histopathological effects of T. crassus on sockeye smolts also are being studied.

ADMINISTRATION

The fisheries pathology laboratory in Anchorage has been completed. A fisheries pathologist I and a microbiologist were hired which has increased the number of diagnostic inspections and field surveys for IHN virus sampling. Preliminary processing has revealed that arctic char are heavily parasitized by cestodes and other parasites. Assessment of the rate of infection in sockeye juveniles and adults has not been completed.

SOUTHEASTERN ALASKA

The planning function of this region was implemented with the hiring of a fisheries biologist IV. One of his priority duties will be investigating sites for potential incubation and rearing facilities. Emphasis during the year was placed on expansion of incubation and estuarine rearing facilities.

ESTUARINE REARING FACILITIES:

FISH CREEK: A total of 24,128 coho smolts were released on May 29 and 30 from the Fish Creek pen rearing facility near Juneau. Survival of these fish from mid-October until release was 91 per cent. This facility has been expanded to a capacity of 275,000 smolts. The operation may be restricted during early 1976 because of the lack of 1974 brood year fish.

STARRIGAVAN: An incubation building was constructed adjacent to Starrigavan Creek and will be used in conjunction with the estuarine pen rearing facility. The ultimate capacity of the new incubator will be 3-4 million salmon eggs. As of Dec. 31, 1975, about 1.5 million coho eggs were on hand at this facility. Approximately 121,298 coho and 2,063 king salmon were released from the Starrigavan rearing pens with a percentage of each species marked by a coded wire tag and removal of the adipose fin. At year's end, 177,281 coho fingerlings were on hand. During the fall of 1975, 184 adult cohos were captured for spawning purposes from Starrigavan Creek. Of the adult coho of the 1972 brood year, reared at Starrigavan, 78 were taken by the commercial fishery and six were taken in the sport fishery. Plans are to develop a brood stock indigenous to Starrigavan Creek which will result in greater harvests and returns to the system.

GEORGE INLET: Total chum salmon fry production from this facility was 849,000 plus 125,200 at Deer Mountain hatchery for a total of 974,200. About 92,600 fry from the George Inlet facility were fed in saltwater pens from April 29 (at 1,231 per pound) and released on June 2 at 407.5 per pound. In the 34-day rearing period, their size approximately tripled. Approximately one half of these fish were marked by removal of the adipose and left ventral fins. Plans are to short-term rear approximately 2 million fry in 1976 due to these encouraging results. The 125,200 fry reared at Deer Mountain hatchery were returned to Disappearance Creek, the stream of origin, for imprinting and return studies. About 75,300 of this number were marked by the removal of the adipose and right ventral fins. As of Dec. 31, 1975, 4.3 million eyed chum salmon eggs were on hand at the George Inlet facility.

DEER MOUNTAIN HATCHERY: This hatchery is used for salmon egg incubation, evaluation of imprinting of various salmon species and for establishing a brood stock run of king salmon. Thirteen thousand vigorous feeding king salmon fry of Chickamin River origin are on hand at this facility. Another 20,000

coho eggs plus 2,500 coho fingerlings and 2,000 hatching pink salmon eggs are also present at the hatchery. The coho fingerling and pink salmon are being studied by the local high school biology class.

CONTRACTED STUDIES

Work on the possibility of development of a fisheries facility at the Snettisham hydroelectric site continues. Contracted studies by a hydrologist and oceanographer to assemble background information pertinent to the use of the constant water supply and salmon rearing potential in the estuary have been completed. Under the terms of a cooperative agreement with the University of Alaska, a graduate student with a background in biology and oceanographic engineering will be working on conceptualization and possible design.

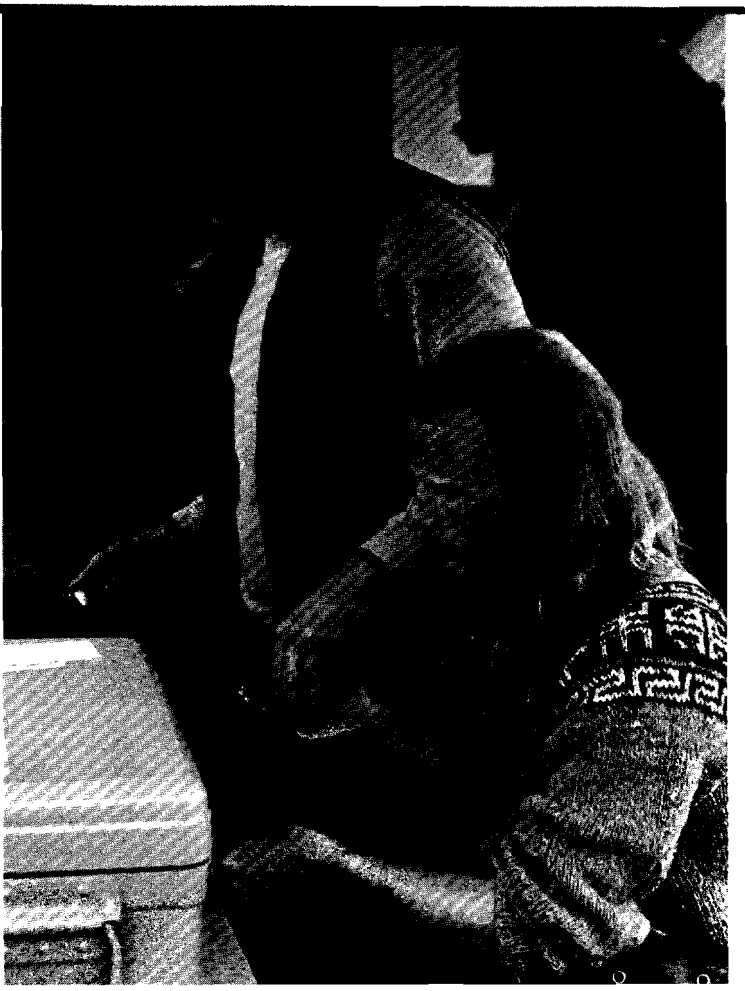
COOPERATIVE PROGRAMS

NAVY CREEK: A fishway was constructed at Navy Creek, Etolin Island. Design and supervision was provided by Department of Fish and Game engineers and the construction work accomplished by the U.S. Forest Service. The steep-pass fishway proved to be an immediate success as 7,530 pink salmon were observed spawning above the fishway and 300 in the intertidal area. Past records indicate that much greater returns occurred following years when the majority of the spawners were able to negotiate the falls. The even-year run has been depressed and the odd-year run was declining in the percentage of upstream spawners. The fishway should help substantially in rebuilding both cycles.

FISH CREEK (NEAR HYDER): A dike constructed initially in 1974 was repaired, strengthened and extended in 1975. The work was a cooperative venture in 1974 and 1975 rebuilding was funded by the Department of Highways, U.S. Forest Service, and Department of Fish and Game. The purpose of the dike is to prevent scouring of valuable chum salmon spawning areas in Fish Creek by flood waters of the Salmon River. The two years of protection afforded this valuable run of very large fish has precluded possible extensive loss of spawn.

OSPREY LAKE ENHANCEMENT: This is a cooperative venture with the National Marine Fisheries Service. The purpose of the project is evaluation of stocking natural lakes with artifically produced coho fingerling. About 277,000 coho fingerlings were stocked in this from about July 14-20.

LITTLE PORT WALTER ESTUARINE REARING FACILITY: This cooperative program with National Marine Fisheries Service had excellent return of 14,900 adult cohos in the fall of 1975. Survival from smolt to adults



was 8 per cent. About 160,000 fingerling are currently being reared at this facility.

AUKE BAY INCUBATION: This is a cooperative program with the National Marine Fisheries Service. Returns to this facility for the past three years utilizing gravel substrate for incubation are as follows: 1973 - 4,948; 1974 - 6,260; and in 1975 - 14,261. Evaluation of other types of substrate are planned for this facility.

CENTRAL - AYK - WESTWARD REGION

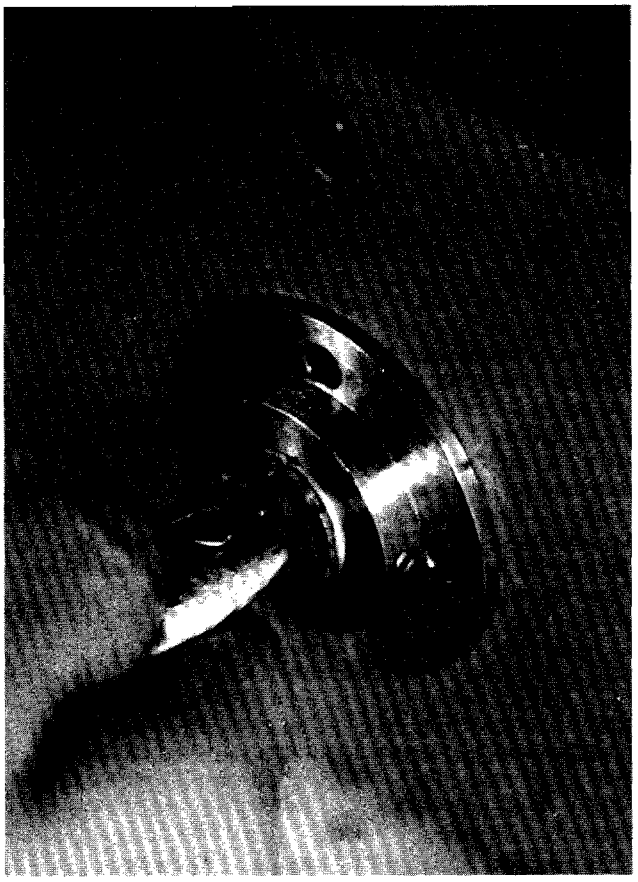
The planning function of this region was implemented with the hiring of a fisheries biologist IV. One of his priority duties will be investigation of sites for potential incubation and rearing facilities.

PROJECTS

AKALURA LAKE: This lake on Kodiak Island was originally scheduled for rehabilitation (treating with rotenone to remove all fish life) and subsequent stocking with juvenile sockeye salmon as the existing run had undergone a long-term decline. However, in 1974, the sockeye escapement of over 31,000 exceeded all previous records since the department began monitoring the system in 1968. The sockeye escapement in an adjacent system, Upper Station Lake, was greater than any recorded

since 1945. The escapement at Akalura in 1975 of 16,129 sockeye was the second highest since 1968. Following the outstanding sockeye return to Akalura in 1974, plans for restoration of this run were revised to attempt supplementing natural production rather than rehabilitation and restocking of the system and 2,000 adult sockeye spawners were transferred from Upper Station Lake to Akalura in 1975. Plans call for introduction of supplemental spawn into this system until at least 1980 by spawner transplants and possibly by egg incubation systems. The supplemental restoration effort will be closely evaluated and if it is unsuccessful, the original proposal of rehabilitation will be reconsidered.

FRAZER SYSTEM: This sockeye run was started in 1951 with green egg plants followed by fry and adult spawner transplants. The rapidly increasing escapement trend beginning in 1971, coupled with exceptionally large smolt production in recent years, indicates that this run is rapidly building toward its maximum production level. It presently contributes substantially to the sockeye fishery. Sockeye salmon passage through the Frazer fish ladder since its construction is as follows:



1962	1,290	1969	13,981
1963	2,357	1970	24,039
1964	8,166	1971	55,366
1965	5,074	1972	67,302
1966	11,728	1973	56,255
1967	14,500	1974	82,350
1968	16,708	1975	64,199
			423,315

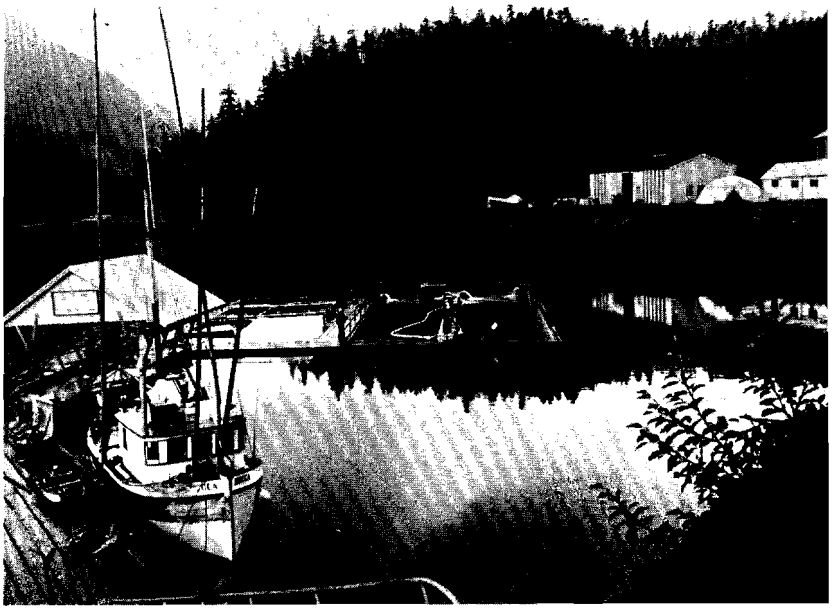
Due to the rapid development of this run, it will be necessary to double the expansion of the existing fishway. A contract has been let with a private consulting firm to complete a final design for the Frazer ladder expansion and design of a fishway for Apollo Creek on Unga Island. Terms of this contract also call for an engineering survey of the barrier falls on Middle Creek, Pavlof Bay.

KITOI INCUBATION: The return of pink salmon to this facility was 18,550 in 1975 and originated from the production of 447,462 artificially reared fry and 391,750 wild fry. The return in 1974 was 12,500 which was double the escapement of past years. The 1974 run originated in part from the release of nearly 500,000 fry from the Kitoi hatchery gravel incubators and troughs. Another 3.3 million pink salmon alevins were on hand at this facility as of Dec. 31. Approximately 800,000 of these alevins are of Seal Bay Creek origin. Plans call for planting pink salmon fry above the fishway in Seal Bay Creek (constructed in 1972) in an effort to establish an upstream run. Results of the imprinting experiment will be closely monitored. The fishway project is a joint U.S. Forest Service and Department of Fish and Game effort. A total of 1.2 million eyed pink salmon eggs of Big Kotoi Creek origin were planted in four streams of Izhut Bay, Afognak Island. Previous foot surveys of these creeks indicated below average pink salmon escapements. The egg plants will be initially evaluated on the basis of pre-emergent fry densities by hydraulic sampling in the spring of 1976.

ALASKA PENINSULA SALMON SUBSTRATE INCUBATION FACILITIES: Escalating costs in this extremely remote area indicate that it may be advisable to recommend building one facility. Russel Creek near Cold Bay is currently under investigation. Plans call for continuing water and site investigations and for selection of the site as soon as possible. Construction is planned for the fall and winter of 1976.

KARLUK INVESTIGATIONS: The Karluk sockeye runs which once were the major source of sockeye production in the entire westward region were decimated by overfishing many years prior to statehood. A large fry rearing potential exists in the Karluk Lake system due to the present low adult escapements. Presently recruitment from the low returns leaves a 90 per cent fry deficit that needs to be filled over a period of years by artificial incubation. The presently planned project will evaluate production and enhancement alternatives, design and constraints of the selected alternative. The facility will represent a major enhancement effort for Karluk Lake and will be designed to utilize the unfilled natural rearing potential of the lake.

EAST CREEK SOCKEYE SUBSTRATE INCUBATION FACILITY (LAKE NUNAVAUGALUK, BRISTOL BAY): Accomplishments include development of stickleback control



(trapping) measures, and extensive studies on the distribution, timing and abundance of aquatic insects (food utilized by juvenile sockeye, stickleback and other species). Plankton were studied in cooperation with the National Marine Fisheries Service. Juvenile sockeye and other fish were sampled to determine seasonal distribution, age and size of the various species. Experimental incubation and rearing of sockeye fry is continuing. A grant (EDA) of $360,000 has been received for construction of sockeye rearing facilities. The facility has been designed by private consultants following department engineering guidelines and is currently undergoing department review. Alternative egg-take sites are under study in the event that sufficient spawners are not available at Lake Nunavaugaluk.

HALIBUT COVE LAGOON ESTUARINE REARING FACILITY: One hundred adult cohos returned to this facility in the fall of 1975. In addition 10-20 more adults were observed in the area. About 5,300 coho smolts of Seward Lagoon origin and 3,700 fingerling king salmon were released at Crooked Creek on Aug. 6 for an imprinting study. Another 141,217 coho fingerling were stocked in Caribou Lake on Oct. 10 to test overwintering potential in this lake system. Other releases from this system in Halibut Cove Lagoon included 3,463 king salmon fingerlings and 7,100 coho smolts. Both lots were coded wire tagged and fin clipped. In addition, 50,915 pink salmon, 10 per cent adipose clipped and 595 large chum fingerling were released from this facility into Halibut Cove Lagoon. Also, 123,000 coho fingerlings were on hand at this facility as of Dec. 31 and 123,300 coho eggs were taken from spawners returning to Halibut Cove Lagoon.

CROOKED CREEK: This incubation system was revamped during the past year to improve overall efficiency. A building was constructed to house the incubation units and thus prevent past freeze-up problems. The water supply system was changed to provide more volume and reduce silt. Crooked Creek has a small but viable run of king salmon which should provide a continuous supply of eggs. Stocking this stream with artificially reared smolts will provide a test of the potential to enhance runs in small streams.

Major emphasis will be placed on the enhancement of the Tustumena system. The feasibility of returning large numbers of unfed or short term reared sockeye fry to Tustumena tributaries will be tested. Glacier Creek, formerly a good spawning tributary of Tustumena Lake, is apparently undergoing an irreversible natural loss of spawning area. The transplants of fry are intended to replace this loss plus increase production in this system. About 4,284,000 red salmon eggs (50 per cent hatched) were on hand at the Crooked Creek facility at year's end. Approximately 40,000 of this number were taken from Packers Lake and the resultant fry will be returned to that lake. About 515,800 pink salmon alevins are on hand at this facility and will be transferred to Tutka Creek. Another 105,000 king salmon fingerlings of Crooked Creek origin are being reared at the Elmendorf ponds.

TUTKA INCUBATION FACILITY: This facility has been completed and will be operational in 1976.

BIG LAKE FACILITY: This facility was also completed and will be holding 100,000-plus sockeye fry previously incubated in a temporary facility.

STREAM IMPROVEMENT: Debris removal and/or placement of flumes through 11 streams in Cook Inlet, debris removal in one stream in the Westward Region, plus four in Southeastern Alaska was accomplished during the 1975 season.

GAME

The Game Division, in accordance with the concept of sustained yield as specified in Section 4, Article VII of the Constitution of the State of Alaska, has the responsibility of conducting a conservation program involving all species of land animals and marine mammals in the state. Basically, the goal of the division's program is to provide maximum benefits to the citizens of Alaska through orderly utilization of the state's game resources.

Game Division operations, which are directed toward managing, maintaining and improving game resources while knowledgeably directing the utilization of harvestable surpluses, are divided into three distinct categories: management, research and survey-inventory. Management activities include assisting in the development and enforcement of guide and hunting regulations, administration of controlled hunts, preparation of regulatory proposals and public relations work. Research activities and survey-inventories of game populations and their habitat provide information necessary for the proper management of Alaska's game resources.

FEDERAL LEGISLATION

As in 1974, an inordinately large portion of the Game Division's financial and manpower resources were diverted to solving problems caused by recently passed federal legislation. Staff biologists provided leadership on the Governor's working group on D-2 lands and developed the wildlife data required for coastal zone management planning. A moratorium on the taking of marine mammals remained in effect through 1975, but some progress was made toward rectifying this problem when, in December, federal regulations were issued returning authority for walrus management to the state. This means that as soon as effective regulations can be formally promulgated, nonnatives will again be able to harvest walrus.

Efforts proceeded throughout 1975 to regain state control over management of seals, sea lions, belukhas, sea otters and polar bears. It appears now that management of at least sea lions and seals will be returned to the state during 1976. As an interesting aside, the Game Division biologist most involved with rectifying the problems inherent to the Marine Mammals Protection Act of 1972 received an American Motors award as one of the country's 10 top professional conservationists during 1975.

Other federal matters which occupied a substantial portion of Game Division staff time were the Endangered Species Act of 1973 and proposed development of Alaska s outer continental shelf. Two staff biologists were assigned to endangered species recovery teams dealing with the Aleutian Canada goose and the peregrine falcon. These teams are responsible for developing plans which when implemented will result in the recovery of these species' populations to levels insuring their survival. Because these species fall under federal jurisdiction, the state will probably have little involvement with plan implementation.

A move by the Department of Interior late in 1975 to add the "blue" or "glacier" bear to the list of threatened species required much input by division biologists. The proposed inclusion of this subspec-

ies on the endangered and threatened species list was caused by its inclusion as an Appendix I species in the 1973 treaty on world trade in wildlife. This listing in turn was caused by apparent confusion over the difference between a subspecies and a color variation. Resolution of these problems will be slow and painful.

The Secretary of Interior's plans to lease portions of the outer continental shelf in the Gulf of Alaska for oil development in 1975 resulted in major manpower demands upon the Game Division. Reviews of a preliminary DEIS and development of an OCS research program on marine birds and marine mammals occupied much staff time. By year's end a six-man biological staff had been recruited and had begun gathering much-needed information on marine mammal and marine bird populations along Alaska s coast from Yakutat to the Beaufort Sea.

PIPELINE

Human/animal conflicts along the trans-Alaska pipeline route required expenditure of considerable time and effort. Expanded construction crews and high bear populations resulted in major problems at several camps. The two Alyeska Pipeline Service Corp. funded research programs developed in 1974 to monitor the effect of the pipeline on moose and caribou movements gathered baseline information on populations and recorded animal/pipeline confrontations during this period.

WOLF PROGRAMS

Management activities during 1975 seemingly revolved around the wolf or wolf related problems. Faced with declining moose populations and depredations by wolves upon dogs in the Fairbanks area, division biologists attempted a limited wolf control program in Game Management Unit 20A. An Anchorage-based group of environmentalists temporarily halted this program with a court injunction, with the judge eventually ordering a further halt due to legal technicalities. The Board of Fish and Game eventually resolved these legal problems and by year's end the way appeared clear to conduct limited wolf control if necessary. During 1975 several thousand letters and telegrams relating to the wolf issue were answered by the Game Division's headquarters and regional office staffs.

Concommitant with these wolf problems and in an effort to help solve them, a major research program designed to clarify the wolf's role as a predator was initiated in Game Management Unit 13. Activities of some 10 wolf packs in the Glennallen area are being monitored regularly by the use of radio transmitters placed on a number of individual wolves. Summer food habits will be determined by analysis of scats collected at these dens. Eventually the impact of wolf predation upon ungulate prey will be determined by reducing wolf numbers in a study area and monitoring the response of moose and caribou populations to lessened predation.

In further efforts to provide a quality hunting experience in selected areas, the Game Division staff worked closely with the Alaska Guide Board in the establishment of exclusive guide areas for brown bears on Kodiak Island. By establishing these guiding areas and publishing bear harvest goals, we have provided for bear management while maintaining the quality of the hunting experience. In the same vein, the Tok Management Area which was set aside for quality sheep hunting in 1974 was even more successful in 1975.

MUSKOX

Alaska's first muskox hunt was held in September, 1975. Expected public resistance to this management measure, designed to cull old bulls from the herd, did not materialize and the hunt went very smoothly. The staff also monitored transplanted muskox populations on the Seward Peninsula and the North Slope and analyzed prospective sites for future transplants.

BISON

Bison, as usual occupied an inordinately great proportion of management time during 1975. The very productive Delta herd continued to cause problems by invading croplands. Fifty bison were removed from this herd by hunting during September and October -- 35 by hunters accompanying division biologists and 15 by unaccompanied hunters. The high degree of public interest in this hunt is reflected by the odds facing applicants for permits. Odds against obtaining a permit were 75:1 for the guided hunt and 43:1 for the unguided hunt.

SEA OTTERS

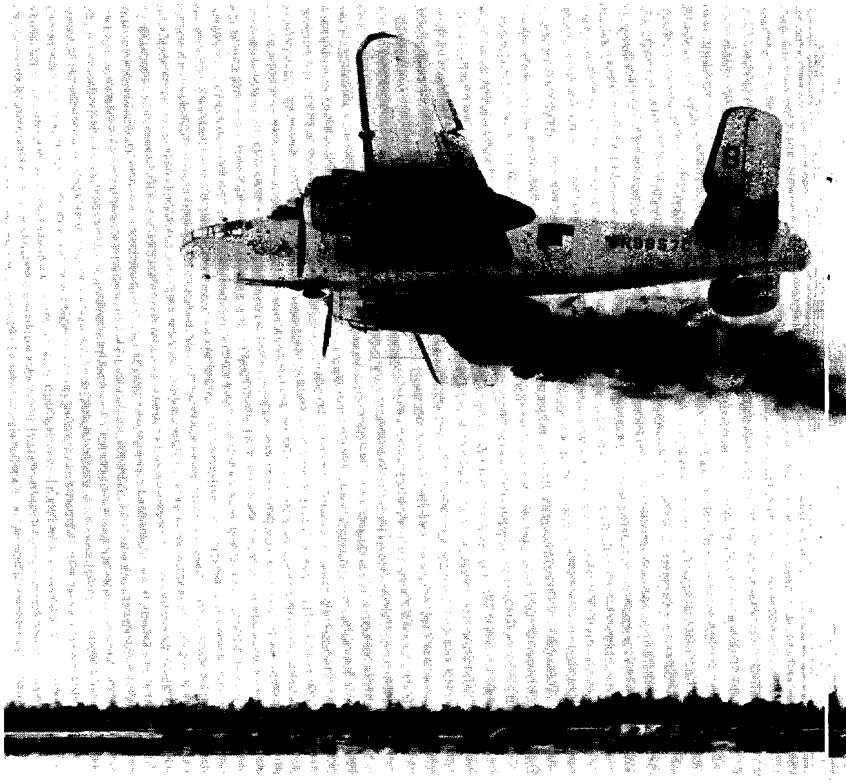
In 1975, division biologists conducted the first complete census of sea otters in Southeastern Alaska following their reintroduction during the late 1960s. This species, absent in Southeastern Alaska waters for nearly a half century, is now flourishing. Populations are estimated to exceed 400 animals.

DEER

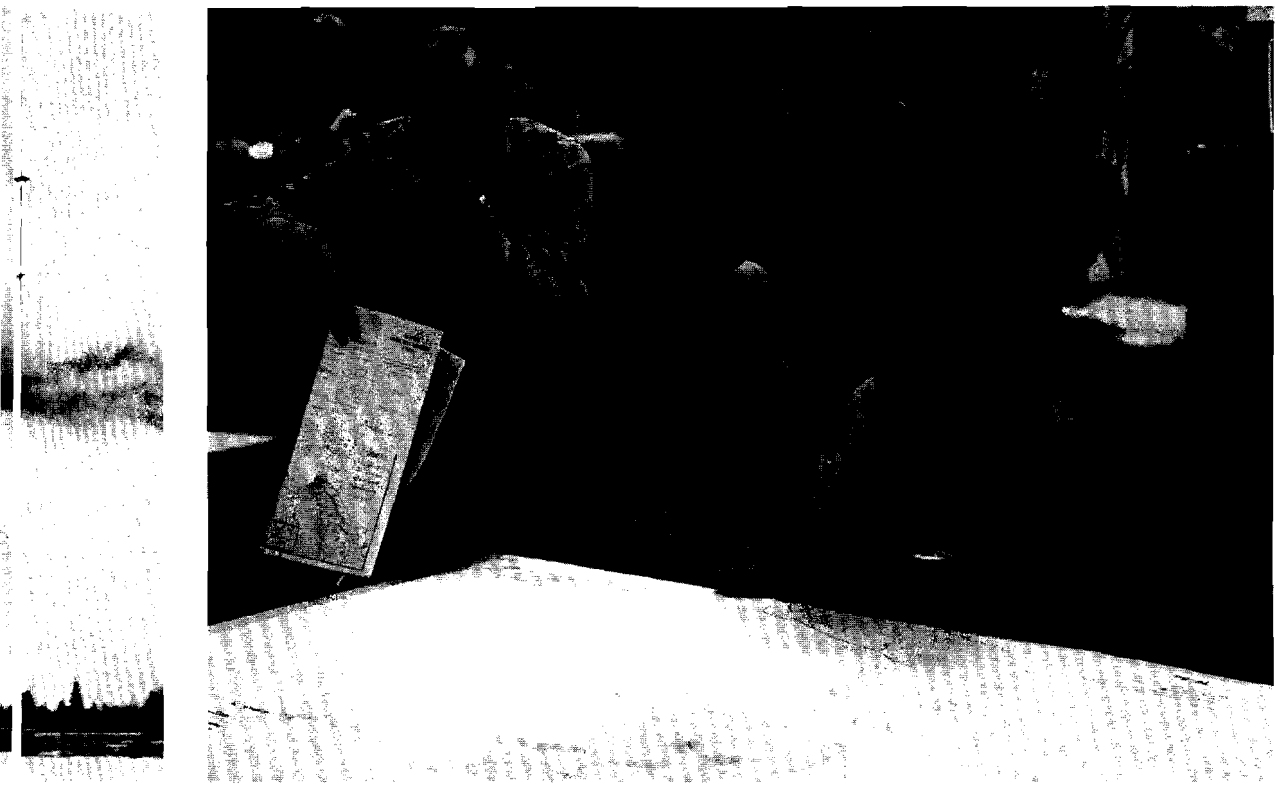
Favorable weather and high deer populations resulted in perhaps the best statewide deer harvest since 1968. Harvests in game management units 2 and 3 were low as these deer populations have not recovered, partly because of predation by wolves. Alaskans, plagued by several years of poor deer hunting and facing severely reduced populations of other ungulates such as moose and caribou, took advantage of this source of protein.

CARIBOU

In a continuing effort to update the division's knowledge of major caribou herds, staff biologists made a complete census of the Alaska Peninsula



Spreading coal ash on Creamer's Field to speed snow melt.



herd in 1975. Weather problems thwarted efforts to do the same with the arctic caribou herd. Studies of this herd and its utilization by residents of Alaska's northwest coast reflected that all was not well with it. Although as yet inconclusive, data collected during 1975 indicate that this herd is being overexploited at present and as a result is declining in numbers.

HUNTER SAFETY

The division's Hunter Safety Program continued to expand its effectiveness in providing safe gun handling training and it increased its services to residents by operating the Rabbit Creek Rifle Range near Anchorage. Approximately 15,000 shooters used this facility during a 6-month period ending in October. During 1975, negotiations were initiated in Homer and Kodiak which will hopefully result in readily available rifle ranges in these towns during 1976.

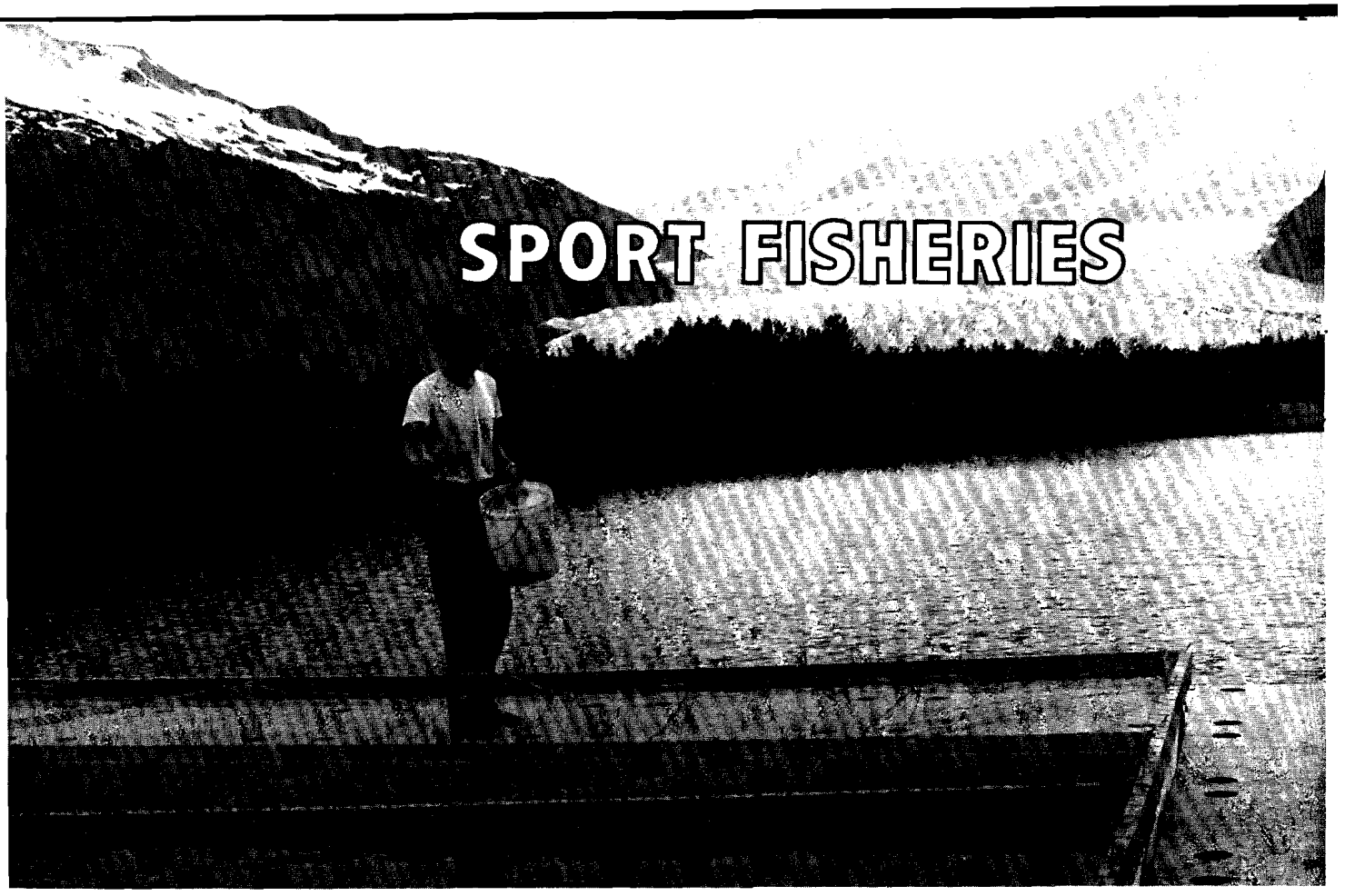
OTHER RESEARCH

Ongoing studies of moose, brown bear, sheep, black bear, goats and wolves continued to provide information for managers. Staff research biologists published 10 papers in professional journals and proceedings of technical meetings during 1975 and many division biologists served on editorial committees for journals during this period. Work was completed on the division's Wildlife Technical Bulletin No. 5 entitled "Ram Horn Growth and Population Quality -- Their Significance to Dall Sheep Management in Alaska" during 1975 and this document will be distributed early in 1976.

Field work on major long-term research studies of brown/grizzly bears on the Alaska Peninsula and North Slope was essentially completed during 1975. These studies, aimed at providing intensive information on a heavily exploited population (Alaska Peninsula) and a population facing encroachment by industrial man upon its habitat (North Slope), have provided a wealth of information upon which to base management decisions.

Game Division research biologists participated in several joint U.S./Russian research activities in 1975. Visiting Russian reindeer experts were hosted in Alaska and worked with division caribou biologists on several field programs. At the same time the division's wildlife disease specialist journeyed to Siberia during August to participate, with several Russian scientists, in a study of the parasites of snow sheep.

Divisional planning efforts progressed well through 1975 and it is expected that draft species management plans will be ready to take to the public by early spring 1976.



SPORT FISHERIES

The Sport Fish Division is responsible for the orderly management of the recreational fisheries of the state. In meeting this obligation the division provides through its professional staff the necessary expertise, research programs and development of management techniques to establish the guidelines that will minimize the impact on fishery habitat caused by industrial and urban development and to supply the pertinent biological data to efficiently meet these demands. This division provides the basic vehicle for public expression on the management and ultimate use of fishery resources for recreational purposes. Toward this end, divisional efforts encompass many and varied programs.

Improving public awareness and understanding of a renewable resource is accomplished through:

1) Statewide efforts in several urban educational programs directed toward informing and developieg an awareness and conservation attitude in Alaska's youth.

2) Special presentations to sportsmen organizations and special interest groups on biological problems and findings necessitating public awareness - - including workshops, special programs, displays and direct involvement (show me and participate) of the public in divisional programs.

3) Development of printed materials to better inform the users of the resource. Of note is the department's first full color poster of Alaskan sport fishes. In all, the division publishes annually some 13 brochures and pamphlets for public dissemination.

Better understanding of resource needs is accomplished through the scientific staff's research efforts. Findings are made available through progress reports, management reports to the board and public presentations. Through cooperative agreements with the agencies involved, the division participates in the Coastal Zone Management Program, Joint Federal-State Land Use Planning Commission, NOAA, Outer Continental Shelf studies, Department of the Interior, Susitna (Devil's Canyon) River studies and University of Alaska cooperative water quality studies.

REGION I (Southeastern Alaska)

Highlights of this year's accomplishments included: the passage of several regulations by the Alaska

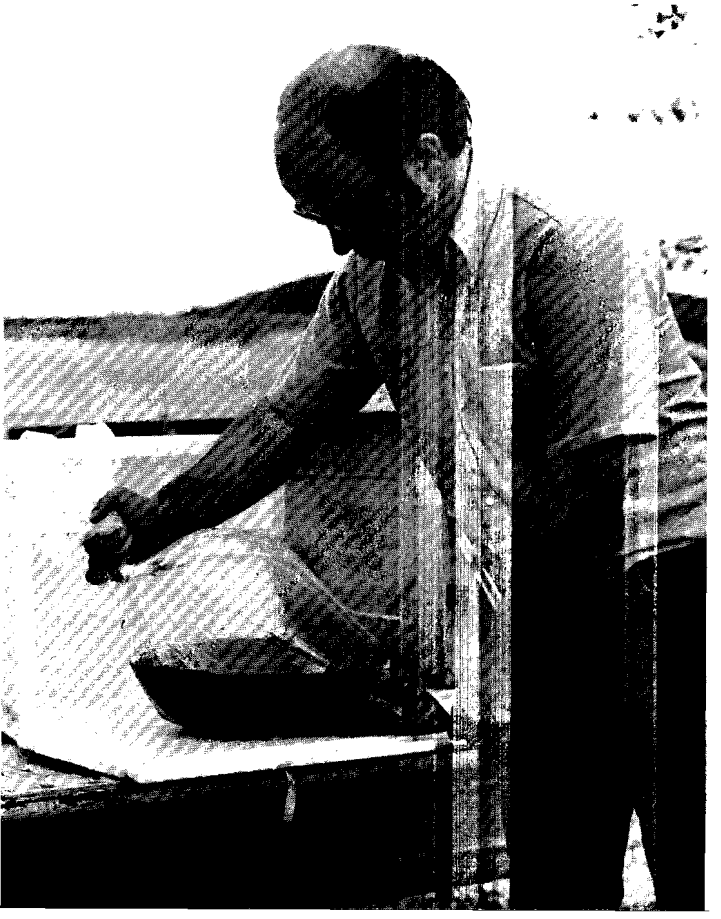
Board of Fisheries needed to protect the dwindling Taku River chinook salmon stocks (most of these regulations were based on information collected under our chinook salmon study); a successful discovery of the spawning habits of cutthroat trout; a survey of recently logged areas which indicated many of our recommendations for protecting the fish resource were being followed; the collecting of preliminary information on the interaction of Dolly Varden and coho in lakes which indicates little, if any, effect on introduced coho young by an established Dolly Varden population; and a successful return of 4,451 adult coho to the Mendenhall fish rearing facility this fall.

LAND-USE STUDIES

This year, project D-1 participated in joint ADF&G resource inventories in Tenakee Inlet and the Yakutat Forelands. Recommendations concerning the protection of sport fish resources were submitted for inclusion in the Forest Service Environmental Impact Statements.

In addition to the initial resource inventories, project personnel have examined current logging areas to determine how well protective measures recommended by the division were followed by USFS and the logging operators. Most recommendations have been followed but some protective measures, usually those most crucial to fisheries productivity, have been ignored or only partially fulfilled.

The Land Use Study also conducts research on the effects of logging on juvenile salmon and trout. Present findings by the project include logging debris in streams can limit the amount of insect biomass, the primary food for juvenile fish, by as much as 50 per cent; small tributary streams, often overlooked by loggers, are nursery areas and allow greater survival to juveniles than do mainstream areas; juveniles are very mobile and require free access to tributaries when leaving the mainstream; the logging of headwater and tributary streams can upset the ecological balance of the watershed causing a decrease in productive capacity; overwinter survival of juveniles is greater in streams having groundwater influence, thus they require additional protective measures during logging.



Research findings by this project and other agencies are used as management tools and incorporated into federal environmental impact statements and for state policies regarding sport fisheries protection.

CATALOG AND INVENTORY

The Naha River drainage was studied as part of the continuing limnological evaluation of lakes in

Southeastern Alaska. Intensive limnological and fishery investigations were conducted on six of the lakes in this high quality recreational area. An evaluation of the recreational opportunity and importance of the area will be completed this winter. This information will be used to determine suitability of the Naha System for classification and subsequent protection from undesirable development.

An evaluation of hydroacoustic techniques and the effectiveness of these techniques in estimating fish abundance, distribution and size was attempted in lakes. A review of literature demonstrated the usefulness of echo sounding to locate fish. During the summer of 1975, acoustic surveys were conducted on three small lakes where the number of fish and/or species composition were known. Comparison of these data with a reliable population estimate from mark/recapture indices will provide valuable insights on how to interpret acoustic data from small lakes.

Interspecific relationships between an established Dolly Varden population and introduced rearing coho were studied in Osprey Lake, a landlocked lake on Baranof Island. The distribution, size and food habits of the species were compared. Distribution abundance, and size of fish was determined by sampling with minnow traps, and employing mark/recapture techniques. Approximately 200 fish of each species were collected for food habit analyses. Fish captured for food analysis were of all available sizes and from all locations in the lake.

A creel census study was conducted in the Juneau area to monitor the level of angler effort and catch success in that areawide sport fishery. Specimen data were taken from the king, coho and halibut caught by anglers. Numbers of king and coho caught from the natural run as well as other specimen data will be compared to marked kings and cohos returning to the Mendenhall Lakes salmon rearing facility. The results of these analyses will be used to evaluate the facility's contribution to the areawide sport fishery..

The contribution of coho returning to the Starrigavan Bay saltwater rearing facility was evaluated in the Sitka area sport fishery. The level of angler effort and catch success was sampled and the results of that analysis will be used to estimate the contribution of salmon attributed to the rearing pens from the number of returning salmon tagged with a coded wire tag.

Catch statistics and specimen data collected from Pacific halibut in the Juneau and Sitka sport fisheries will be used to recommend management policy and also be forwarded to the International Pacific Halibut Commission for their information.

CHINOOK SALMON STUDY

Due to depressed runs in recent years, major emphasis this year was placed on collecting data associated with the Taku River king salmon population. Young king salmon were captured throughout the Taku River watershed to determine habitat preference and availability of young for future tagging studies.

Gillnet mesh studies were conducted during open commercial fishing periods to determine if gill nets of 5 3/8" or 6 3/8" stretched measure mesh would significantly reduce the harvest of female king salmon and increase the harvest of males. Escapement surveys have shown that there are from 3 to 13 males on the spawning ground for every female.

A large number of these surplus males could be harvested with no detriment to the population if a gear could be developed that permitted the majority of females to escape. The 5 3/8" and 6 3/8" mesh gillnets were more efficient at harvesting the smaller males but significant numbers of females were taken.

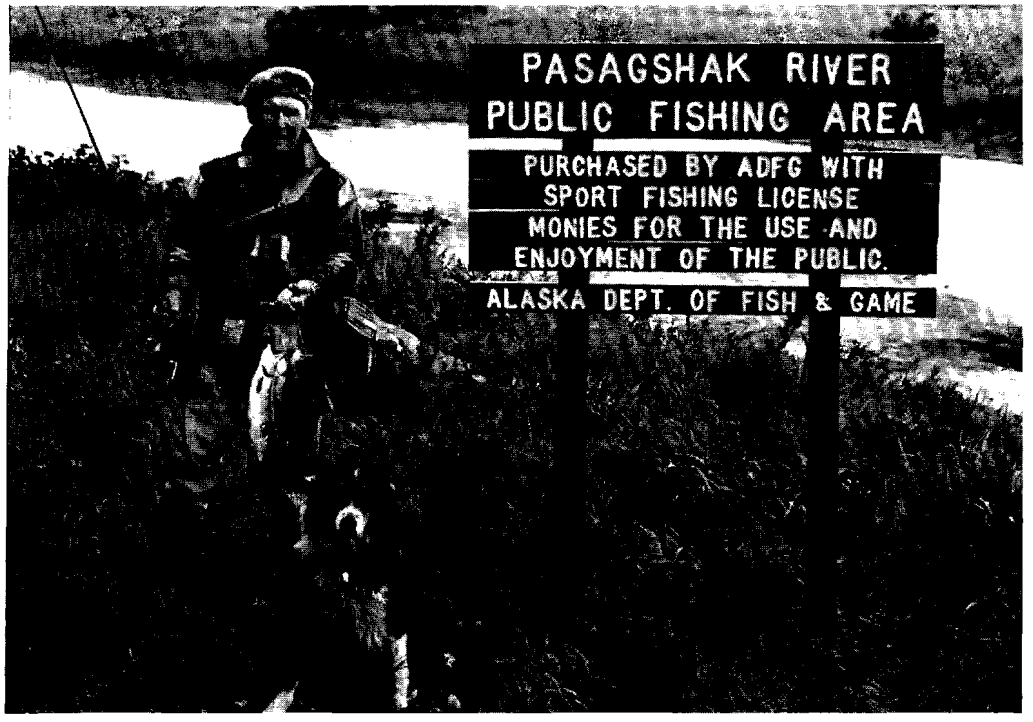
During early August a king salmon egg take was conducted on the Nakina River and 210,000 eggs were collected. The resulting young will be used to develop a brood stock for enhancement of local fisheries.

Helicopter and ground surveys of other important king salmon spawning tributaries were completed. Escapements were low in all tributaries surveyed except in the Tahltan drainage of the Stikine River.

STEELHEAD - CUTTHROAT STUDIES

The steelhead-cutthroat life history project has just completed its fifth year of operations at the Petersburg Creek research facility. Numbers of adult steelhead returning to Petersburg Creek have declined during the past two years. This decline is believed to be in part due to the bad winters of 1971 and 1972 which took a heavy toll of rearing fish. To offset these declines in steelhead abundance, steelhead were reared to smolt size at the new Crystal Lake Hatchery and 8,000 were released in Petersburg Creek in early June. These smolts will return as adults in 1977 and 1978.

Investigations into the spawning habits and requirements of sea-run cutthroat were continued in



1975. Results of these surveys point out that cutthroat do most of their spawning activity under the cover of darkness.

Work was initiated to determine the origin of sea-run cutthroat entering the Petersburg Creek system to overwinter. Several hundred cutthroat were tagged in six area streams in July. These fish were monitored as they passed upstream to Petersburg Lake in the late fall. This information will be very useful in formulating sound management policies for sea-run cutthroat populations.

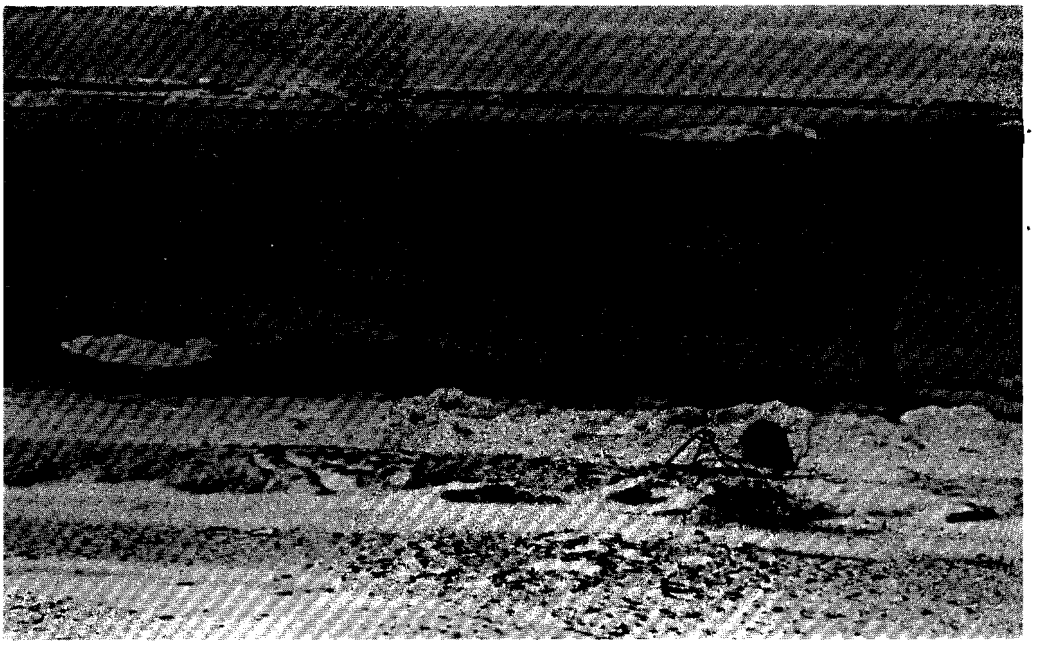
OTHER PROJECTS

MENDENHALL LAKES SALMON REARING STUDIES

A total of 4,451 adult coho returned to the Mendenhall rearing facility in the fall of 1975 -- a return of 5.5 per cent from a 1974 release of 81,425 (1972 brood) coho smolts raised at the facility. An additional 614 jack coho brought the total return to 6.2 per cent. Jack returns from 1973 brood coho released in the spring of 1975 numbered 644.

From May 5 through 10, Moose Lake was pumped down with the project's high capacity pump for removal and release of rearing fish. A mortality of 95.1 per cent of the 209,485 1973 brood coho in Moose Lake was realized. Factors responsible for this mortality have not been determined. However possible causes may have been small size and poor condition of fish in the lake going into the winter, rapid changes in water temperatures, predation by common mergansers, an undetected pathogen or parasite in the Moose Lake environment.

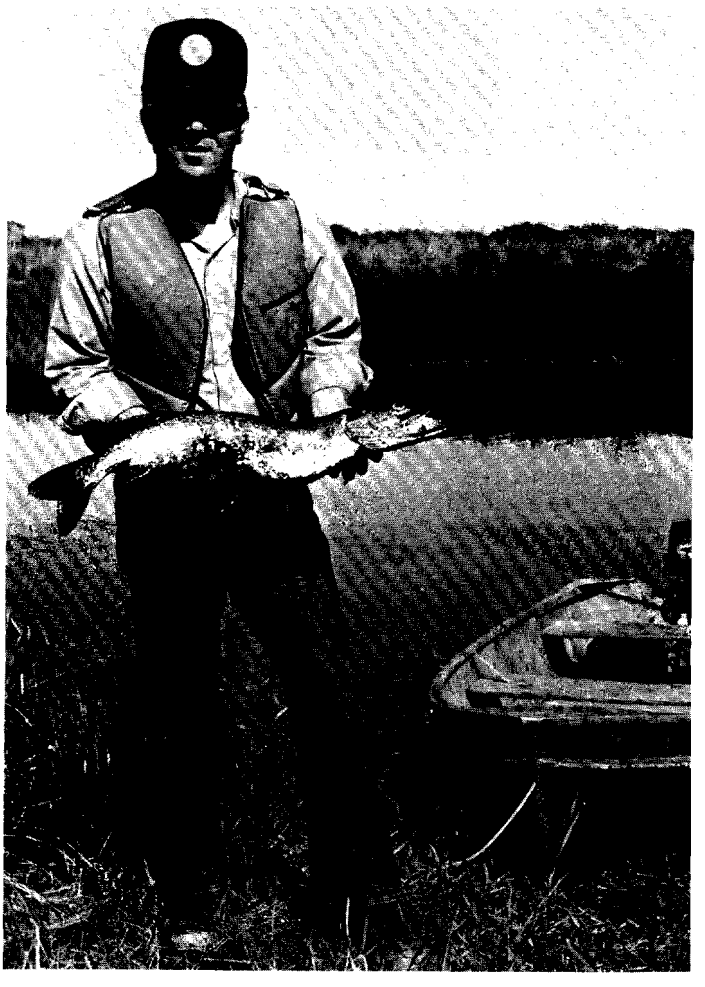
A total of 10,167 coho were removed from Moose Lake. Smolts totaled 3,004 (38 per cent) , 1,296 (33 per cent) of which were fin-clipped before release. An additional 96,479 coho smolts (1973 brood year) raised at Crystal Lake Hatchery were released from the Mendenhall facility from May 5 through June 6, 1975. These fish were marked with an adipose finclip and coded wire tag, or adipose and half dorsal finclip. In all, the total



number of coho smolts released from the Mendenhall rearing facility in the spring of 1975 was 100,383.

On June 24, Moose Lake was restocked with 134,000 coho fry (1974 brood year) at 300 per pound. Two rearing pens stocked with 15,000 fry were used in Moose Lake to test the feasibility of rearing salmon smolts in pens within freshwater lakes.

During the summer, new concrete weirs were built and gabion core dikes installed to improve the facility.



REGION II (SOUTHCENTRAL AND KODIAK)

RUSSIAN RIVER PROJECT

A new weir was fabricated and installed on the Russian River at the outlet of Lower Russian Lake during 1975. A total of 37,610 red salmon were counted as they passed through the facility.

Creel census conducted on the very important Russian River red salmon sport fishery during 1975 revealed a total hafvest of 1,400 and 8,500 red salmon from the early and late runs, respectively. A total of 16,510 man-days of sport fishing were provided by this fishery.

BEAR LAKE-RESURRECTION BAY PROJECT

Analysis of the Resurrection Bay coho sport fishery indicated a record harvest by a relatively moderate effort in 1975. An estimated 22,797 coho were taken by 21,805 man-days of effort for an average catch rate of 3.00 coho per boat, 0.92 coho per angler, and 0.138 coho per hour for the

season. The marked (fin clipped) segment of the harvest, those fish hatchery incubated and stocked by the Sport Fish Division, as smolts in Seward Lagoon, amounted to 5,604 coho, or 24.6 per cent of the total harvest.

LAKE RESEARCH PROGRAM

The lake research program conducted in the Matanuska Valley continued in 1975 with the objectives of assessing different strains of rainbow trout and silver salmon for suitability of management characteristics including stocking, survivability and growth. The first assessments were made in 1975 of the recently developed wild Alaska brood stock and their behavioral characteristics. Preliminary indications are the Alaska stocks compare favorably in the management programs.

EGG TAKES

A total of 4,234,300 eggs were spawned for artificial rearing purposes in Southcentral Alaska during 1975. Most of the eggs taken were coho salmon to be reared for stocking in a variety of Southcentral Alaska waters. Included in the total number were 29,700 rainbow trout from the Kenai Peninsula and 25,300 rainbow from Bristol Bay for continued development of a native Alaskan brood stock.

REHABILITATED WATERS

Three southcentral lakes were chemically rehabilitated to remove undesirable species of fish during 1975. These waters were subsequently restocked with game fish and can be expected to provide improved recreational fishing to Southcentral Alaska sport anglers.

RAZOR CLAM STUDIES

Razor clam harvest and effort data from the east side Cook Inlet beaches during 1975 revealed 24,260 man-days were expended to harvest a total of 896,080 razor clams. Clam Gulch continued to be the most popular clam digging area in the state, receiving 15,710 man-days of effort, and providing an estimated 607,850 razor clams. Harvest per digger was the greatest recorded, averaging 38.1 clams per digger.

KENAI PENINSULA KING SALMON FISHERIES

PUNCHCARD FISHERY:

The 1975 king salmon punch card fishery was conducted during the weekends of May 24-25, May 31-June 1, and June 7-8 on the Anchor River, Deep Creek and Ninilchik River. Angler effort for these streams was estimated at 19,600 man-days, a slight reduction from the 21,000 estimated in 1974.

The total 1975 king salmon harvest from the three streams totaled 850 fish, a 41 per cent increase over the seven year mean of 603.

KENAI RIVER:

A creel census was conducted on the Kenai River, June 3-July 31, from its terminus with Cook Inlet to the Skilak Lake outlet which is the total area open to chinook salmon angling. The total boat harvest of chinook salmon over 20 inches in length was estimated at 2,610 fish taken in a total of 23,830 man-days of sport fishing. A total of 1,150 one-ocean jacks under 20 inches in length were also taken during the season.

SALTWATER FISHERY:

The primary area of marine chinook salmon fishing in the Cook Inlet area occurs from the terminus of Deep Creek with Cook Inlet to a point approximately 20 miles south of this stream. This saltwater fishery occurs with small, car top type boats due to the lack of launching facilities for larger craft. Because of this, weather conditions in Cook Inlet may play as vital a role in determining the success of the fishery as the actual abundance of chinook salmon.

A creel census of completed boat anglers has been conducted annually at the state's Deep Creek campground since 1972. In 1975 the sport harvest was estimated at 880 chinook salmon, captured in a total of 8,050 man-days of recreational angling.

REGION III (INTERIOR AND WESTWARD)

LAKE REHABILITATIONS

During 1975, three small lakes on Ft. Greely, near Delta Junction were rehabilitated with rotenone to remove populations of longnose suckers and slimy sculpin. The three lakes, Nickel, Chet, and "J", have surface areas of three, five and seven acres respectively. All three lakes will be restocked with grayling in 1976.

IMPORTANT FISHERIES

The Chena River continues to be the most heavily utilized sport fishing stream in the Interior. In 1975 a summer-long (June-August) creel census showed 39,200 man-hours of effort and a catch of 26,000 grayling. This usage is down somewhat from 1974, principally because construction on the Chena Hot Springs Road limited access to the upper river for part of the summer, and exceptionally high, dirty water in August made for unfavorable fishing conditions. Quartz Lake was again the most popular stocked lake in the Interior in 1975. A traffic counter placed on the single access road to the lake from mid-May through early October showed a count of 9,537 vehicles. Over 900 vehicles were recorded during Memorial Day weekend alone. Creel census provided an estimate of 57,000 angler hours and a catch of nearly 24,000 rainbow trout during the summer. Excellent catches were also taken during the 1974-75 ice fishing season.

NEW PROGRAMS

EVALUATION OF FISH HABITAT IN THE MIDDLE FORK KOYUKUK RIVER

Under a cooperative agreement with the Joint Fish and Wildlife Advisory Team for Pipeline Monitoring, Region III initiated a study to obtain baseline fisheries data on the Middle Fork of the Koyukuk River and its tributaries affected by pipeline construction. Assessment will also be made of the effects of constructing 29 spur dikes on the Middle Fork. Weirs were installed on tributary streams to determine migration patterns, and work is being done to identify overwintering habitat of fish. Selected streams are also being studied for benthic productivity. These studies will be important for mitigation purposes should construction or oil development activities disrupt these streams or their fisheries.

BEAUFORT SEA NEAR-SHORE FISHERIES STUDY

Contracted under the National Oceanic and Atmospheric Administration, the Sport Fish Division has initiated a fishery study of the nearshore habitats of the Beaufort Sea in the vicinity of oil development. This is one of several interdisciplinary studies administered by the Outer Continental Shelf Energy Program.

Seasonal distribution and abundance of several species of fish within the nearshore environs of the Beaufort Sea, life history information, food habits and special habitat requirements are being investigated. It is hoped that baseline information will be obtained that can be used to influence future development along the arctic coast.

Field studies were initiated during the summer of 1975 and data are presently being analyzed on fourteen species of fish captured during the initial phase of this study. Overwintering fish and their habitat are presently under study utilizing underwater television equipment and test nets.

ONGOING PROGRAMS

INVENTORY AND CATALOGING

Because of its large size, some 400,000 square miles, Region III continues to emphasize inventory and cataloging of sport fish waters. During 1975, six inventory and cataloging projects were active.

Three of these programs were directed toward completing inventory of the Tanana River drainage, and considerable effort was given to waters between Tok and Delta Junction, the Delta River system and the Kantishna River drainage. Inventory and cataloging was also conducted on the North Slope, the Chandalar drainage and a new program was started in Westward Alaska to begin surveys of the lower Kuskokwim River drainage. In all, 60 lakes and 68 streams were surveyed in 1975.

FISHERY RESOURCES INVESTIGATION OF LOWER KUSKOKWIM RIVER AND KUSKOKWIM BAY

A two year fisheries resources investigation of lakes and streams of the Lower Kuskokwim River and Kuskokwim Bay was initiated in 1975. These rivers and lakes have not been studied except for aerial salmon counts by the Division of Commercial Fish. The lakes and streams in the survey area have good populations of sport fish and thus have high potential.

Rainbow trout are found in the Aniak, Kisaralik, Tuluksak, Kasiglik, Kweethluk, Arolik, Goodnews and Kanektok rivers, and this is apparently the most sought-after game species. The largest rainbow taken during 1975 surveys weighed 6½ lbs.

Lake trout and Dolly Varden char were found in all lakes surveyed in 1975, but grayling were found only in rivers. All five species of salmon are found in the study area. King salmon and silver salmon are the most important sport species.

Large red salmon (over 10 pounds) are present in Goodnews Lake and furnish excellent sport fishing.

Northern pike and sheefish as well as humpback and broad whitefish and least and Bering ciscoes are found only in the streams draining into the Kuskokwim River.

STUDY OF A TYPICAL SPRING-FED STREAM OF INTERIOR ALASKA

Now in its third year, this study of the complex factors at work in a spring-fed stream, the Delta-Clearwater River, is presently attempting to increase numbers of grayling which experience a heavy summer fishery. In 1975, grayling fry were planted in shallow ponds on nearby Ft. Greely. The grayling attained a length of 4.5 inches and averaged 32 per pound at the end of three months. Over 9,000 of these fish were transferred to spring areas in the Delta Clearwater. This technique will be continued and its usefulness as an enhancement method evaluated.

DISTRIBUTION, ABUNDANCE AND NATURAL HISTORY OF ARCTIC GRAYLING IN THE TANANA RIVER DRAINAGE.

During 1975, work continued on evaluation of various capture methods of grayling. Growth and survival of grayling captured with AC electrofishing gear was compared to other capture methods, and initial work on perfecting a boat-mounted DC shocker was begun.

The main emphasis in the past year has been identifying overwintering locations and movements in the Chena River. Grayling were found to overwinter at various locations in the river at least as far upstream as river mile 94. No outmigration from the Chena could be detected. A weir installed through the ice on a tributary of the Chena was successful in determining under-ice movements in the early spring.

Work continued to study the Chena in relation to the flood control dam being constructed and considerable effort was placed on assuring that adequate fish passage facilities would be built into the project.

A budget reduction imposed in the fall of 1975 necessitated termination of this project.

STATEWIDE SPORT SALMON HARVESTS

A primary goal of the Sport Fish Division is "to protect Alaska's recreational fishery resources through a well regulated harvest." It is doubtful that this goal can be realized without adequate estimates of statewide sport salmon harvests. Indeed, without these estimates sound statewide management, allocation, regulation, and assessment

of the contribution and future of Alaska's sport salmon resources is improbable.

Although sport salmon harvests are estimated in a number of Alaska's local fisheries and, in some cases, have been since territorial days, before 1973 no effort had been directed toward estimating statewide harvests by recognized scientific procedures. In that year a mail survey indicated anglers caught and kept 53,459 king, 187,949 coho, 141,044 red, 105,839 pink, 27,604 chum, or a total of 515,895 salmon in Alaska.

If accurate, these estimates imply a harvest of over four million pounds, 2.6 million processed pounds. This represents 270 tons of protein and $4.7 million in canned wholesale values. Perhaps most impressive, anglers who actually caught salmon spent an estimated $32 million -- this figure is also derived from the 1973 mail survey -- on license fees, angling gear, boats and related expenses, food and beverages, transportation and lodging. Thus cost to them of their salmon was over $12 per pound or $62 per fish. Of course, estimated cost per pound and per fish would have been even higher had expenditures by unsuccessful salmon anglers been available for inclusion in calculations.

The problem is that these estimates are probably high. There is evidence that some commercial and subsistence harvests were included in estimates; there is also evidence that respondents to the mail survey caught more salmon than did nonrespondents; and research in both Alaska and other states has shown false reporting of catch often occurs in surveys of this type. All these factors would inflate estimates. Furthermore, because the 1973 Alaska survey was designed primarily to estimate economic characteristics of sport fishing, no validity comparisons with known harvests in localized fisheries were built in. Thus the degree of overestimation is not ascertainable. For these reasons estimates given here should be treated with caution.

The division recognizes the need for and importance of Alaska recreational salmon harvest estimates, and has now undertaken projects directed specifically at obtaining not only statewide harvests but estimates of both harvest and effort by management-regulatory areas. We hope to report these estimates for 1975, and every year thereafter, without qualification.

DEPARTMENT OF FISH AND GAME

1975-76 Budget Authorization

Administration (includes Vessels)	$ 3,216,900
Hatchery Services	924,700
Habitat	1,139,200
Commercial Fisheries	6,215,500
Game	4,174,900
Sport Fisheries	2,752,200
Alaska King Crab Marketing & Quality Control Board	202,800
Fisheries Rehabilitation, Enhancement & Development	2,587,400
Pipeline Monitoring	905,200
DEPARTMENT TOTAL	$22,118,800

ALASKA SPORT SALMON HARVEST AND VALUES, 1973

Species	Harvest	Average Weight (Pounds)	Total Round Weight (Pounds)	Total Processed Weight * (Pounds)	Percentage Protein**	Total Protein (Pounds)	Wholesale Prices (Canned) Dollars (Per Pound)	Value (Dollars)
King salmon	53,459	20.0	1,069,180	694,967	19.6	136,214	1.79	1,243,991
Coho salmon	187,949	7.5	1,409,618	916,252	20.8	190,580	1.91	1,750,041
Red salmon	141,044	7.0	987,308	641,750	20.3	130,275	1.91	1,225,743
Pink salmon	105,839	3.5	370,437	240,784	20.5	49,361	1.39	334,690
Chum salmon	27,604	8.5	234,634	152,512	21.5	32,790	1.16	176,914
Total	515,895	-	4,071,177	2,646,265	-	539,220	-	4,731,379

* 65 per cent of round weight

** From *Composition of Foods*, Agriculture Handbook No. 8, United States Department of Agriculture

STATEWIDE SPORT FISH STOCKING:

Fish Stocked, by Species during 1975

Region I		Region II		Region III	
Fish Species	Number	Fish Species	Number	Fish Species	Number
Steelhead	9,000	Rainbow	374,366	Rainbow	227,000
Silver salmon	177,557	Silver salmon	1, 406,311	Silver salmon	503,000
		King salmon	40,900	Grayling	550,000

SUMMARY OF HATCHERY FISH AND EGGS STOCKED AND TRANSFERRED DURING 1975

	Fire Lake-Ft. Rich.-Elmendorf Hatchery Complex		Crystal Lake Hatchery		Kitoi Bay Hatchery		Total	
Species	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Silver Salmon	2,055,000 609,000	25,700 eggs	1,440,000 3,080,000	41,914 eggs	0 0	0 0	3,495,000 3,689,000	67,614 eggs
King Salmon	91,000	5,100	65,000	973	0	0	156,000	6,073
Red Salmon	0	0	0	0	32,000	fry	32,000	fry
Pink Salmon	0	0	0	0	2,466,000	eggs/fry	2,466,000	eggs/fry
Rainbow Trout	597,000	25,206	50,000	59	0	0	647,000	25,265
Grayling	1,104,000	sac-fry	0	0	0	0	1,104,000	sac-fry
Steelhead	0	0	18,000	646	0	0	18,000	646
TOTAL	4,456,000	56,006	4,653,000	43,592	2,498,000	eggs/fry	11,607,000	99,598

SUMMARY OF FISH ON HAND, DEC. 31, 1975

	Fire Lake-Ft. Rich.-Elmendorf Hatchery Complex		Crystal Lake Hatchery		Kitoi Bay Hatchery		Total	
Species	Number	Pounds	Number	Pounds	Number	Pounds	Number	Pounds
Silver Salmon	248,000 2,631,000	4,089 eggs	0 0	0 0	375,000 3,670,000	14,000 eggs	623,000 6,301,000	18,089 eggs
King Salmon	232,000	781	25,000	sac–fry	35,000	20	292,000	801
Pink Salmon	0	0	3,315,000	sac–fry	0	0	3,315,000	sac–fry
Rainbow Trout	86,000 1,912,000	12,467 eggs	0 0	0 0	0 0	0 0	86,000 1,912,000	12,467 eggs
Steelhead Trout	0	0	0	0	30,000	300	30,000	300
Red Salmon	0	0	200,000	fry	0	0	200,000	fry
TOTAL	5,109,000	17,337	3,540,000	fry	4,110,000	14,320	12,759,000	31,657

DISPOSITION OF FISH AND EGGS IN 1975

Hatchery	Lakes/Streams	Salt Water Rearing	Controlled Pond/ Lake Rearing	Other Rearing/ Incubation	On Hand	Total
Fire Lake-Ft. Rich.-Elmendorf HatcheryComplex	2,884,000	512,000	450,000	610,000	5,109,000	9,565,000
Kitoi Bay Hatchery	1,226,000	1,239,000	0	32,000	3,540,000	6,037,000
Crystal Lake Hatchery	1,549,000	1,321,000	280,000	1,503,000	4,110,000	8,763,000
TOTAL	5,659,000	3,072,000	730,000	2,145,000	12,759,000	24,365,000

GROSS SPORT FISH AND GAME LICENSE RECEIPTS 1966 THROUGH 1975
PREPARED JANUARY 2, 1976

STATE OF ALASKA, DEPT. REVENUE
FISH & GAME LICENSES
240 S. FRANKLIN, JUNEAU, AK

TYPE OF LICENSE	1966 $	1967 $	1968 $	1969 $	1970 $	1971 $	1972 $	1973 $	1974 $	1975 $
R-Fishing	142,450	143,095	167,555	177,905	197,210	202,515	220,695	239,415	252,965	272,805
R-Hunting	126,805	119,476	135,366	146,475	155,036	150,171	139,699	167,125	137,893	113,435
R-Hunt-Trap	8,380	7,320	7,280	9,090	10,420	8,540	8,420	10,590	11,090	11,810
R-Hunt-Fish	179,016	182,712	210,252	227,328	275,412	308,232	331,500	359,244	388,728	417,348
R-Hunt-Fish-Trap	33,225	32,340	35,850	44,025	59,325	62,505	65,805	80,145	93,585	113,265
NR-10-Day Fish	44,735	57,770	70,155	82,495	86,935	88,310	97,430	221,660	217,020	242,280
NR-Fishing	106,390	132,200	158,200	175,530	207,900	184,050	192,690	287,480	320,180	399,060
NR-Hunting	51,160	58,930	68,150	78,170	90,040	80,330	80,670	141,320	132,720	108,740
NR-Hunt-Fish	33,400	36,400	47,400	54,500	70,120	69,520	71,840	65,560	67,200	65,600
NR-Hunt-Trap	900	400	1,400	1,800	900	1,600	1,000	4,600	4,800	5,200
Reg. & Master Guides	13,850	16,600	17,950	17,250	17,300	17,600	18,950	11,650	-0-	-0-
Ass't. Guides	770	1,195	1,945	2,215	2,290	2,775	2,475	330	-0-	-0-
R. Fur Dealer-Taxid.	2,460	2,580	2,740	3,020	3,180	3,320	3,420	-0-	-0-	-0-
NR. Fur Dealer-Taxid.	700	700	600	1,000	1,300	700	600	-0-	-0-	-0-
Fur-Fish-Game Farm	35	50	35	40	80	105	90	400	500	100
Class "A" Ass't Guide	-0-	-0-	-0-	-0-	520	650	790	180	-0-	-0-
Duplicate License	-0-	-0-	-0-	-0-	-0-	-0-	2,308	3,074	3,222	2,974
R. Fur Dealer	-0-	-0-	-0-	-0-	-0-	-0-	-0-	2,520	2,720	2,420
NR. Fur Dealer	-0-	-0-	-0-	-0-	-0-	-0-	-0-	200	300	400
R. Taxidermist	-0-	-0-	-0-	-0-	-0-	-0-	-0-	2,700	2,100	1,800
NR. Taxidermist	-0-	-0-	-0-	-0-	-0-	-0-	-0-	450	-0-	300
R. Blind Spt. Fish.	-0-	2	3	1	4	1	1	2	3	5
R-25¢ Hunt-Fish-Trap	1,166	1,088	1,229	1,271	1,339	1,398	1,484	1,664	1,564	1,251
R-Trap only	2,058	1,374	1,988	2,571	2,445	2,016	2,466	3,411	2,670	2,277
SUBTOTAL	747,500	794,232	928,098	1,024,686	1,181,756	1,184,338	1,242,333	1,603,720	1,639,260	1,761,070
BIG GAME TAGS	290,545	303,510	346,350	384,975	424,415	393,840	404,410	753,625	744,950	617,025
TOTAL	1,038,045	1,097,742	1,274,448	1,409,661	1,606,171	1,578,178	1,646,743	2,357,345	2,384,210	2,378,095
NUMBER SOLD EACH YEAR BY CLASS										
R-Fishing	28,490	28,619	33,511	35,581	39,442	40,503	44,139	47,883	50,593	54,561
R-Hunting	18,115	17,068	19,338	20,925	22,148	21,453	19,957	23,875	19,699	16,205
R-Hunt-Trap	838	732	728	909	1,042	854	842	1,059	1,109	1,181
R-Hunt-Fish	14,918	15,226	17,521	18,944	22,951	25,686	27,625	29,937	32,394	34,779
R-Hunt-Fish-Trap	2,215	2,156	2,390	2,935	3,955	4,167	4,387	5,343	6,239	7,551
NR-10-Day Fish	8,947	11,554	14,031	16,499	17,387	17,662	19,486	22,166	21,702	24,228
NR-Fish	10,639	13,220	15,820	17,553	20,790	18,405	19,269	14,374	16,009	19,953
NR-Hunt	5,116	5,893	6,815	7,817	9,004	8,033	8,067	7,066	6,636	5,437
NR-Hunt-Fish	1,670	1,820	2,370	2,725	3,506	3,476	3,592	1,639	1,680	1,640
NR-Hunt-Trap	9	4	14	18	9	16	10	23	24	26
Reg. & Master Guides	277	332	359	345	346	352	379	233	-0-	-0-
Ass't. Guides	154	239	389	443	458	555	495	66	-0-	-0-
R. Fur Dealer-Taxid.	123	129	137	151	159	166	171	-0-	-0-	-0-
NR. Fur Dealer-Taxid.	7	7	6	10	13	7	6	-0-	-0-	-0-
Fur-Fish-Game Farms	7	10	7	8	16	21	18	4	5	1
Class "A" Ass't Guides	-0-	-0-	-0-	-0-	52	65	79	18	-0-	-0-
Duplicate License	-0-	-0-	-0-	-0-	-0-	-0-	1,154	1,537	1,611	1,487
R. Fur Dealer	-0-	-0-	-0-	-0-	-0-	-0-	-0-	126	136	121
NR. Fur Dealer	-0-	-0-	-0-	-0-	-0-	-0-	-0-	2	3	4
R. Taxidermist	-0-	-0-	-0-	-0-	-0-	-0-	-0-	54	42	36
NR. Taxidermist	-0-	-0-	-0-	-0-	-0-	-0-	-0-	3	-0-	2
R. Blind Spt. Fish	-0-	2	3	1	4	1	1	2	3	5
R-25¢ Hunt-Fish-Trap	4,664	4,354	4,919	5,085	5,359	5,595	5,936	6,658	6,256	5,004
R. Trap Only	686	458	638	857	815	672	822	1,137	890	759
Big Game Tags	7,597	8,640	9,814	11,055	12,602	11,955	11,866	8,339	8,331	6,956
TOTAL	104,472	110,463	128,810	141,861	160,058	159,644	168,301	171,544	173,362	179,936

COMMERCIAL FISH

NUMBER OF LICENSES SOLD
1966 - 1975

TYPE OF LICENSE	1966	1967	1968 RESTRICTED SALMON NET	1969 MORATORIUM POSSIBLE RESTRICTED SALMON NET	1970 ANTICIPATED RESTRICTION NET GEAR	1971 GEAR ELIGIBILITY REQUIREMENT REMOVED	1972 REGISTRATION IN AREA	1973 BRISTOL BAY SLIDING GEAR SCALE	1974 LEC INTERIM-USE PERMIT REQUIRED	1975 PERMITS REQUIRED
VESSEL	9,370	9,639	9,926	9,972	10,877	10,710	10,791	11,777	11,338	11,630
TROLL LINE	1,944	1,889	2,103	2,303	2,567	2,353	2,413	3,190	3,238	2,810
LONG LINE	733	556	342	700	1,109	1,074	1,221	1,918	1,503	1,393
DRIFT GILL NET	3,654	3,765	4,050	4,374	4,710	4,779	4,611	6,425	4,248	4,511
SET GILL NET	2,845	2,610	2,708	3,011	3,053	3,062	3,112	3,504	3,137	3,139
BEACH SEINE	40	38	38	64	77	86	81	91	76	30
PURSE SEINE	1,236	1,202	1,291	1,207	1,311	1,323	1,147	1,341	1,372	1,265
BEAM TRAWL	19	24	18	13	13	16	32	54	79	57
OTTER TRAWL	17	38	26	30	41	67	87	106	167	172
SHELLFISH POTS	425	474	524	593	617	576	605	959	1,170	936
CLAM DIGGER'S	102	127	148	135	149	237	336	356	262	168
RES. COMMERCIAL	12,565	12,236	14,872	12,609	14,370	14,176	14,369	16,625	15,699	16,064
NONRES. COMMERCIAL	6,847	5,936	6,487	6,318	7,718	6,388	6,761	6,396	5,601	5,796
SCALLOP DREDGE	0	0	0	18	8	7	5	5	7	6
TOTAL	39,797	38,534	42,533	41,347	46,620	44,854	45,571	52,747	47,897	47,977

COMPARATIVE 1973, 1974 AND
1975 SHELLFISH HARVEST
WESTWARD REGION

	1973	1974	1975
SHRIMP			
Kodiak	70.5	48.8	46.9
Chignik	24.9	21.8	25.5
South Peninsula	18.5	25.5	20.0
Unalaska	.5	5.7	.4
Total	114.4	101.8	92.8
KING CRAB			
Kodiak	14.4	23.4	24.0
Chignik	.7	.1	.1
South Peninsula	4.1	4.5	2.3
Unalaska	12.8	13.0	14.7
Bering Sea	28.1	49.4	52.1
Adak-West Aleutians	10.7	1.3	2.8
Total	70.8	91.7	96.0
RAZOR CLAMS			
Kodiak	.2	.2	.1

	1973	1974	1975
DUNGENESS CRAB			
Kodiak	2.1	.7	.7
South Peninsula	.1	.0	.0
Unalaska	.0	.1	.4
Total	2.2	.8	1.1
SCALLOPS			
Kodiak	9.4	1.5	2.9
TANNER CRAB			
Kodiak	31.5	25.5	17.5
Chignik	.7	4.1	3.5
South Peninsula	5.6	8.3	5.3
Bering Sea	.3	5.0	7.0
Unalaska	.1	.6	.1
Adak	.1	.2	.0
Total	38.3	43.7	33.4

	1973	1974	1975
Grand Total Westward Region Shellfish	235.3	239.7	226.3