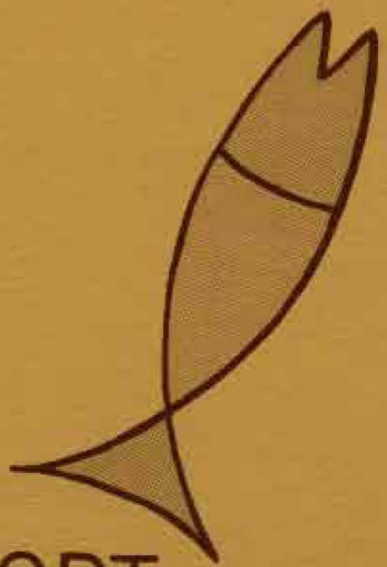
ALASKA DEPARTMENT OF FISH AND GAME



1973

ANNUAL REPORT

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

WILLIAM A. EGAN, GOVERNOR

OFFICE OF THE COMMISSIONER / SUBPORT BUILDING
JUNEAU 99801

March 19, 1974

The Honorable William A. Egan
Governor of Alaska
Pouch A
Juneau, Alaska 99801

Dear Governor Egan:

We are pleased to submit this summary of Department of Fish and Game activities in 1973.

This report provides information on the accomplishments, purpose and duties for each division of the department.

Sincerely,

James W. Brooks

James W. Brooks
Commissioner

1973 ANNUAL REPORT

ALASKA DEPARTMENT of FISH and GAME

James W. Brooks
Commissioner

prepared by

Information and Education Section
Alaska Department of Fish and Game

Table of Contents

Administration Division

I. PURPOSE AND DUTIES:

The Division of Administration acts as business manager for the Department of Fish and Game. It also provides centralized services of accounting, personnel, supply, data processing, central mail room, warehousing, records storage, budget counseling and monitoring as well as administrative guidance at regional offices. The Director of Administration also has responsibility for operation and maintenance of department-owned vessels.

II. ACCOMPLISHMENTS:

The Division of Administration accomplishments tend to be in the area of improving the quality of services furnished and improving the efficiency of operations.

The director's office issued a completely new edition of the departmental S.O.P. manual. This new edition condensed, simplified and re-arranged material to make the manual smaller and easier to use.

A new position of program budget analyst was established in order to assist the department in complying with the requirements of the Executive Budget Act.

The Accounting Section implemented revised procedures in processing accounts payable which resulted in cutting delay in paying bills in half, as well as reducing the personnel required. In transacting department business, 9,500 field warrants were issued, 2,860 travel claims processed, 5,986 disbursement vouchers prepared and processed. Expenditures, exclud-

ing personal services, amounted to $7,188,933.83. Additionally, claims were prepared and processed for over $ 3.5 million in federal reimbursements.

The Supply Section in the last year has concentrated on improving the accuracy of the department's inventory records. Transactions involved in this process included routine transfers, new acquisitions, excess and surveys, as well as corrections to more clearly describe items on computer printouts. The number of corrections to computer printouts totaled 1,844 including 539 additions. Departmental inventory records presently cover some 4,000 items valued in excess of $3 million.

Last year the mailroom processed approximately 170,000 pieces of mail, an increase of 61,000 pieces over the previous year.

Purchasing activity remained near the same level as last year with 428 purchase requisitions and 219 direct purchasing documents being processed.

The Personnel Section maintained personnel records on an average of 400 permanent and up to 300 temporary employees. In doing so, some 130 reclasses or promotions were processed, 18 new positions established, 7 lay-offs and approximately 800 appointments or separations processed. These actions, together with routine corrections to employee records, accounted for processing of approximately 1,300 personnel action forms.

A trial program in which professional personnel services were furnished by the Division of Personnel rather than the Department of Fish and Game was inaugurated in 1973.

The Statistics Section during 1973 concentrated on improving the quality of services furnished. Improvements in existing systems resulted in savings of 129 man days required to run these systems, as well as saving an estimated $6,000 in computer time. The section compiled, printed and distributed 1,400 copies of a total of three formal publications and 23,000 copies of monthly and weekly catch reports. In support of department activities, the section produced over 750 computer printed reports requiring the processing of approximately 390,000 source documents. In addition, considerable progress was made in re-organizing the section and redefining objectives, while streamlining procedures to maximize benefits available from existing resources.

The Vessels Section maintained and operated vessels in support of department programs a total of 1,326 days. In doing so, they ran in excess of 62,000 miles. By far the biggest user of vessel support was the Division of Commercial Fisheries with F.R.E.D. and Protection ranking second and third.

Although plagued with a series of unfortunate incidents including mechanical problems and grounding, the section still provided use and cost rates comparable to previous years despite ever increasing inflation.

Major upgrading was begun on two department vessels during the year. For the first time, a department vessel smaller than the 91-foot "Resolution" made an enforcement patrol west of the Kodiak area. ■

Engineering Section

I. PURPOSE AND DUTIES:

The Engineering Section provides technical and professional engineering consultation and service to the biologists in resource management and research activities.

II. ACCOMPLISHMENTS:

The pressure to come on-line quickly in 1973 with several saltwater fish rearing units and with a gravel fish egg incubation system forced the department's Engineering Section into a total force account mode of operations and activities during the summer and autumn seasons. Project plans and specifications for 1974, and onward, are thus seriously behind normal scheduling.

Technical and professional engineering consultations with department administrators and resources managers were provided on 901 items. This activity is probably the most important service provided by the limited staff of engineers to the many biologists in the department and should be expanded greatly in relationship to other activities.

Completed capital improvement projects and facilities included: Frazer Lake fish ladder modifications (Kodiak Island); Kitoi Station gravel incubation unit (Afognak Island); Packers Lake outlet control structure (Cook Inlet); and the Mendenhall fish rearing ponds (Juneau).

Capital improvement projects under construction at year's end involve: Starrigavin saltwater fish rearing facility (Sitka); Halibut Lagoon estuarine fish rearing system (Homer); and the Crooked Creek gravel fish egg incubation facility (Kenai Peninsula).

Plans and specifications are substantially completed preparatory to going to bid call on several items including: Mendenhall fish rearing complex completion; Pavlof Harbor fish ladder (Chichagof Island); Deadman Lake outlet weir (Northway); Akalura Lake outlet

control structure (Kodiak Island); Lower Jean Lake outlet control structure (Kenai Peninsula); Klakas fishladder (P.W. Island); and the Control Creek fishladder (P.W.S.).

Site surveys and investigations have been made and plans and specifications are being developed for Birch Lake screen, Lower Russian Lake weir, Chignik weir, Russian River fishladder, Lake Nunavaugaluk fish production system, Crooked Creek incubation system expansion, Big Lake incubation system, George Inlet incubation system, Auke Bay saltwater rearing facility, Pauls Lake drainage fishladder modifications, and Fairbanks headquarters building connection to city utilities. All of these items have been authorized and funded for construction.

Inspections and reconnaissance surveys have been made with reports made or presently under preparation for Nancy Lakes water controls (with the state parks division), Deska River weir, Chester Creek rehabilitation, sonar counting facilities, Halibut Lagoon estuarine rearing system expansion, Humpy Creek incubation facility, Hidden Lake production system, Sakha River rehabilitation, Abercrombie Lake beach protection and Starrigavin rearing system expansion. ■

Habitat Section

I. PURPOSE AND DUTIES:

The major objective of the Habitat Section is to minimize detrimental impacts of land and water use activities upon fish and wildlife habitat in Alaska by coordinating the department's involvement in environmental quality programs. The Habitat Section is the only unit of state government that provides fish and wildlife data and requirements during the crucial early stages of developmental planning. Additionally, the Habitat Section executes three of the department's statutory responsibilities. It also supervises the department's review of permit requests from other state and federal agencies.

II. ACCOMPLISHMENTS:

The primary accomplishment of the section was the continuing coordination of intra-departmental responses to applications and proposals from both individuals and agencies for developmental projects that affect fish and wildlife resources and their habitat. Some projects of a larger nature were coordinated with other state agencies to permit a consolidated state position.

The Habitat Section is divided into four major components. The following is a brief summary of each component's major accomplishments for 1973:

Lands Protection:

Because of the far-reaching effects of the land planning aspects of the Alaska Native Claims Settlement Act (ANCSA) upon the future of Alaska's wildlife resources, the section continued to participate as the department's representative on the resource planning team of the Joint Federal-State Land Use Planning Commission. Considerable efforts were extended in providing text, maps and lengthy back-up data for the Land Use Planning Commission. Substantial time was also spent editing the commission's hearing brochures regarding specific "d(2)" areas and the "Ecosystem Map of Alaska."

The section coordinated department involvement with the Bureau of Outdoor Recreation (BOR) and participated in field surveys of potential wild and scenic rivers throughout the

state. Needed data were supplied and subsequent BOR wild and scenic river reports were reviewed. Similarly, considerable time was expended coordinating comments regarding several National Park Service "statement of existing environment" portions of specific "d(2)" lands proposals.

Since passage of the National Environmental Policy Act of 1969 (P.L. 91-190), the requirements for fish and wildlife input to environmental impact statements (EIS) for "major federal actions" has increased at a phenomenal rate. The Habitat Section has assumed this responsibility for the Department of Fish and Game. In addition to reviewing EISs from authoring agencies, often in several draft forms, the section has written, or closely assisted in the writing of several EISs for Department of Highways construction projects (e.g. Copper River Highway). The section wrote and reviewed a total of 57 EISs during 1973.

The section continued to administer the 1,700-acre Fairbanks Wildlife Management Area (FWMA) essentially located in the heart of Fairbanks. The Fairbanks North Star Borough Planning Commission heeded the section's recommendation for deletion of proposed roads through the FWMA as suggested in a land plan prepared for the borough by a consultant. Similarly, the section worked closely with planners from the city-borough of Juneau in developing a controlled land-use development plan for the Gastineau-Mendenhall wetlands. The Mat-Su Borough Assembly formally adopted the Susitna Flats resource management area plan proposed by the department and the Alaska Division of Lands.

In Southeastern Alaska, the section coordinated a department program to establish, in conjunction with the U.S. Forest Service and Division of Lands officials, the concept of habitat conservancy zones throughout the forests of the area. This planning process has proven to be of valuable assistance in the decision making process of the land-holding agencies.

Projects Review:

The following table summarizes both the Habitat Section's statutory permit activity and its required input to similar activities of other agencies for the 1973 fiscal year:

Agency	
Federal:	
Corps of Engineers	181
U.S. Coast Guard	4
U.S. Geological Survey	21
State:	
Dept. Natural Resources	
Seismic	23
Drilling	27
Water Use	169
Gravel Removal	61
Timber Sales	27
Mining	46
Tidelands	69
Dept. of Highways	
Highways	33
Div. of Aviation	
Airports	12
State Clearinghouse	
Parks	22
Sewer and Water	11
ADF&G	
Anadromous Streams	219
Total	925

The Habitat Section continued to exercise the department's Constitutional charge to protect anadromous fish streams. Major emphasis continued to be centered around oil and gas exploration and pipeline associated activities. Considerable time was spent establishing the department's pipeline design review and monitoring functions.

Thus, in addition to the lead role in statutory charges, the Habitat Section acted as the Department of Fish and Game's contact for other agencies charged with regulatory or permitting functions that required deference to fish and game values.

Waters Protection:

A major accomplishment was the updating of the anadromous stream catalog in accordance with the Alaska Administrative Procedures Act. In addition, all streams statewide, excepting the Aleutians, were recorded on EDP cards and several printouts obtained.

The section continued the cataloging of waters in Alaska. These data, in addition to fisheries resource information, were presented to the Land Use Planning Commission. This monumental task marked the first statewide fishery inventory.

Access:

The program to provide access to public waters continued. The following are accomplishments during FY 1973:

Rights-of-way were submitted for 35 trails and one road to the Alaska Division of Lands for public access to fishing waters. One land use permit was requested and obtained for a counting tower on the Talachulitna River. Three interagency land management transfers were requested; one was obtained. Classification of state lands provided access to 41 lakes by reserved use and 72 streams and 185 lakes by resource management classifications.

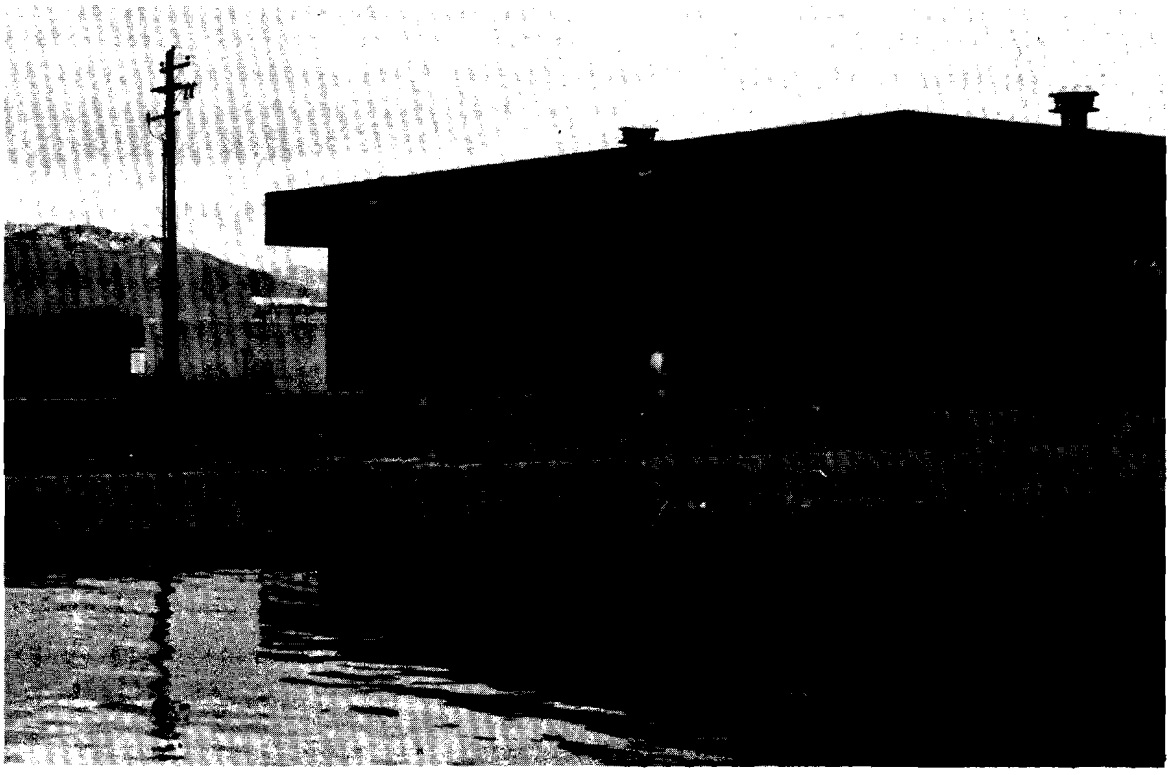
A total of 62 requests for classification as reserved use was submitted to the ADL. Forty-one of these were processed and the remainder are pending.

Three land use permits were submitted to the Bureau of Land Management for public access to lakes.

One R&PP was submitted to the BLM for public access to Pinochle Lake (Matanuska River).

A donation of public access from a private land owner was investigated and pursued. Access to Upper Bonnie Lake and Echo Lake is continuing.

The section initiated the identification of rights-of-way across native selected lands pursuant to Section 17 (b) (1) of ANCSA. ■



Hatchery Services Section

I. PURPOSE AND DUTIES:

Hatchery Services was activated in 1969-70 to implement the $3 million fish hatchery construction bond issue, SLA 1968, Chapter 227 and to consolidate the operations of the department's existing and expanding fish hatchery facilities. The operational functions were assigned to Hatchery Services in July, 1971. Hatchery Services has three basic goals:

1. Completion of the new fish hatchery facilities as funded by the fish hatchery construction statute.
2. Becoming completely operational with the new and existing fish hatchery facilities in a unified operation.
3. Fully utilizing the facilities to provide the Sport Fish Division, Commercial Fisheries Division and Fishery Rehabilitation, Enhancement and Development Division with fish for their expanding needs.

II. ACCOMPLISHMENTS:

Major accomplishments included the completion of the Crystal Lake Hatchery at Petersburg to funded levels. A vigorous year-long headquarters effort was necessary to initiate deficiency corrections by the contractor on several major aspects.

There were several significant "firsts." A cooperative egg take was mounted which resulted in more than four million coho eggs delivered to the hatcheries. It will provide stocks of 100 per cent native eggs at production levels to all projects for the first time. Federal funding from the Anadromous Fish Act was obtained to reinstate $100,000 worth of critical improvements on the water supply and spawning facilities at the Crystal Lake Hatchery. The project has been established and the first improvements are under way.

Production transportation of fish was expanded from Southcentral and the Interior to include Southeastern Alaska. Hatchery Services transported thousands of pounds of fish on the marine highway system in Southeastern Alaska for the first time to projects in Sitka, Ketchikan and Juneau. The first overland trip transporting king salmon smolt and coho fingerling from the Fire

Lake-Fort Richardson complex to the Crystal Lake Hatchery was also made via the Alaska Highway and state ferry.

Production levels attained during 1973 are shown in Table I, which is a summary of fish and eggs stocked and transferred during 1973. The fish and eggs that were still being reared at the end of the year are shown in Table II.

The Fire Lake-Fort Richardson complex completed its first full year at production levels. The cooperative rearing project with the Fort Richardson Army Post reared 41,000 pounds of fish using the waste heat from the base's central steam plant. Salmon, trout, grayling and sheefish were stocked into department projects which included 114 lakes, 3 streams, 1 saltwater rearing site and 1 gravel incubation unit. Fish were transported routinely for stocking to the Westward Region, throughout Southcentral and to the Interior. One transport of salmon was also made by highway and ferry to Southeastern Alaska. Involved were 75 trips by planting truck and 15 air shipments.

Fish losses from bacterial gill disease were reduced from the previous year by developing more effective and continuous treatments for fish reared in the water reuse system. The inadequate water treatment facilities prevented maintaining a disease-free environment, however, and losses were still high.

Aeration improvements were made in the fish transportation equipment and an additional 500-gallon tank was mounted on a trailer and pressed into service. Facilities for fish trapping and spawning at the Ship Creek Chugach Dam were remodeled and improved so that they operated with minimum effort and few problems.

The Crystal Lake Hatchery was completed during the year at the level funded. It started the year with construction in full progress. The 1972 brood coho, king salmon and alevins were being incubated in temporary facilities so that fish would be available as various parts of the station were ready for use. By February, we had taken beneficial occupancy and the shakedown period commenced. Troubles with various aspects of the new hatchery came from many sources. Fortunately, most major crises were avoided and the initial fish rearing program progressed satisfactorily.

In May the first transfer of reared fish from the Crystal Lake Hatchery was accomplished. A load of 38,000 coho and king salmon fingerling was transported by planting truck aboard the Alaska Marine Highway's M/V Taku to the saltwater rearing pens at Sitka. During the year 1.4 million fry and fingerling were supplied to Sport Fish and FRED projects at Juneau, Sitka and Ketchikan. In the first year's operation, all requests were met. Also, the concept of transporting live fish by liberation truck and tank trailer on board the Alaska ferries has proven to be successful and practical.

This first year the Crystal Lake Hatchery raised 2,206,200 king, coho and rainbow weighing a total of 38,420 pounds. The poundage of fish was reduced to conserve fuel during the early stages of the fuel crisis. The water supply was not heated to stimulate fish growth as planned. Only enough heat was added to the water to prevent freezeup.

The Kitoi Bay Hatchery was fully active in providing hatchery support to FRED gravel incubation projects, department egg takes and other experimental projects. Pink, red and coho salmon egg takes were cooperatively conducted and an unsuccessful attempt was made to take king salmon eggs. One million red, pink and coho fry were reared and released in adjacent waters for FRED and the Sport Fish Division. Both red salmon and pink salmon eggs were also pre-incubated in quantity for FRED gravel incubators.

Standard disease investigative practices revealed that a virus disease was endemic in at least one of the local red salmon stocks. Infectious hemotopoietic necrosis (IHN) has been identified in recent years as a serious disease in Pacific Coast red salmon. It was identified in the local stock for the first time in Alaska. Appropriate measures are being taken to keep the disease isolated.

In the latter part of the year, a small oil slick was found coming from the ground in the estuary of Big Kitoi Creek. The source could only have been the Kitoi Bay fuel oil storage and supply facilities, so emergency measures were taken to obtain new tanks and supply lines. In the meantime, "Sorb-Oil" booms and other adsorbatives were used to prevent slicks from recurring. The problem was solved and no further losses of oil have been found.

HATCHERY SERVICES

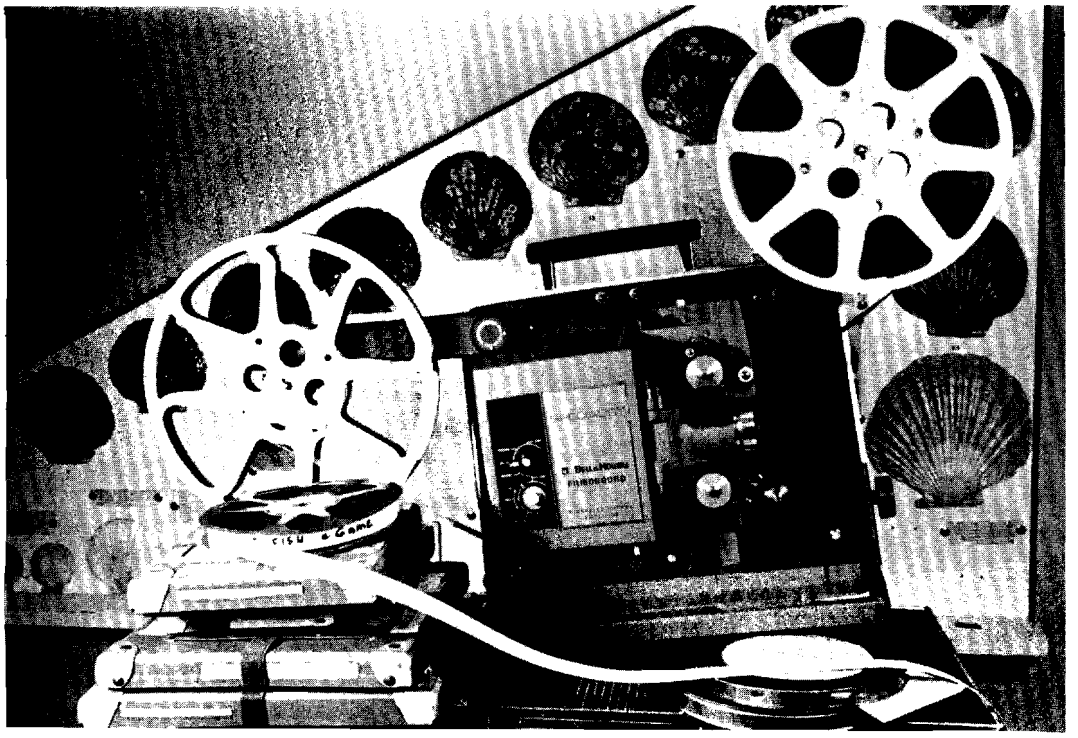
TABLE I – SUMMARY OF FISH AND EGGS STOCKED AND TRANSFERRED DURING 1973.

	Kitoi Bay Hatchery		Fire Lake-Fort Rich. Hatchery Complex		Crystal Lake Hatchery		TOTAL	
Species	No.	Lbs.	No.	Lbs.	No.	Lbs.	No.	Lbs.
Silver Salmon	177,000		1,744,000	16,517	1,099,732	6,705	3,020,732	23,222
King Salmon			165,200	10,383	259,797	5,857	424,997	16,240
Red Salmon	318,421		192,000	eyed eggs			510,421	eyed eggs
Pink Salmon	493,200						493,200	
Rainbow			1,268,100	24,452			1,268,100	24,452
Grayling			662,600	fry			662,600	fry
Sheefish			166,400	fry			166,400	fry
Totals	988,621		4,198,300	51,352	1,359,529	12,562	6,546,450	63,914

HATCHERY SERVICES

TABLE II – SUMMARY OF FISH ON HAND ON DEC. 31, 1973.

Species	Fire Lake-Fort Rich. Hatchery Complex		Kitoi Bay Hatchery		Crystal Lake Hatchery	
	Number	Pounds	Number	Pounds	Number	Pounds
Coho Salmon	1,215,000	6,100	998,000	eggs	2,439,000	8,100
King Salmon	238,000	1,400	-	-	422,000	17,500
Red Salmon	1,151,000	eggs	1,410,000	eggs	-	-
Pink Salmon	-	-	521,000	eggs	-	-
Rainbow Trout	364,000	3,300	-	-	27,000	300
TOTAL	2,968,000	10,800	2,929,000	eggs	2,888,000	25,900



Information & Education Section

I. PURPOSE AND DUTIES:

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

This is accomplished through informational and educational programs which include news releases, films distributed throughout the state, a weekly television program, radio programs, a magazine, pamphlets, exhibits, photo displays and personal appearances. The Section answers more than 5,000 letters per year from persons seeking information about Alaska's fish and game.

II. ACCOMPLISHMENTS:

New requests for the Department magazine, "Fish Tales, Game Trails," average about 100 per month and by the end of the year the press run had reached 7,500, up 1,500 from the 1972 figure.

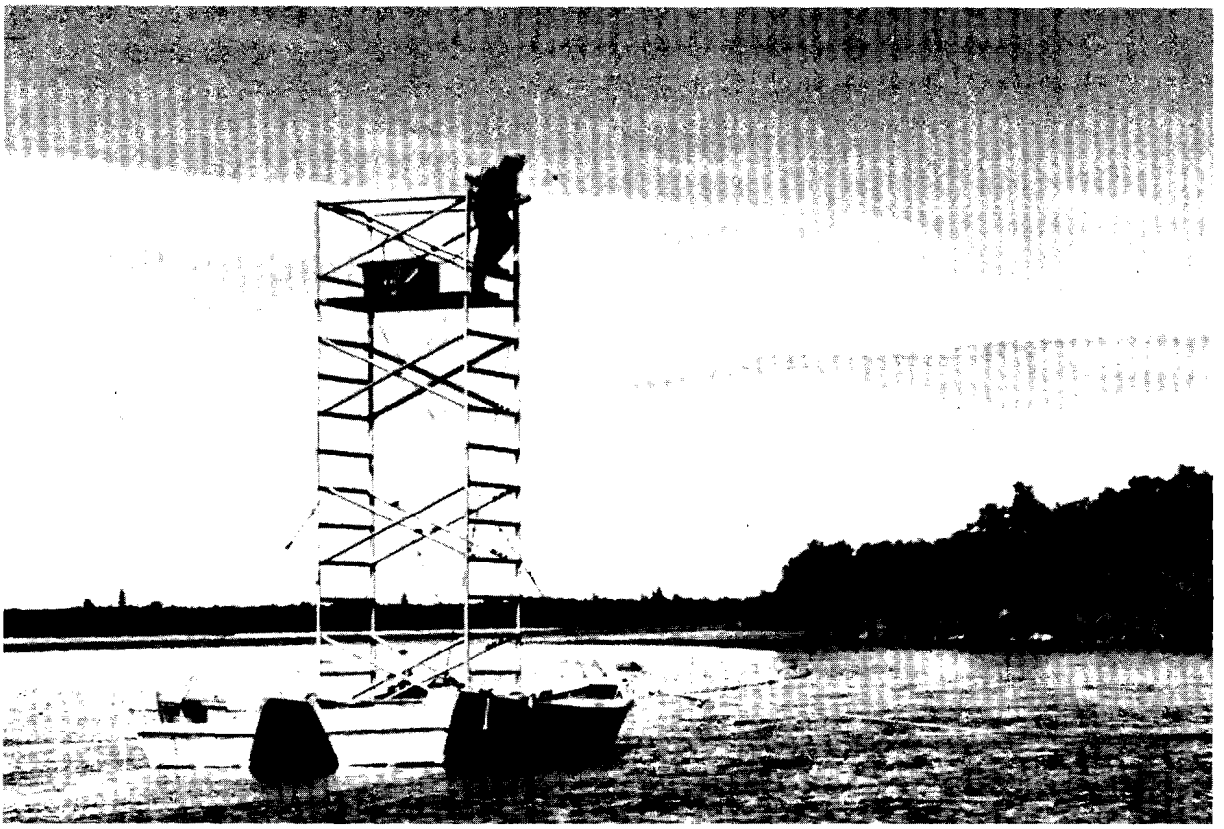
The Section's film library circulated approximately 1,700 film copies to schools, service clubs and other organizations throughout the state. Film circulation showed a dramatic increase over 1972 when about 900 films were distributed. One new film, "Sheefish," was produced in cooperation with the Sport Fish Division during the year.

A daily, one-minute radio program was started in Juneau and efforts continue to add similar programs in other communities throughout the state. The weekly Department television program is seen in Anchorage, Fairbanks, Nome, Kodiak, Wrangell, Petersburg, Sitka, Ketchikan and Juneau.

A highlight of the year was the initiation of the first annual Wildlife Photo Exhibit sponsored by the Department of Fish and Game. From the 60 entries received, 40 were selected for exhibit throughout the state and will be on display in Juneau, Fairbanks, Nome, Bethel, Anchorage, Kodiak, Homer, Sitka and Ketchikan.

The Section produced about 200 news releases, four wildlife notebook series and miscellaneous other information and education projects.

Added emphasis was placed on environmental education activities and plans were made for the Section and the Department to become more active in this field.



Commercial Fisheries Division

I. PURPOSE AND DUTIES:

The Division of Commercial Fisheries is charged with the management, maintenance, and extension of all the important commercial and subsistence fisheries resources of the state except halibut. It is the goal of the Division to promulgate and execute measures to achieve the maximum sustainable yield for each stock of fish.

In this regard, the foremost concern of management is to perpetuate a brood stock sufficiently large to fully utilize the available spawning or rearing habitat, and to permit an orderly harvest of those fish in excess of the number required to perpetuate the population. The primary method of achieving this basic objective of fisheries conservation is through the use of fishery regulations, primarily the control of the time and area where and when a fishery may operate on a stock of fish. The program plan of the Division of Commercial Fisheries is to gather the maximum amount of information on eash fishery to the extent permitted by budget levels so that each fishery may be properly regulated to achieve a harvest while assuring an adequate brood stock.

II. ACCOMPLISHMENTS:

Southeastern Alaska:

Although 1973 was a very disappointing salmon year in Southeastern, this region lead the state in salmon production and provided 35 per cent of the total case pack and 65 per cent of the state's pink salmon production. In terms of frozen and cured pack, it provided nearly half the state's total yield. Exceptionally high prices paid to the fishermen helped compensate for the small catches; but potential income was offset in many cases by the influence of new gear into most of the salmon fisheries. The gillnet fleet was especially hard hit by the invasion of new fishermen which resulted in reduced fishing time during most of the season.

The Southeastern king crab fishery appears to have stabilized into a steady winter fishery for a limited number of boats. Twenty-five vessels produced 823,000 pounds of king crab by the close of the red crab season. At a record price of $.85 per pound, this fishery provided a welcome boost to the winter economy. The growing tanner crab fishery was also a welcome addition to the fall and winter fishing opportunity, producing nearly 1.8 million pounds for the year.

Although dungeness crab stocks appear to remain at a relatively depressed level in most areas of Southeastern, the offshore stocks of the Yakutat district are producing at record levels with over 2.4 million pounds landed.

Shrimp production remains at a low level with effort limited to a small fleet in Petersburg and Wrangell. An improved peeler machine installed in Wrangell will be watched with interest.

Interest in harvesting herring has increased greatly during the year with added fishing effort in both the spring sac roe fishery and more popular winter bait and food herring fishery. Five fillet machines are presently operating in Petersburg, adding much to the winter economy of this active fishing town.

Local utilization of the region's groundfish potential is finally a reality with four vessels trawling for starry flounder and rock fish. A hand filleting line has been established, and the local people seem to be quite adept at processing the tasty bottom fish for Petersburg Fisheries Inc.

The Research Section in Southeastern Alaska made significant advances during the past year. The pink salmon forecast project investigated the effects of harsh ocean conditions on the survival of recent migrant pink salmon fry. It was proved that early ocean survival could be predicted and that the severity of recent winters was a cause of reduced pink salmon runs to Southeastern Alaska.

Studies of optimum escapement and productive potential of streams resulted in recommendations for rehabilitating potentially superior pink salmon streams. Sockeye salmon studies contributed information on geographical separation of Chilkat and Chilkoot stocks within the Lynn Canal gillnet fishery, and provided management with an additional tool. Herring hydroacoustical studies are expanding to provide a basis for establishing catch levels for each stock utilized by this expanding fishery. Cooperative studies with the U.S. Forest Service resulted in environmental impact statements with recommendations for habitat protection in areas scheduled to be logged.

Central Alaska:

In Bristol Bay the 1973 season resulted in the least amount of fishing time and the lowest sockeye salmon catch in history. The total catch amounted to 760,000 sockeye. The total sockeye escapement to all river systems was 1.7 million, 35 per cent of the required 4.8 million. Only the Togiak district received its modest escapement goal of 100,000. The harvests of other salmon species in 1973 totaled only 800,000. The king salmon harvest of 44,000 was the smallest harvest since 1953. Pink salmon were predictably low because Bristol Bay pink salmon are abundant only in even years. The coho harvest of 56,000 was well above the 21-year average of 38,300. The chum salmon catch was 684,000 compared to a 21-year average of 522,000.

The 1973 salmon harvest in Cook Inlet, totaling 2.2 million fish, was above the odd-year average since 1955 of two million. The species composition of the catch was a surprise as pinks and chums, normally predominant in even-years, comprised 65 per cent of the catch. Sockeye, which normally account for over 60 per cent of the catch, contributed only 32 per cent of the 1973 catch. Sockeye escapements in general were fair to average.

The total herring catch for Cook Inlet in 1973 was 1,592 tons with fisheries developing in the Outer and Kamishak districts. A small gill net fishery also developed in the Central district, and biologists are expecting expansion of this fishery in 1974.

Trawl shrimp production was on par with 1972 at five million pounds for the year as was king crab at 4.5 million pounds. Stocks of both species appear to be healthy. Pot-caught shrimp doubled the 1972 production and amounted to 350,000 pounds. This fishery is expected to continue expanding.

Cook Inlet tanner crab production, as in 1972, established another record — approximately nine million pounds, or about twice the 1972 production.

In Prince William Sound, the 1973 seasons produced runs of both pink and chum salmon above forecast levels. The chum run of 1.3 million, the largest return in 10 years, was well distributed and provided a good spawning escapement. Spawning escapements of pink salmon ranged from poor to excellent and were poorly distributed.

The unlimited market for herring sac roe plus a large increase in price for herring resulted in a catch of 6,983 tons in 1973. The herring spawn on kelp harvest totaled 306,000 pounds.

The Prince William Sound tanner crab fishery continued to increase in terms of production, as 12.7 million pounds were landed in 1973 compared to 8.6 million pounds in 1972. Other shellfish fisheries were on par with the 1972 production.

Salmon Forecasts:

The Bristol Bay sockeye run for 1973 was forecasted at 6.4 million, only slightly above the minimum escapement requirements for most districts. Due to the poor forecast a cautious approach was taken in managing the run and very limited fishing time was allowed. The inshore run of 2.4 million was the poorest in history and only limited test fishing was allowed, while escapements were below minimum requirements in all major systems.

The forecasted 1974 Bristol Bay inshore sockeye run of five million is only about 50 per cent of escapement requirements. Preliminary forecasts for 1975 also indicate a run substantially below normal peak-year levels with the prospect of little or no harvest in major districts. These poor runs are apparently due primarily to poor freshwater and marine survival from brood years 1968-1970. It is imperative that maximum protection be given to spawning stocks in 1974 and 1975 to rebuild these depleted runs. Central Region research personnel presented this information to the Japanese government at the International North Pacific Fisheries Commission meeting in an attempt to convince them to modify their high seas fishing pattern to protect Bristol Bay stocks in 1974.

Pink salmon returns to Bristol Bay in 1974 are also forecasted to be below escapement requirements.

The Prince William Sound pink salmon run in 1973 was forecasted to be 2.7 million with a range of 1.1-4.3 million. The actual return was 3.3 million fish of which 1.2 million were allowed to escape. The Prince William Sound chum salmon run was forecasted to be 640,000. The actual return was 1.2 million fish of which 550,000 were allowed to escape. The chum return was one of the largest in recent years. Forecasts for 1974 are two million pink and 200,000 chum salmon.

Prince William Sound Rehabilitation:

Following initial transplants in 1972 of 650 sockeye salmon from Eshamy to the previously barren Herring Bay Lake, an additional 265 sockeye were transplanted in 1973. Incubation boxes on four streams were stocked with 938,000 sockeye and 72,000 pink salmon eggs. An experimental incubation box with about 200,000 sockeye eggs was set up in a spring area on the Gulkana River to test the feasibility of this type of operation in an extremely cold, interior climate.

Cook Inlet Salmon Investigations:

Primary emphasis of these studies was on the determination of optimum escapement and fry stocking levels for sockeye systems in Cook Inlet. This work was carried out as an assessment of the management of natural runs, in connection with existing or proposed enhancement projects and as an aide to planning future run enhancement programs. Total escapements were estimated by use of weirs, counting towers, and sonar counters. One additional counting weir was installed on a Susitna River tributary. Intensive surveys of spawner distribution were carried out in major drainages. Egg deposition and survival to pre-emergent fry stage are being studied in the Kenai and Kasilof drainages. Tow net sampling has been undertaken to determine the relative fry density in six sockeye rearing lakes from various escapement sizes and distribution. Results of these studies will also be used to evaluate the production from enhancement programs.

Background data on existing fish populations and lake productivity was obtained on Big Lake, Hidden Lake, Packers Lake, and Jean Lake to evaluate enhancement programs planned or underway in these systems. Total smolt outmigrations were enumerated from Big and Packers lakes. Packers Lake was rotenoned by FRED and Commercial Fisheries Division personnel and estimates were made of the population of all species present at the time of treatment. Sockeye eggs were taken and fry will be re-introduced after the lake detoxifies. An outlet structure was installed to prevent re-entry of undesirable species.

Sonar Research:

The smolt sonar counter in use on the Kvichak River in Bristol Bay is past the developmental stage and is now operational. An estimated 189 million sockeye smolt outmigrated from Iliamna Lake in 1973 from the 1970 spawners. Initial experiments with this device were made on the Ugashik River. These units, though expensive, are expected to save the state money in terms of fish killed during normal sampling operations, provide more accurate data and allow enumeration in areas where it was not previously possible due to debris or ice flow. During the 1973 studies a sonar smolt counter was developed for use in small apertures such as weir openings or the cod end of nets. Units are relatively inexpensive and will greatly reduce fish handling on these projects.

Based on data acquired in 1972, further improvements were made on the adult sonar counter. The improved model will be available for use in 1974. Greater ease of repair, improved checks for malfunction, and the ability to measure fish distribution across the counter will be provided.

Copper River Sockeye:

The attempt to move the escapement measuring tag and recovery sites downstream closer to the commercial fishery to make their results more directly applicable to management was successful in 1973. Previous upriver fishwheel sites provided accurate data on escapement size, but the results occurred too far after the fishery to be used in in-season management. In 1973 sockeye were tagged by seine below Miles Lake and recovered by fishwheel above it. Work continued on estimating escapement size and composition in systems below the tagging site.

Bristol Bay Test Fishing:

Offshore and inshore test fishing programs substantially overestimated actual numbers of sockeye in the run in 1973. Reasons for this error are being sought, and may include the unprecedented small size of the run and the extremely large size of the fish.

Cook Inlet Shellfish:

Plans were developed to initiate a pot index and expanded tagging program on king crab in 1974. Previous data was analyzed, the results of programs in other areas reviewed and gear was ordered. Monitoring of catch-per-unit-effort and catch composition in the Kachemak Bay shrimp fishery was continued.

Arctic-Yukon-Kuskokwim:

A record commercial harvest was made in the region during 1973 totaling nearly 1.6 million salmon which exceeded the previous high catch made in 1970 by approximately 580,000 fish. The 1973 harvest represented 14.1 million pounds (round weight) of salmon worth in excess of $3 million to the fishermen, the majority of whom are resident Eskimos and Indians.

Record commercial catches of 1,212,000 chum and 194,000 coho salmon were made. The king salmon catch of 127,000 was the smallest since 1966 and 16,000 fish below the previous 12-year average. Other catches made in the region include 5,500 sockeye and 47,000 pink salmon.

By management area, commercial catches of all salmon species were: Kuskokwim—388,000; Yukon—641,000; Norton Sound—177,000; and Kotzebue—380,000.

Primarily due to increased prices, all management areas experienced above-average fishing efforts in 1973. The region-wide license registration in 1973 of 2,254 commercial, 1,650

vessel and 1,966 gear licenses was a record high total. License registration increased approximately 15 per cent over that for 1972.

The projected 1973 subsistence salmon harvest made in the region should not exceed 450,000 salmon and will be one of the smallest harvests ever made. The average annual subsistence harvest recorded during 1960-1972 was 607,000 salmon.

Chum and coho salmon runs were average or above average in most areas. The Kotzebue area chum salmon run and resultant harvest were the largest ever documented since monitoring of this fishery began in 1962. King salmon runs to all areas were below average.

Spawning salmon were counted and sampled for age, sex and size data in index areas. Results indicate the relative magnitude and quality of escapements which are indicative of the effectiveness of the management program. Four counting tower sites were operated successfully throughout the region. Several new Yukon River fall chum salmon spawning areas were found.

Salmon catches were sampled throughout the runs in all major fisheries to obtain age, sex and size compositions. Studies are underway to determine if certain age/sex classes can be selectively harvested by allowing fishing at certain times.

Subsistence salmon fisheries were surveyed to determine harvests, effort and relative success of the fishery. Approximately 2,000 fishing families were surveyed by biologists traveling 2,500 river miles by boat and 1,500 air miles in single-engine aircraft.

A tag and recovery project to determine the size of Unalakleet River pink and chum salmon runs was successfully concluded in 1973. Results are still being analyzed.

A new federally funded project to upgrade chum salmon escapement in the Noatak River was severely hampered by high and turbid water conditions.

Test fishing sites located at the mouths of the Kuskokwim and Yukon rivers provided information on the relative abundance and timing of king and summer chum salmon runs. Studies were also conducted to obtain age, sex and size composition of salmon taken in gill nets of varying mesh sizes. Results are used to obtain the maximum sustained yield for mixed chum and king salmon fisheries.

Westward Alaska:

As in 1972, the 1973 pink salmon runs continued to be extremely poor for the entire Westward Region. The 1973 pink salmon harvest of 587,600 represented a harvest of approximately 2.1 million fewer pink salmon than the poor 1972 harvest. The normal pink salmon commercial catch for this region is slightly over 10 million annually during the previous 10 years. Pink salmon are the major contributing species within this region. Extremely severe winter conditions of 1970-1971 and 1971-1972 and resulting lower-than-normal recorded estuary temperatures are considered to be the major factors in the drastically reduced return of pink salmon stocks.

The region's harvest of chum salmon totaled 776,400, which was approximately 1.2 million less than in 1972 (a year in which the harvest was about 20 per cent above the previous 10 year average). The regional 10-year average annual chum salmon commercial harvest is approximately 1.8 million fish. A downward trend of chum salmon stocks is anticipated because the progeny returning will be derived from years of poor environmental conditions, the same years which affected the poor returns of pink salmon in 1972 and 1973.

The 1973 Westward Region red salmon commercial harvest was approximately 143,000 more than the 1972 catch level. The Chignik red salmon return accounted for the increase, with other areas contributing less harvest than the previous year. The 1973 red salmon harvest of 1,534,400 was less than the previous 10-year average of about two million red salmon per year.

King and coho salmon are minor contributors to the Westward Region salmon harvest. During 1973, a total harvest of 5,800 king salmon and 59,800 coho salmon was attained. This harvest was below average, due in part to a restricted commercial harvest of other species with a subsequent decrease in incidentally caught king and coho salmon.

A total harvest of 2,964,000 salmon was attained in the Westward Region during 1973. The

total catch was 3,156,000 less than 1972 and was primarily due to the continued downward trend of the pink salmon stocks.

Escapement levels of the major contributing species were below average for pink salmon and chum salmon due to the extremely poor returns throughout the region. Complete restriction of the 1973 pink and chum fishery was necessary in the Chignik area and drastically reduced seasons were imposed by emergency order in the Kodiak and Alaska Peninsula-Aleutians areas to bolster escapement rates. The restricted pink salmon fishery allowed chum salmon escapements to attain low to mid range levels, except in certain portions of the Kodiak area where average or better escapement levels were obtained. Except for the Kodiak area, the pink salmon escapements fell to record low levels due to the extremely low magnitude of the total return. Red salmon escapements were average for most systems, except for the very low escapement attained in the Karluk system on Kodiak Island and the better than anticipated escapement for the Chignik River red salmon run.

It is anticipated that normal pink salmon returns could not be expected to reach normal levels within the Region until at least 1976, providing that an upward trend of survival prevails from the 1974 escapements. Decline in abundance of chum salmon is also anticipated when the progeny subjected to the severe environmental conditions return in 1974 through 1976.

The shellfish fishery requires monitoring by biologists and technicians stationed at processing plant locations, contacting or accompanying fishing vessels to determine condition of catches and gathering biological information for proper management of the resource. Processing plants extend from Kodiak to Adak, with entry of floating processing vessels into the Bering Sea and Aleutian Islands fishing grounds. Annual population studies are accomplished by trawl and pot index programs on king crab, tanner crab, and shrimp stocks to determine annual bio-mass abundance levels. Tagging studies are being conducted on certain king crab and tanner crab stocks to determine growth rates, abundance and fishing mortality of various stocks. Fishing vessel log book programs to refine catch-per-unit-effort data and other fishery statistics has been a continuing program on the expanding shellfish fisheries. Compilation of commercial harvest rates by statistical area from commercial fish ticket information is a major function of the regional shellfish program. Life history studies of shrimp, tanner crab, king crab and razor clams have continued.

Fishermen landed 225 million pounds of shellfish in the Westward Region during 1973, exceeding the 1972 production level by 53 million pounds.

The total shrimp harvest for the Westward Region will be approximately 107.8 million pounds for 1973, exceeding the 1972 catch level by 33 million pounds. Kodiak shrimp catches increased 11.2 million pounds and the Shumigan harvest increased 7.3 million pounds over the previous year. The largest increase in production occurred in the Chignik shrimp stocks which reached 13.7 million pounds above the 1972 level.

The regional king crab harvest for 1973 will total about 69.3 million pounds, which is within one million pounds of the 1972 harvest. Bering Sea king crab catch levels increased to 28.1 million pounds, which was a gain of 6.4 million pounds over 1972. The only significant decrease was the Adak-Western Aleutians fishery. Harvest levels for 1974 are expected to equal if not increase over the 1973 harvest.

The tanner crab fishery was greatly expanded in the Westward Region during 1973. The total harvest was about 37.7 million pounds which considerably exceeded the 1972 catch level of 15.5 million pounds. This 22.2 million pound increase was primarily due to an 87 per cent increase in the Kodiak area catch level. Restrictions were imposed on the 1973 Kodiak fishery to hold the total catch at approximately 30 million pounds. The 1974 fishery is anticipated to equal the 1973 Kodiak harvest; and, expansion of effort in the areas west of Kodiak will undoubtedly greatly increase the overall harvest level.

The Region's dungeness crab fishery during 1973 existed almost entirely in the Kodiak area, with limited fishing occurring on the South Peninsula grounds. The total 1973 harvest of 2.1 million pounds was almost identical to the 1972 harvest level. Past harvest levels above six million pounds may be reached in the future, when a strong age class enters the fishery. Further expansion of fishing effort into the Chignik and South Peninsula areas is anticipated during 1974.

The razor clam fishery exists only on the Swikshak Beach in the Kodiak area, although other beaches are available along the Alaska Peninsula. The Swikshak Beach has been certified for intra-state utilization of razor clams for human consumption and the Department contributes to this program by providing the razor clam samples for scheduled toxicity tests. A razor clam research program continued at Swikshak Beach during 1973 and provided information for optimum harvest levels. The 1973 harvest of 161,800 pounds of razor clam was about 10,000 pounds above the 1972 harvest level. The fishery was conducted entirely by hand digging with most of the product utilized for dungeness crab bait. Annual harvests of 300,000 pounds would provide a conservative utilization of the Swikshak Beach area.

Scallops are taken in the Kodiak area and are landed in both Kodiak and Seward. The landings during 1973 produced 805,000 pounds of shucked scallop meat. Landings were very similar to the last four years, with a decreased vessel effort factor.

A total of 831 tons of herring were taken during the 1973 season in the Westward Region. The harvest occurred in the Kodiak area and the majority of the catch was utilized for roe purposes. Only one processor utilizes the carcasses for meal and oil. Limited amounts of herring were taken for bait purposes. Herring fishermen had difficulty finding schools of herring in the proper stage of pre-spawn condition to provide an economical level of roe recovery. The Department continued to monitor the herring catch composition to provide a biological data base for future herring studies.

Increased numbers of resident vessels were involved in the 1973 halibut fishery in the Kodiak, Chignik, Shumigan and Unalaska areas. The high prices for halibut and the poor salmon season led to many salmon vessels entering the fishery. Only landings made at Kodiak were tallied, since total catch records are maintained by the International Pacific Halibut Commission. The poundage landed at Kodiak totaled 6,921,000 pounds for 1973, which represented a 1,439,000-pound decrease from 1972. Generally halibut stocks were less abundant throughout the region this year.

A forecast of the 1974 pink salmon returns to the Kodiak, Chignik and Peninsula areas was accomplished by relating alevin indices of relative abundance to subsequent adult returns. Data collected from previous years alevin sampling and analysis of escapement and commercial harvest data provided the trend analysis.

The standard sampling procedure was to hydraulically dig the pre-emergent fry from the spawning riffles of a set of predetermined index sample sites from index streams. A turbine-powered helicopter carried crews between base camps and index streams.

The sampling program generally indicated indexes ranging from below average to the lowest recorded for even year index streams. The poor return of pink salmon during 1972 and continued severe climatic conditions suggest that the 1974 pink salmon return for the Westward Region may very well be the lowest in the history of the fishery.

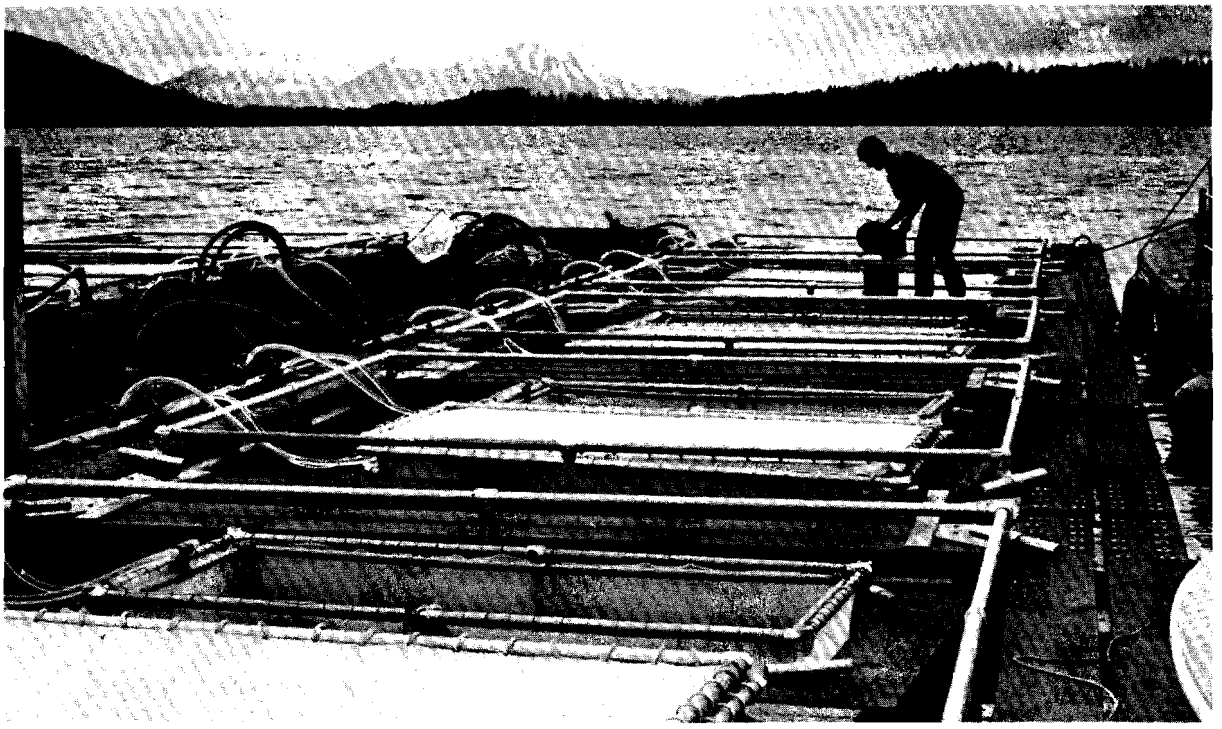
The red salmon forecast program for the Chignik River system was continued during 1973 and provided a forecast of 400,000 red salmon by July 1 and 590,000 after that date.

The forecast method required intense sampling of the composition of commercial catch and escapement. Age analysis was utilized to determine the magnitude of the returning three-ocean age fish to the system by the relationship of numbers of two-ocean fish entering the system the previous year. Age data obtained from scale samples at Chignik from 1954 to present are utilized.

Shrimp research is presently being conducted in the Kodiak, Chignik and Shumigan Island areas. The Kodiak program is funded primarily under the federal Commercial Fisheries Research and Development Act and the Chignik and Shumigan Island program is funded in part by this Act. A new state funded program for the Chignik-Shumigan fishery was initiated July 1, 1973. The primary goal of these projects is to provide the basic biological data necessary for effective management of the shrimp resource. Life history studies and stock abundance has been the major thrust of these programs. The stock abundance studies conducted by trawl surveys provided population estimates in the Kodiak area that indicated desired harvest levels to insure a sustained yield fishery. Trawl surveys of the Chignik and Shumigan fisheries are currently being conducted to provide similar information.

During 1973, 70 days of vessel charter were utilized to continue the Kodiak area king and tanner crab population indexing study. The main purpose of this program was to develop an annual index of the relative abundance of pre-recruit, recruit and post recruit crabs in the population. The indices provide the data required to develop population estimates of various size groups of crab, thus allowing management to regulate harvest rates to insure annual harvests on an economic and biological sustained yield principal.

Life history studies are currently being conducted on tanner crab and king crab. This program is funded in part by the Federal Commercial Fisheries and Development Act. ■



Division of Fisheries Rehabilitation Enhancement & Development (FRED)

I. PURPOSE AND DUTIES:

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 waters and continental shelf areas.

Methods currently employed to accomplish the above are as follows:

Estuarine Rearing:

This concept of salmon rearing was initiated in Alaska in 1972. The basic reason for using pens in saline water is to take advantage of the seawater which has temperatures higher than fresh water during the late fall, winter and early spring. Within limits, the warmth of the water in which the fish are reared has a direct bearing on the rate at which they feed and grow. As this increased temperature does not require artificial heat, the operating costs of the estuarine rearing facilities should be less than that of a hatchery where heated recirculated water is used to obtain rapid growth. The saline water also has an inhibiting effect on several fish disease organisms.

Gravel Incubation Boxes:

A system has been developed by R. A. Bams of Canada and the National Marine Fisheries Service (NMFS) to incubate salmon eggs in a carefully controlled environment. Boxes with a

volume of one cubic foot seeded with 10,000 eggs per box in a laboratory test produced 8,500 viable pink salmon fry per box. This is a five- to tenfold increase in survival over what could be expected from natural stream spawning.

The Department of Fish and Game is cooperating with NMFS in developing a test production facility at Auke Creek on land owned by the Territorial Sportsmen.

Lake Rehabilitation:

This approach, removing competitor and/or predator fish species by chemical treatment and restocking with the desired species, is used to restore salmonid runs which have become depleted or to establish runs of desirable commercial or sport fish where none previously existed. It has proven to be a very useful tool in enhancing existing runs or extending the habitat to unutilized areas. This approach may be useful on relatively small lakes.

Fishways:

Various types of fish pass facilities have been employed in many countries to extend the spawning range above either complete or partial barriers to salmonids.

An aluminum Denil-type, with angled vertical baffles, developed by Gil Ziemer, engineer for the Alaska Department of Fish and Game, has been very effective at several locations in Alaska and also is used in Canada.

Stream Clearance:

Removal of beaver dams and log and debris barriers which cover spawning areas and impede or completely block the migration of salmon upstream has been beneficial in improving the spawning and rearing habitat. To date, this work has been concentrated in Southeastern Alaska where severe windstorms result in windthrown trees which create obstacles to fish movement and cover spawning areas.

New Methods:

Also under study is the feasibility of making very large plants of juvenile salmon in lakes having indigenous populations of various species to determine if self-sustaining runs can be established without chemical treatment which is a relatively "surefire method" but is extremely expensive.

ACCOMPLISHMENTS:

Westward Region:

Akalura Lake (45,000 acre feet) on Kodiak Island is scheduled for rehabilitation to remove competitor and predator species. The purpose of this project is to restore a sockeye run that has undergone a long-term decline and has had only token returns of salmon in recent years. The project consists of construction of an outlet fish control barrier, chemical treatment to eliminate indigenous fish populations, and re-establishment of sockeye salmon in the lake from the small existing escapement and by artificial means.

The environmental impact statement for Akalura rehabilitation was revised periodically throughout the year and has not as yet been approved.

Gravel incubation boxes were put into production at the Kitoi station. The emergence of pink salmon fry reached its peak in mid-April and a total of 329,725 had been released into Big Kitoi Creek as of April 17. Total pink fry production was close to 500,000.

The entry to the Frazer Lake fishladder was modified and a diversion weir constructed to improve ascent into the lake of adult sockeye spawners. A total of 56,254 sockeye were counted through the ladder. The cycle year escapement (1968) was 16,707. This run is rapidly increasing and appears to be well on the way towards reaching its maximum potential. It was started in 1951 with green egg plants, followed by fry and adult spawner transplants.

The Department took 1.55 million sockeye eggs at Red Lake from July 26 through August 2, 497,500 pink salmon eggs from Big Kitoi Creek and 1,000,000 coho eggs from Upper Station Lake for incubation at the Kitoi facility.

Biological studies were continued on Akalura and Karluk lakes. This work consists of taking index counts of salmon smolt at Akalura to arrive at a total outmigration figure, adult

enumeration and spawning distribution plus plankton sampling. Measurement of tributary flows and velocities, mapping of lake depth profiles and spawning areas were carried out in the Karluk system, in addition to plankton sampling.

The Karluk sockeye runs, once the major source of sockeye production in the entire Westward region, were decimated by overfishing many years prior to statehood. Long-range plans of the Division include bringing this once-famous fishery back to its former production level.

Rehabilitation of the Akalura system, once an important contributor to the Kodiak area sockeye fishery, will be of considerable economic benefit to fishermen of this area.

Central Region:

Activities in the Central Region accelerated greatly with initiation of new projects, plus relocation and expansion of the estuarine rearing facility in Kachemak Bay.

Snake Lake Project:

Snake Lake lies to the northwest of Dillingham and immediately to the south of the Wood Lakes system in the Wood River Mountains. It has a surface area of 55.3 square miles.

The overall objective is to develop and evaluate an economically feasible semiartificial red salmon producing system that will find general application in Alaska.

Component objectives:

1. Design, construct, test and evaluate a modular gravel incubator production unit with a capacity of 10 million eggs and a potential to produce 8.5 million high quality fry.
2. Design, construct, test and evaluate three freshwater rearing methods using known numbers of sockeye fry from the gravel incubation unit.
   (a) using an unaltered natural rearing system
   (b) using an impounded bight or small adjacent lake system where predators and competitors have been removed
   (c) using rearing pens with supplemental feeding
3. Evaluate techniques for management of lake nursery areas by means such as removal of predators and competitors and artificial fertilization.

Snake Lake was chosen for this work due to its location in the important Bristol Bay red salmon producing area plus the fact that the run shows evidence of being markedly depressed for an extended period. In recent years the total run has averaged 37,800. Estimated average salmon fry carrying capacity is 36 million. Estimated present average red salmon fry input from natural spawning is 4.68 million.

Kasilof Incubation:

This gravel incubation unit under construction at Crooked Creek, a tributary to the Kasilof River, is near completion and will be incubating 1.2 million sockeye eggs and 300,000 coho eggs this winter. Initial capacity of this facility will be about 10 million salmon eggs.

Packers Lake Rehabilitation:

This lake of 475 surface acres is located on Kalgin Island in Cook Inlet. Over the years the sockeye run has become debilitated. In order to restore the run to its maximum potential, the lake was treated with fish toxicant to remove all predator and competitor species. About 85 per cent of the fish killed during the rehabilitation were sticklebacks. A fish barrier was installed prior to rehabilitation and the returning adult sockeye were trapped for egg taking. An estimated 1.38 million eggs were taken from 550 females. The resultant fry from these eggs will be planted in Packers Lake.

Cook Inlet Estuarine Rearing:

Initial difficulty was experienced at the Kachemak Bay salmon rearing facility early in 1972 with fairly high mortalities of fish due to predation, disease and failure to adapt properly to salinity levels, plus some unaccountable losses. Proper salinity levels had to be determined by experimentation during this first year of operation. The unit was moved from Jackalof Bay to Halibut Lagoon in the spring of 1973 and enlarged to accommodate 500,000 fish. An estimated 483,000 coho salmon were stocked in these pens during July. Survival as of Jan. 1, 1974 has been good.

Other Projects:

Preliminary work is being carried out at four other incubation sites, Big Lake, Hidden Lake, Humpy Creek and Tutka Lagoon. The United States Geological Survey has provided water and temperature gauge recorders for Humpy Creek and Tutka Lagoon and will be conducting discharge measurements in Meadow Creek and Fish Creek to determine base flows. Temperature gauges will be installed in Meadow Creek and Big Lake. Environmental impact statement information for a fishway at the Russian River falls is being prepared for the federal reviewing. Also the impact statement report for Lower Jean Lake should be finished shortly.

Clam Resource Development:

Studies were conducted in the Prince William Sound-Copper River flats area to gather information on the feasibility of clam "farming," i.e., checking annual growth by size and age class of marked and planted littleneck and butter clams.

Finalization is in progress of a memorandum of understanding among the Departments of Fish and Game, Public Safety and Health and Social Services. This memorandum is to be submitted to the Food and Drug Administration prior to Alaska's admission to the National Shellfish Sanitation Program (N.S.S.P.). Upon receiving admission to N.S.S.P., certified Alaskan processors will be allowed to ship interstate fresh, eviscerated razor clams for human consumption and whole denatured razor clams for bait.

Arctic-Yukon-Kuskokwim Region:

Whitefish Investigations:

The purpose of these investigations initially was to determine whether a freshwater fishery (primarily for whitefish) was feasible in the Arctic-Yukon-Kuskokwim area. Two primary considerations were involved: (1) relative abundance of whitefish and other marketable freshwater species; and (2) whether such an operation would prove to be economically feasible. Results to date on the above two considerations are favorable. Good populations of whitefish and other species have been found and an inventory of the freshwater fishery resources of the Yukon-Kuskokwim Delta is continuing. Commercial utilization is growing slowly. About 16,000 whitefish, weighing approximately 52,000 pounds, were sold in the Bethel area. Smelt and blackfish were commercially utilized for the first time this year and the demand far exceeded the harvest.

Southeastern Alaska:

Estuarine Rearing:

The salmon rearing unit at Starrigavan, near Sitka, was enlarged from a capacity of approximately 300,000 to 800,000 salmon smolts. This entailed installation of both freshwater and saltwater pumps and piping to provide the required water volumes. Additional floats were constructed and pens attached.

As with the Kachemak Bay facility, during the first year of operation problems occurred in determining optimum salinity levels for growth and survival. However, despite the fact that this is a new concept, 9,728 marked king salmon smolts and 36,272 marked coho were released in good condition from this facility in June, 1973. As of Jan. 1, 1974, an estimated 716,000 coho and king salmon are being reared at the facility for release.

Of the three species of salmon reared at this facility, the sockeye salmon displayed the greatest growth. At one year of age, they averaged 8½ inches in length which is five inches longer than wild sockeye of the same age.

This Division is cooperating with the National Marine Fisheries Service in an estuarine rearing program at Little Port Walter where an additional 265,000 coho salmon are being reared for release.

Borodino and Osprey Lake studies (Located on the south end of Baranof Island):

Background biological information is being collected on these two lakes to evaluate the feasibility of stocking them with salmon.

If such stocking could be done with favorable growth and survival resulting in a significant adult return, an inexpensive new avenue for initiating runs would be opened. As mentioned previously, lakes can be chemically treated to remove all competitor/predator species but this procedure is expensive.

Gravel Box Incubation:

At the Auke Creek installation, 235,600 eggs were taken from 170 female pinks in the fall of 1971, the first year of operation. The eggs from these fish represent approximately 1/6 of the potential egg deposition for upstream Auke Creek. It was not possible to count the intertidal spawners in Auke Creek, but 2,232 adults were counted through the weir en route to upstream spawning areas in 1971.
The pick off of dead eggs prior to placing them in the gravel boxes was 4.8 per cent.

In April, 1972, an estimated 157,000 fry were in the streambed above the weir and 16,000 below the weir for a total of 173,000. Approximately 181,000 incubator fry were released from the gravel boxes.

In the fall of 1972, a total of 1,768 adult pink salmon were counted through the weir. Intertidal spawners below the weir were not enumerated.

A total of 667,659 eggs were taken from 386 females, and 459 females were released to spawn naturally above the weir. The pick off of dead eggs after eyeing amounted to 6.8 per cent.

In the spring of 1973, 560,800 pink salmon fry were produced from the gravel boxes. Total creek fry production was estimated to be 86,000.

A total of 5,500 adult pink salmon returned to Auke Creek in August and September of 1973, following releases in 1972 of 157,000 wild fry and 181,000 gravel box produced fry. This was the largest return of pink salmon to Auke Creek in recent times. The return represents a combined natural and fishing mortality of 98.5 per cent which is typical, on the average, for Southeastern Alaska pink salmon. None of the fry released in 1972 were marked, so that no comparison can be made between survival of wild and artificially reared fry. A representative number of fry released in 1973 were marked to permit such comparison of the adults returning in 1974.

Stream Clearance: A stream clearance program resulted in improving access to spawning grounds for upstream salmon migrants, recovery of spawning area and preventing channel diversion in 12 streams in Southeastern Alaska.

Work consisted of removing windthrown trees, stumps and logging debris and was conducted from mid-April through mid-June.

In conformity with AS 16.05.092, a detailed report covering the Division's activities for 1973 will be submitted to the legislature as required. ■

Game Division

I. PURPOSE AND DUTIES:

The Game Division, in accordance with the concept of sustained yield as specified in Section 4, Article VIII 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 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.

II. ACCOMPLISHMENTS:

In 1973 a major portion of the Game Division's financial and manpower resources was directed to three major programs which had and will continue to have immeasurable impact upon Alaska and its people. In addition, Game Division staffers maintained continued involvement in pending federal legislation which could seriously affect management of Alaska's renewable resources in the future. Staff biologists were called upon to provide much of the wildlife-related information during preparation of the Environmental Impact Statement for the trans-Alaska pipeline, and review of this important document was even more time-consuming. Equally demanding was the necessity for a tremendous input of information into the settlement of the Native Land Claims Act. In many instances federal agencies relied heavily on the expertise and experience of Game Division biologists while formulating their proposals for public interest

areas to be considered by Congress for inclusion in the federal system of National Parks, Wildlife Refuges and National Forests. These considerations, accomplished under the Alaska Conservation Bill of 1974, will have tremendous impact upon hunters and other citizens of Alaska, and the critical nature of input from the state at this time cannot be overestimated.

The third major program which the Game Division staff faced in 1973 was the change of management status of marine mammals under the Marine Mammals Protection Act of 1972. With passage of this act, management of Alaska's marine mammal populations reverted to the federal government. Provisions were made, however, for the states to regain management authority if their management proposals were acceptable to the appropriate federal agency. Game Division biologists spent the first two months of 1973 preparing status reports and management proposals for federal consideration. Later in the year, additional time was spent assisting one of the involved federal agencies to prepare an Environmental Impact Statement directed towards assessment of the effect of returning management authority over several marine mammal species to the State of Alaska.

Not all marine mammal associated activities were so negative in 1973. One of the Game Division biologists was selected as a member of the Marine Mammals Advisory Committee, a prestigious group developed as advisors to the three-man Marine Mammal Commission. This biologist also participated in the scientific cruise of the "Alpha Helix" into the Bering Sea to gather additional information on arctic seal populations. As part of the new U. S.-Soviet cooperative research ventures, a prominent Soviet biologist was the guest of our marine biologist during several months of 1973.

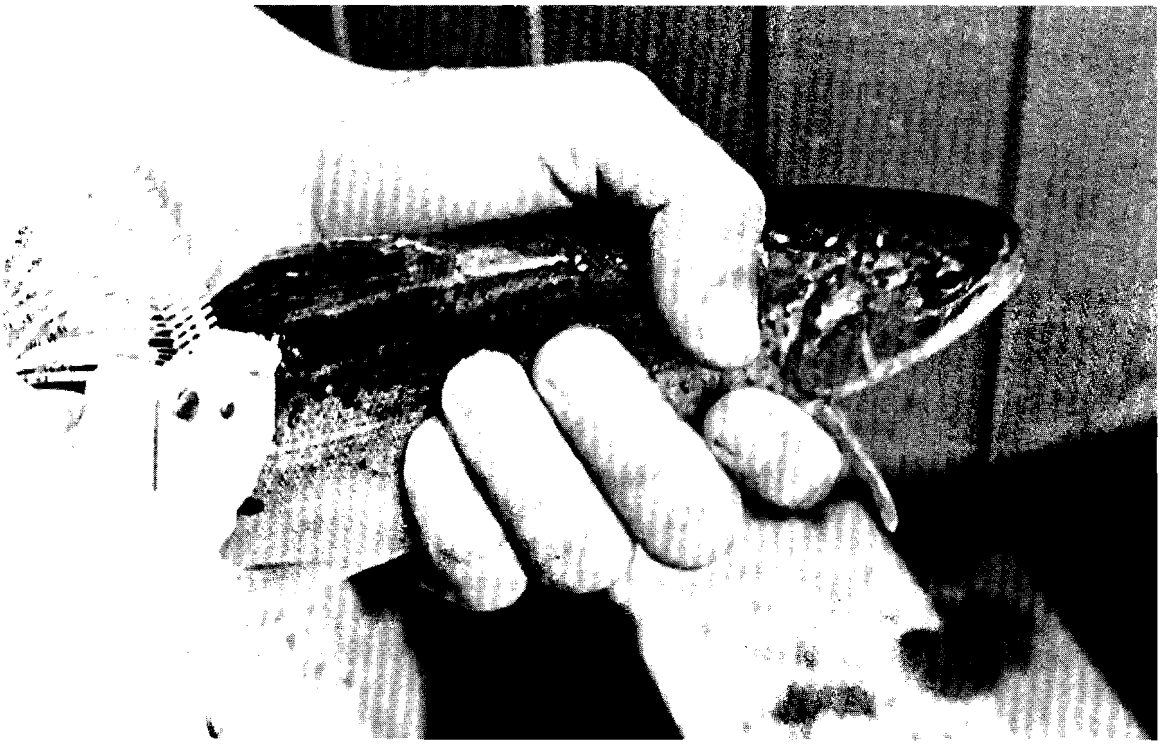
Early in the year, Game Division management policies, developed over a period of several years, were approved by the Fish and Game Board and were published and disseminated to the citizens of Alaska. Work progressed on development of comprehensive species management plans during the year and it is hoped that first drafts of some plans will be completed by the end of 1974.

During 1973, staff biologists achieved the first accurate aerial census of the 40-mile caribou herd. Biologists also completed an intensive assessment of marine mammal populations in Prince William Sound and conducted the first comprehensive area survey of Dall sheep populations in the Wrangell and Chugach mountain ranges in approximately five years.

Research efforts by Division biologists continued to provide high quality information for the state's management program. In March, staff moose research biologists authored and co-authored seven review papers on moose biology and management. These papers, presented at an International Symposium held in Quebec, Canada, were a major contribution toward updating our knowledge of this important species. They are being published, in book form, as proceedings of this meeting and will provide, in one place, an excellent comprehensive review of moose research conducted in Alaska. Staff research biologists published 10 additional scientific papers during 1973 and many more manuscripts were prepared and submitted to journal editorial boards. A fourth wildlife technical bulletin, entitled "Game Transplants in Alaska," was prepared, edited and bid for printing in 1973. This document will be printed and disseminated early in 1974.

Field research conducted during 1973 was highlighted by brown/grizzly bear studies on the Alaska Peninsula, Southeastern Alaska and the North Slope. Studies at the Black-Chignik lake area of the Alaska Peninsula continue to provide the comprehensive data necessary for managing this intensively harvested brown bear population. Southeastern studies are directed at determining impacts of clear-cut logging upon brown bear populations, and North Slope studies were aimed at assessing total populations and productivity of arctic grizzly bears prior to expected extensive petroleum development in this area.

Additional important management activities conducted during 1973 included: 1) establishment of a permit system to regulate numbers and activities of photographers using the McNeil River Brown Bear Sanctuary, 2) dissemination of a questionnaire to determine the attitudes and needs of Alaska's sheep hunters, 3) development of the Potter Point Waterfowl Refuge near Anchorage as a bird watching and waterfowl hunting area, and 4) initiation, in cooperation with the U.S. Forest Service, of studies to enhance migratory bird habitat on the Copper River Delta and continuation of habitat improvements on the Stikine River Delta (also in cooperation with the U.S. Forest Service). ■



Sport Fish Division

I. PURPOSE AND DUTIES:

The Sport Fish Division is responsible for the orderly recreational harvest of razor clams and approximately 40 species of game fish in Alaska. The species fish found favorable by anglers and the areas used to satisfy the demand are annually increasing. The Division through timely management techniques and progressive research programs has sought to insure an optimum yield as well as diversified fishing experiences.

More time and effort is given to sport fishing than any other single outdoor avocation in the state. The interest and enthusiasm in pursuing this sport has increased about 11 per cent annually for the past ten years.

II. ACCOMPLISHMENTS:

REGION I (Southeastern Alaska):

During 1973 progress was made in the development of salmon rearing facilities and in the establishment of salmon egg take sites. An economic survey of sport fishing in the Juneau area indicated boat anglers spend an average of $83 to catch a salmon.

Land Use Studies — Eight multi-disciplinary team surveys were conducted in conjunction with the U. S. Forest Service in the Tongass National Forest. The areas covered were: Trap Bay and Corner Bay, Chichagof Island; Bear Creek, Mitkof Island; Duncan-Tonka Mountain, Kupreanof Island; Olive Cove and Quiet Harbor, Etolin Island; Canal Inlet-Thorne Arm, Revillagigedo Island; and Cholmondeley Sound, Prince of Wales Island. These surveys included overall watershed studies as well as field surveys of specific sale units. A state land use planning team was established for the Haines-Skagway areas. Field surveys were conducted and recommendations for protection of the sport fishery resources made.

A research study on winter movement of rearing anadromous fish and the effect of ice formation on winter survival was started in the Starrigavin watershed near Sitka.

King Salmon — Studies included determining the current status of the Taku River chinook

salmon stock, monitoring escapements in major chinook systems and developing methods of enhancement and racial separation.

Ground and aerial surveys conducted during the peak of spawning indicate that native chinook salmon populations are at a low level. Since spawning grounds are presently underutilized, it is recommended that no egg takes be made in Southeastern Alaska unless protective measures are made to increase escapements.

Preliminary indications are that separation of Alaskan and non-Alaskan chinook salmon stocks can be achieved by analysis of the freshwater zone of a scale. Results of simulated sampling via the computer indicate that the Juneau sport catch is composed of 90 per cent Alaskan chinook salmon and 10 per cent non-Alaskan, while the Sitka sport catch is composed 100 per cent of chinook of non-Alaskan origin.

Catalog and Inventory — Creel census programs were conducted in the Juneau, Ketchikan and North Behm Canal areas to determine utilization levels of sport fish resources.

Basic biological investigations were conducted on lakes and rivers of West Chicagof and Yakobi islands to evaluate fisheries potential of this area. This was done in conjunction with the "West Chicagof-Yakobi Land Use Study," sponsored by the U. S. Forest Service. Sport fish resources along the Prince of Wales Island road system were studied and recreation inventories completed for each aquatic system.

Redoubt Lake near Sitka and Peterson Lake near Juneau were investigated so management plans could be formulated for these lakes. A bioassay experiment was conducted on Peterson Lake to determine the toxicity of Antimycin A on Dolly Varden char under low pH, soft-water conditions.

The effect of chlorinated sewage effluent on fish in the Mendenhall River was studied by placing live cages in effluent with varying concentrations of chlorine residual.

Steelhead-Cutthroat — The steelhead-cutthroat trout life history project initiated in 1971 on Petersburg Creek was continued through the 1973 field season. Adult steelhead were tagged as they entered Petersburg Creek in the spring and were found to be available to the angler for an average of 30 days before they returned to the sea. The 1973 run of steelhead was again found to be comprised of nearly 50 per cent repeat spawners in a run of approximately 500 fish. Tagging of sea-run cutthroat was continued and these marked fish were recovered in several nearby stream systems during 1973. Cutthroat tagged at Petersburg Creek but not in 1972, were recaptured at the Petersburg Creek study site in 1973. This leads to the assumption that these cutthroat had spent the year of 1972 in some other stream system and were returning to Petersburg Creek in 1973 after an absence of over one year. Studies of rearing requirements of steelhead and cutthroat were continued and it was found that these species are dependent upon small tributary streams during their first year of life. This information was valuable in making recommendations on land use activities to the Forest Service.

Mendenhall Ponds Fishery Development — The second stage of the Mendenhall Ponds fishery development program was completed during 1973. Dredging of Moose Lake increased this pond from 18.5 to 46.3 acre feet in area. Fish-control structures were built and installed at inlets and outlets of all major lakes, and the entire watershed was chemically rehabilitated. Following detoxification, Dredge Lake was stocked with 141,600 coho fry, Norton Lake with 128,400 coho fry, and Moose Lake with 155,000 large king salmon fry. These fish were fed twice daily from mid-August until freeze-up in early November. During October, 185 adult coho entered the holding pond, and 224,400 eggs were taken for future brood stock. A winter aeration program for these three lakes started in early December.

REGION II (Southcentral, Bristol Bay, Kodiak):

Programs conducted in 1973 were directed toward the management of some of the most intensive fisheries within the state and the enhancement of additional recreational fisheries where biologically feasible.

Russian River Red Salmon Fishery — The red salmon sport fishery on the Russian River received a record effort of 31,100 man-days during 1973. The harvest of 15,760 red salmon was above the 12-year mean of 11,090. The early run escapement past the Lower Russian Lake weir

of 13,120 was considered excellent. The late run escapement of 24,970 was substantially below the 12-year mean of 39,932.

Kenai Peninsula King Salmon Fisheries — A total of 12,068 punch cards were issued to king salmon anglers utilizing the three lower peninsula streams. An analysis of 56 per cent of the punch card returns coupled with a limited telephone survey in the Anchorage area provided the following harvest estimates: Anchor River — 324; Ninilchik River — 297; Deep Creek — 147. An estimated 14,160 man-days of effort were exerted on these three streams during this six-day fishery. The combined king salmon minimum escapement of 2,519 for these streams was similar to the 12-year mean of 2,663 fish.

The king salmon saltwater fishery south of Deep Creek increased 128 per cent from 1972 to 8,220 man-days of effort. The marine harvest was estimated at 1,030 king salmon.

Upper Cook Inlet King Salmon Inventory — During 1973, more than 120 rivers, creeks, and their tributaries were surveyed to ascertain the relative abundance and distribution of king salmon escapement in spawning streams of Upper Cook Inlet.

A total of 13,546 king salmon were actually counted in Upper Cook Inlet — Susitna tributary streams in 1973. Extrapolation of enumeration counts for these same streams indicate an estimated escapement totaling 15,000 king salmon.

East-side tributaries of the Susitna River are believed to have contained more spawning king salmon in 1973 than in any year since statehood. In those streams where direct comparisons can be drawn between 1972 and 1973, a total of 7,165 king salmon were counted in 1973 as compared to 1,775 in 1972.

Results of the 1973 aerial and ground surveys indicate there are no "new" or previously unknown stream systems in Upper Cook Inlet producing substantial numbers of king salmon.

Bristol Bay Trophy Fisheries — In continued recognition of the uniqueness and value of the Lake Iliamna rainbow trout stocks, the Lower Talarik Creek rainbow life history study was continued in 1973. Collected biological information from the Talarik Creek research project, and from related investigational findings, indicates substantial increases in sport fishing interest and effort in the trophy fish area.

Data collected from the rainbow trout research project are aiding in the refinement of sound techniques for the management of this valuable fishery.

Catalog & Inventory Studies — A total of 70 lakes were surveyed for biological information during 1973. A number of these waters were investigated for the first time, while others were re-assessed for success and/or progress of various management techniques applied. Where possible, enhancement of surveyed waters has been initiated to provide greater recreational angling opportunity.

Cook Inlet Razor Clam Fishery — The razor clam fishery on the east side beaches of Cook Inlet increased substantially during 1973. An estimated 23,770 man-days of effort harvested 682,600 razor clams. Diggers averaged 36.1 clams per trip, which is above the four-year mean of 31.1.

Resurrection Bay Silver Salmon Fishery — This past year the Resurrection Bay silver salmon fishery received 24,300 man-days of effort with 13,910 fish taken. An estimated 3,000 marked silver salmon were taken in the fishery as a result of smolt plants in the Seward Lagoon.

Cook Inlet Lake Research — A research program designated to assess water quality and plankton productivity was conducted on seven Matanuska-Susitna Valley lakes during 1973. Data from this program will be summarized and used to implement an indexing system, relative to the productivity and fish stocking capacity of Matanuska Valley lakes.

Five lakes were stocked at varying densities with different sizes and racial strains of rainbow trout and silver salmon to determine optimum growth and survival of the different strains, and the maximum stocking size and density for lakes of differing productivity.

Egg Takes — Region II personnel participated in the collection of 1,260,000 grayling, 475,570 king salmon, and 2,241,600 silver salmon eggs during 1973. The majority of these eggs will be hatched and reared at the Fire Lake facility at Eagle River, and will be used to support on-going stocking programs. Some of these eggs will also be utilized in the new saltwater rearing program.

Lake Rehabilitation — Region II personnel chemically treated 12 lakes with rotenone during 1973. Total area was 994 surface acres. Game fish will be restocked following detoxification.

REGION III (Interior Alaska):

Region III, Arctic-Interior, consists of some 400,000 square miles north of the Alaska Mountain Range, including the Seward Peninsula and North Slope.

Management — Since nearly 600 miles of the forthcoming trans-Alaska pipeline will be constructed in Region III, effort has continued to be placed on pipeline related activities. All waters to be crossed by the pipeline from Prudhoe Bay to Isabel Pass have been assessed for sport fishing values. Considerable time has also been devoted to coordinating activities of the Corps of Engineers, Bureau of Sport Fisheries and Wildlife and other agencies in connection with the Chena River flood control project which is now under construction.

Rehabilitation — In 1973, seven lakes and ponds, totaling 85 acres and 1,600 acre feet, respectively, were chemically treated to remove rough fish and were restocked with rainbow trout or silver salmon. Rainbow trout planted in newly rehabilitated 1,500-acre Quartz Lake in 1972 showed excellent growth and catchability. Most fish caught were from 15 to 19 inches long by late summer of 1973.

New Regulations — A new regulation provides for a month longer season for the spearing of whitefish in the Tanana Drainage. This type of fishing experienced a rapid growth in popularity with a harvest of approximately 4,000 whitefish in the Chatanika River. In 1973, 590 anglers spent 1,018 hours on this sport compared to 175 anglers and 302 hours in 1972.

Monitoring and Evaluation of Arctic Waters with Emphasis on the North Slope Drainages — Work in 1973 consisted of lake and stream surveys, assessment of fishery utilization, continuation of yearly aerial counts as an index to char abundance in the Sagavanirktok River and char tagging studies.

Four important North Slope lakes were surveyed: Chandler Lake, Shainin Lake, Itkillik Lake and Elusive Lake. Physical and chemical parameters of the lakes were recorded. The fish populations were studied to determine species, abundance, growth, food habits, age, length, sex ratios and maturity.

Native fishery utilization was assessed at Barter Island and Nuiqsut (Colville River delta).

Assistance in lake and stream surveys was provided the fishery research team of Williams Brothers of Canada. Work was concentrated along the two proposed natural gas pipelines from Prudhoe Bay to Canada. Familiarity with the area was gained and critical fish habitat was identified. Fish surveys were conducted on the Canning and Kavik river drainages and lakes were surveyed in the Canning River delta.

The final phase of tagged char studies was begun this year in the Sagavanirktok River where 6,000 adult char have been tagged in the past two years.

A Study of a Typical Spring-Fed Stream of Interior Alaska — The demand for the excellent fishing and scenic values provided by Interior Alaskan spring-fed river systems is on the increase. Hence, the emphasis by the division to monitor and maintain these recreational values. This study of the Delta-Clearwater River, now at the end of full field season, was designed to bring to date information on the studies of fish species present, environmental conditions and angler utilization. Baseline data on fish presence, distribution, migration and abundance was collected as part of a continuing monitoring program.

Evaluation of Interior Waters with Emphasis on Managed Lakes — Now in its second year, this study is designed to provide information for more efficient management of Interior stocked waters. Post stocking policies of 13 lakes were appraised and intensive studies of stocking rates, timing, size and race of fish stocked and interspecies competition are underway to formulate stocking recommendations for optimum fish survival and growth. Various capture tools and techniques are being evaluated for efficiency in making population estimates.

Inventory and Cataloging of Interior Alaska Waters — Several ponds in the Fairbanks district were surveyed to determine potential for supporting a sport fishery. A 10-acre pond was chemically rehabilitated and subsequently stocked with silver salmon.

A small lake adjacent to Harding Lake was utilized as a rearing facility for silver salmon. Of 80,000 fingerlings stocked, 20,000 were trapped as yearling smolts and transferred to Harding Lake on an experimental basis to enhance the fishery there.

The species composition, grayling population level and size makeup were determined for the Chena River adjacent to Fairbanks and at the proposed Chena River flood control dam site as a continuation of an annual monitoring program for this heavily-used recreational river.

Population estimates of whitefish and sheefish were determined in the Chatanika River, which is the location of a major whitefish spear fishery during September and October. A spawning population of 21,000-24,000 whitefish was calculated.

Population Studies of Northern Pike and Whitefish in the Minto Flats and Chatanika River — In 1973, the Minto Flats pike-whitefish study continued to gather comparative data on northern pike and several species of whitefish both on movements and population dynamics. Information was collected on pike spawning and sport and subsistence utilization.

Distribution, Abundance, and Natural History of the Arctic Grayling in the Tanana River Drainage — Emphasis of the grayling project shifted to the Goodpaster River in 1973 because of a recent increase in angler usage related to property development along the river. An extensive tag and recapture program yielded information on population sizes and density over 115 miles of river. The relative abundance of other fish species was also determined.

A creel census carried out from the first of June through the first three days of September revealed about 310 boats using the river during this period. About 450 anglers fished slightly over 2,000 hours and caught 4,500 grayling of which 2,000 were kept.

A Life History Study of Sheefish and Whitefish in Alaska — During the second year of the life history study of sheefish of the middle Yukon River, 386 were tagged. Limited recovery of fish tagged in 1972 indicate little movement. Preliminary food habits analysis indicate that lampreys are the most important summer food item.

Search for sheefish spawning grounds located spawning sheefish 280 km up the Nowitna River in early September, 250 km up the Porcupine River in late September, and between Rampart and Stevens Village in the Yukon in late September. No definite spawning grounds were located nor were spawning observations made.

Whitefish studies emphasized distribution and taxonomic studies. Age and growth studies of humpback whitefish and the publishing of all information collected on the biology and ecology of the Bering cisco were completed. ■

STATEWIDE FISH STOCKING

Fish stocked, by species, in Regions I, II and III during 1973.

REGION	FISH SPECIES	NUMBER
I	Silver salmon	270,000
	King salmon	155,000
II	Arctic grayling	406,600
	Rainbow trout	905,700
	Silver salmon	946,000
	King salmon	160,000
III	Rainbow trout	359,700
	Silver salmon	415,500
	Arctic grayling	250,000
	TOTAL	3,868,500

DEPARTMENT OF FISH AND GAME

1973-74 Budget Authorizations

Administration	$ 1,335,900
Hatchery Services	476,800
Habitat	255,500
Commercial Fisheries	4,035,000
Game	2,628,200
Sport Fisheries	1,926,000
Vessels	515,600
Alaska King Crab Marketing & Quality Control Board	99,500
Fisheries Rehabilitation, Enhancement and Development	941,400
DEPARTMENT TOTAL	$12,213,900

GROSS SPORT FISH AND GAME LICENSE RECEIPTS 1964 THROUGH 1973

PREPARED JANUARY 18, 1974

STATE OF ALASKA
FISH & GAME LICENSING
DEPT. OF REVENUE
240 S. FRANKLIN
JUNEAU, ALASKA 99801

RECEIPT CODE NUMBER	TYPE OF LICENSE	1964 EARTH-QUAKE $	1965 $	1966 $	1967 $	1968 $	1969 $	1970 $	1971 $	1972 $	1973 $
401	R-FISHING	115,351	130,490	142,450	143,095	167,555	177,905	197,210	202,515	220,695	239,415
402	R-HUNTING	125,687	136,934	126,805	119,476	135,366	146,475	155,036	150,171	139,699	167,125
403	R-HUNT-TRAP	9,430	8,300	8,380	7,320	7,280	9,090	10,420	8,540	8,420	10,590
404	R-HUNT-FISH	172,560	183,732	179,016	182,712	210,252	227,328	275,412	308,232	331,500	359,244
405	R-HUNT-FISH-TRAP	31,860	29,460	33,225	32,340	35,850	44,025	59,325	62,505	65,805	80,145
406	NR-FISH 10-DAY	30,965	36,680	44,735	57,770	70,155	82,495	86,935	88,310	97,430	221,660
407	NR-FISH	82,530	107,000	106,390	132,200	158,200	175,530	207,900	184,050	192,690	287,480
408	NR-HUNT	39,190	48,340	51,160	58,930	68,150	78,170	90,040	80,330	80,670	141,320
409	NR-HUNT-FISH	21,620	28,880	33,400	36,400	47,400	54,500	70,120	69,520	71,840	65,560
410	NR-HUNT-TRAP	800	700	900	400	1,400	1,800	900	1,600	1,000	4,600
411*	MASTER-REG. GUIDE	12,300	14,200	13,850	16,600	17,950	17,250	17,300	17,600	18,950	11,650
412*	ASS'T GUIDE	735	545	770	1,195	1,945	2,215	2,290	2,775	2,475	330
413**	R-FUR DEAL TAXID	2,740	2,220	2,460	2,580	2,740	3,020	3,180	3,320	3,420	-0-
414**	NR-" " "	600	700	700	700	600	1,000	1,300	700	600	-0-
415	FUR-FISH-GAME FARM	30	30	35	50	35	40	80	105	90	400
419	"A" ASS'T GUIDE	-0-	-0-	-0-	-0-	-0-	-0-	520	650	790	180
420	DUP LICENSE	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	2,308	3,074
421	R-FUR DEALER	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	2,520
422	NR-FUR DEALER	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	200
423	R-TAXIDERMIST	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	2,700
424	NR-TAXIDERMIST	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	450
401-B	R-BLIND FISH	-0-	-0-	-0-	2	3	1	4	1	1	2
405-25¢	R-HUNT-FISH-TRAP	1,445	1,263	1,166	1,088	1,229	1,271	1,339	1,398	1,484	1,664
417-3B	R-TRAP	2,495	2,208	2,058	1,374	1,988	2,571	2,445	2,016	2,466	3,411
SUBTOTAL		650,338	731,682	747,500	794,232	928,098	1,024,686	1,181,756	1,184,338	1,242,333	1,603,720
416	GAME TAGS	183,320	236,445	290,545	303,510	346,350	384,975	424,415	393,840	404,410	753,625
TOTAL		833,658	968,127	1,038,045	1,097,742	1,274,448	1,409.661	1,606,171	1,578,178	1,646.743	2,357,345
401	R-FISHING	23,070	26,098	28,490	28,619	33,511	35,581	39,442	40,503	44,139	47,883
402	R-HUNTING	17,956	19,562	18,115	17,068	19,338	20,925	22,148	21,453	19,957	23,875
403	R-HUNT-TRAP	943	830	838	732	728	909	1,042	854	842	1,059
404	R-HUNT-FISH	14,380	15,311	14,918	15,226	17,521	18,944	22,951	25,686	27,625	29,937
405	R-HUNT-FISH-TRAP	2,124	1,964	2,215	2,156	2,390	2,935	3,955	4,167	4,387	5,343
406	NR-FISH 10-DAY	6,193	7,336	8,947	11,554	14,031	16,499	17,387	17,662	19,486	22,166
407	NR-FISH	8,253	10,700	10,639	13,220	15,820	17,553	20,790	18,405	19,269	14,374
408	NR-HUNT	3,919	4,834	5,116	5,893	6,815	7,817	9,004	3,033	8,067	7,066
409	NR-HUNT-FISH	1,081	1,447	1,670	1,820	2,370	2,725	3,506	3,476	3,592	1,639
410	NR-HUNT-TRAP	8	7	9	4	14	18	9	16	10	23
411	MASTER-REG. GUIDE	246	284	277	332	359	345	346	352	379	233
412	ASS'T GUIDE	79	109	154	239	389	443	458	555	495	66
413	R-FUR DEAL TAXID	137	111	123	129	137	151	159	166	171	-0-
414	NR-" " "	6	7	7	7	6	10	13	7	6	-0-
415	FUR-FISH-GAME FARM	6	6	7	10	7	8	16	21	18	4
419	"A" ASS'T GUIDE	-0-	-0-	-0-	-0-	-0-	-0-	52	65	79	18
420	DUP LICENSE	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	1,154	1,537
421	R-FUR DEALER	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	126
422	NR-FUR DEALER	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	2
423	R-TAXIDERMIST	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	54
424	NR-TAXIDERMIST	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	3
401-B	R-BLIND FISH	-0-	-0-	-0-	2	3	1	4	1	1	2
405-25¢	R-HUNT-FISH-TRAP	5,781	5,048	4,664	4,354	4,919	5,085	5,359	5,595	5,936	6,658
417-3B	R-TRAP	831	736	686	458	638	857	815	672	822	1,137
416	GAME TAGS	4,896	6,387	7,597	8,640	9,814	11,055	12,602	11,955	11,866	8,339
TOTAL SOLD EACH YEAR BY CLASS		89,909	100,777	104,472	110,463	128,810	141,861	160,058	159,644	168,301	171,544

GROSS COMMERCIAL FISH LICENSE RECEIPTS 1964 THROUGH 1973

STATE OF ALASKA
FISH & GAME LICENSING
DEPT. OF REVENUE
240 S. FRANKLIN
JUNEAU, AK 99801

CODE NO.	TYPE OF LICENSE	1964 EARTHQUAKE $	1965 $	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 $
270	Vessel	129,916.00	131,932.00	140,650.00	138,366.00	143,955.00	146,898.00	161,863.00	156,490.00	156,624.00	164,194.00
271	Troll	30,055.00	35,025.00	34,470.00	33,515.00	36,605.00	42,740.00	48,450.00	42,965.00	43,185.00	56,910.00
272	Long Line	9,850.00	11,935.00	19,830.00	15,770.00	9,620.00	18,530.00	29,740.00	29,260.00	33,075.00	52,005.00
273	Drift Gillnet	88,260.00	86,150.00	97,425.00	98,410.00	93,820.00	107,100.00	125,800.00	116,490.00	117,100.00	142,075.00
274	Set Gillnet	27,905.00	29,005.00	31,795.00	29,955.00	30,995.00	33,950.00	37,355.00	34,460.00	35,600.00	38,720.00
275	Beach Seine	485.00	1,490.00	700.00	725.00	600.00	975.00	1,075.00	1,210.00	1,175.00	1,385.00
276	Purse Seine	140,420.00	125,810.00	126,500.00	113,270.00	135,080.00	118,790.00	131,150.00	126,160.00	119,290.00	128,590.00
277	Beam Trawl	637.50	750.00	712.50	1,087.50	675.00	650.00	750.00	1,100.00	1,600.00	2,900.00
278	Otter Trawl	950.00	1,400.00	1,850.00	3,200.00	1,700.00	1,650.00	2,550.00	4,550.00	5,850.00	7,900.00
279	Shellfish Pots	14,115.00	10,365.00	11,175.00	12,060.00	14,970.00	17,430.00	18,225.00	14,415.00	17,685.00	29,025.00
280	Clam Diggers - 40% GF	330.00	364.00	246.00	290.00	336.00	290.00	382.00	670.00	928.00	904.00
281	R-Commercial - 40% GF	43,376.00	44,124.00	50,260.00	48,944.00	59,488.00	50,436.00	57,480.00	56,704.00	57,476.00	66,500.00
282	NR-Commercial- 40% GF	38,202.00	38,418.00	43,224.00	71,220.00	77,844.00	75,816.00	92,616.00	76,656.00	81,132.00	76,752.00
283	Scallop Dredges	-0-	-0-	-0-	-0-	-0-	2,500.00	900.00	350.00	350.00	250.00
286	Comm. Ext. Fees	-0-	-0-	-0-	-0-	-0-	-0-	1,665.00	2,925.00	2,970.00	6,750.00
SUBTOTAL		524,501.50	516,768.00	558,837.50	566,812.50	605,688.00	617,755.00	710,001.00	664,405.00	674,040.00	774,860.00
560)	60% To	495.00	546.00	369.00	435.00	504.00	435.00	573.00	1,005.00	1,392.00	1,356.00
561)	Fishermen's	65,064.00	66,186.00	75,390.00	73,416.00	89,232.00	75,654.00	86,220.00	85,056.00	86.214.00	99,750.00
562)	Fund	57,303.00	57,627.00	64,836.00	106,830.00	116,766.00	113,724.00	138,924.00	114,984.00	121,698.00	115,128.00
SUBTOTAL		122,862.00	124,359.00	140,595.00	180,681.00	206,502.00	189,813.00	225,717.00	201,045.00	209,304.00	216,234.00
TOTAL		647,363.50	641,127,00	699,432.50	747,493.50	812,190.00	807,568.00	935,718.00	865,450.00	883,344.00	991,094.00
	NUMBER OF LICENSES SOLD EACH YEAR										
270	Vessel	8,680	8,811	9,370	9,639	9,926	9,972	10,877	10,710	10,791	11,777
271	Troll	1,735	1,922	1,944	1,889	2,103	2,303	2,567	2,353	2,413	3,190
272	Long Line	326	419	733	556	342	700	1,109	1,074	1,221	1,918
273	Drift Gillnet	3,219	3,257	3,654	3,765	4,050	4,374	4,710	4,779	4,611	6,425
274	Set Gillnet	2,594	2,629	2,845	2,610	2,708	3,011	3,053	3,062	3,112	3,504
275	Beach Seine	23	44	40	38	38	64	77	86	81	91
276	Purse Seine	1,343	1,237	1,236	1,202	1,291	1,207	1,311	1,323	1,147	1,341
277	Beam Trawl	17	20	19	24	18	13	13	16	32	54
278	Otter Trawl	9	12	17	38	26	30	41	67	87	106
279	Shellfish Pots	456	355	425	474	524	593	617	576	605	959
280	Clam Diggers	131	114	102	127	148	135	149	237	336	356
281	Res Commercial	10,844	11,052	12,565	12,236	14,872	12,609	14,370	14,176	14,369	16,625
282	Non-Res Commercial	6,367	6,403	6,847	5,936	6,487	6,318	7,718	6,388	6,761	6,396
283	Scallop Dredges	-0-	-0-	-0-	-0-	-0-	18	8	7	5	5
286	Comm. Ext. Fees	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
TOTAL		35,744	36,275	39,797	38,534	42,533	41,347	46,620	44,854	45,571	52,747