US FISH & WILDLIFE SERVICE--ALASKA
3 4982 00028086 6

FWLB
1230

ANADROMOUS FISH INVENTORY

TOGIAK NATIONAL WILDLIFE REFUGE, ALASKA
and Associated Area of Ecological Concern

Prepared for

Fish and Wildlife Service

by

Arctic Environmental Information and Data Center

University of Alaska, Anchorage

September 1975

Merged With
A.R.L.I.S.
ANCHORAGE, ALASKA
Est. 1997
Library U.S. Fish & Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503

ARLIS
Alaska Resources
Library & Information Services
Anchorage, Alaska

References

Togiak National Wildlife Refuge

Anadromous Fish Inventory

Alaska. Department of Fish and Game. 1967. Compilation of Catch Escapement Data of Nushagak and Togiak District, King, Chum, Pink and Coho Salmon, Bristol Bay, 1966. Informational Leaflet no. 107.

_____. 1973. Annual Management Report, 1972. Bristol Bay Area. Division of Commercial Fisheries, Anchorage. 40 p.

_____. 1975. Catalog of Waters Important for Spawning and Migration of Anadromous Fishes. Region 3. Region 2 and 4. Juneau.

Atkinson, C.E., J.H. Rose, and T.O. Duncan. 1967. Pacific salmon in the United States in Salmon of the North Pacific Ocean--Part IV. Spawning Populations of North Pacific Salmon. International North Pacific Fisheries Commission. Bulletin no. 23. pp. 43-223.

Baxter, R.E. 1971. Quinhagak Tagging Program, 1969-1970. Alaska. Department of Fish and Game. Arctic-Yukon-Kuskokwim Region Fishery Bulletin no. 6. 14 p.

Biwer, D.A. 1969. Bristol Bay Gear License Statistics, 1929-67--A Preliminary Report. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 12. 39 p.

Biwer, D.A. and M.L. Nelson. 1969. Status of the Bristol Bay Salmon Fishery. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 21. 22 p.

Church, W. 1963a. Red Salmon Spawning Ground Survey in the Nushagak and Togiak Districts, Bristol Bay, 1960. Alaska. Department of Fish and Game. Informational Leaflet no. 29. 14 p.

_____. 1963b. Red Salmon Spawning Ground Survey in the Nushagak and Togiak Districts, Bristol Bay, 1961. Alaska. Department of Fish and Game. Informational Leaflet no. 30. 23 p.

Church, W. and M.L. Nelson. 1963. Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts Bristol Bay, 1962. Alaska. Department of Fish and Game. Informational Leaflet no. 34.

Governor's Limited Entry Study Group. 1973. Extracts from a Limited Entry Program for Alaska's Fisheries. Juneau. 307 p.

Hart, J.L. 1973. Pacific Fishes of Canada. Fisheries Research Board of Canada. Bulletin no. 180. 740 p.

International North Pacific Fisheries Commission. 195_-1973. Statistical Yearbook (1952-1971). Vancouver, B.C.

Knudson, B., P.H. Poe, and O.A. Mathisen. 1972. A Data File for the Bristol Bay Sockeye Salmon Fishery. Fisheries Research Institute, University of Washington, Seattle. Circular no. 72-9.

Krasnowski, P. and R. Randall. 1975. Bristol Bay Sockeye Salmon (Oncorhynchus nerka) 1972. A Compilation of Catch and Escapement Data. Alaska. Department of Fish and Game. Technical Data Report no. 19. 67 p.

Mathisen, O.A. and S. Pennoyer. 1968. Bristol Bay Red Salmon (Oncorhynchus nerka), 1967. A Compilation of the Catch and Escapement Data. Alaska. Department of Fish and Game. Informational Leaflet no. 121.

Mattson, C.R. 1962. Chum Salmon Resources of Alaska from Bristol Bay to Point Hope. U.S. Fish and Wildlife Service. Special Scientific Report-Fisheries no. 425. 22 p.

McCurdy, M.L. and R. Paulus. 1972. Bristol Bay Sockeye Salmon (Oncorhynchus nerka) 1968. A Compilation of Catch and Escapement Data. Alaska. Department of Fish and Game. Technical Data Report no. 1. 107 p.

McCurdy, M.L. and T.R. Schroeder. 1972. Bristol Bay Sockeye Salmon (Oncorhynchus nerka) 1971. A Compilation of Catch and Escapement Data. Alaska. Department of Fish and Game. Technical Data Report no. 7. 102 p.

McPhail, J.D. and C.C. Lindsey. 1970. Freshwater Fishes of Northwestern Canada and Alaska. Fisheries Research Board of Canada. Bulletin no. 173.

Metsker, H. 1967. Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1964. Alaska. Department of Fish and Game. Informational Leaflet no. 108. 37 p.

Nelson, M.L. 1965a. Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1963. Alaska. Department of Fish and Game. Informational Leaflet no. 61.

_____. 1965b. A Compilation of Notes and Biological Data from the Nushagak and Togiak Districts, Bristol Bay, 1956-64. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 1. 49 p.

_____. 1965c. A Compilation of Notes and Biological Data from the Nushagak and Togiak Districts, Bristol Bay, 1965. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 2. 40 p.

_____. 1966. Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1965. Alaska. Department of Fish and Game. Informational Leaflet no. 84.

_____. 1967a. Red Salmon Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1966. Alaska. Department of Fish and Game. Informational Leaflet no. 96.

_____. 1967b. Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1967. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 4. 13 p.

_____. 1968a. Compilation of Catch and Escapement Data of Nushagak and Togiak District--King, Chum, and Coho Salmon. Alaska. Department of Fish and Game. Informational Leaflet no. 122.

_____. 1968b. Spawning Ground Surveys in the Nushagak and Togiak Districts, Bristol Bay, 1968. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 5. 17 p.

_____. 1969. Summary of Chum and Coho Salmon Stocks in the Togiak District of Bristol Bay. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 16. 17 p.

_____. 1970a. Spawning Ground Surveys in the Nushagak and Togiak Districts of Bristol Bay, 1969. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 23. 29 p.

_____. 1970b. Studies of Bristol Bay Fishery Resources. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 25. 91 p.

_____. 1970a. Spawning Ground Surveys in the Nushagak and Togiak Districts of Bristol Bay, 1970. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 26. 20 p.

_____. 1971. Spawnging Ground Surveys in the Nushagak and Togiak Districts of Bristol Bay, 1971. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 33. 16 p.

_____. 1972a. Spawning Ground Surveys in the Nushagak and Togiak Districts of Bristol Bay, 1972. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 34. 27 p.

_____. 1972b. Compilation of Catch and Escapement Data of Nushagak and Togiak District King, Chum, Pink and Coho Salmon, 1969, 1970 and 1971. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 40. 56 p.

Nelson, M.L. and D.A. Biwer. 1969. Compilation of Notes and Biological Data from the Nushagak and Togiak Districts, Bristol Bay, 1967-68. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 9. 34 p.

Nelson, M.L. et al. 1973. Subsistence Fishing in the Naknek-Kvichak, Nushagak and Togiak Districts of Bristol Bay. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 19. 29 p.

Paddock, A.D. 1964. Inventory and cataloging of the sport fish and sport fish waters in the Bristol Bay and Lower Kuskokwim drainages in Annual Report of Progress, 1963-1964. Federal Aid in Fish Restoration. Sport Fish Investigations of Alaska. Alaska. Department of Fish and Game. Project F-5-R-5, Job 4-A. pp. 63-93.

_____. 1965. Inventory and cataloging of the sport fish and sport fish waters in Bristol Bay and Lower Kuskokwim drainages in Annual Report of Progress, 1964-1965. Federal Aid in Fish Restoration. Sport Fish Investigations of Alaska. Alaska. Department of Fish and Game. Project F-5-R-6, Job 12-A. pp. 231-247.

Paulus, R.D. 1967. Bristol Bay Red Salmon (Oncorhynchus nerka) 1966--A Compilation of the Catch and Escapement Data. Alaska. Department of Fish and Game. Informational Leaflet no. 94.

Paulus, R.D. and M.L. Nelson. 1972a. Bristol Bay Sockeye Salmon (Oncorhynchus nerka) 1969. A Compilation of Catch and Escapement Data. Alaska. Department of Fish and Game. Technical Data Report no. 5. 91 p.

Paulus, R.D. and M.L. Nelson.1972b. Bristol Bay Sockeye Salmon (Oncorhynchus nerka) 1970. A Compilation of Catch and Escapement Data. Alaska. Department of Fish and Game. Techncial Data Report no. 6. 112 p.

Pennoyer, S. and M.C. Seibel, eds. 1965. Bristol Bay Red Salmon, 1964. A Compilation of the Catch and Escapement Data. Alaska. Department of Fish and Game. Informational Leaflet no. 45. 181 p.

Pennoyer, S. and M.C. Seibel, eds. 1966. Bristol Bay Red Salmon (Oncorhynchus nerka), 1965. A Compilation of the Catch and Escapement Data. Alaska. Department of Fish and Game. Informational Leaflet no. 75. 115 p.

Poe, P.H. and O.A. Mathisen. 1973. Bristol Bay data file in 1972 Research in Fisheries. Fisheries Research Institute, University of Washington, Seattle. Contribution no. 375. pp. 13-15.

Quast, J.C. and E.L. Hall. 1972. List of Fishes of Alaska and Adjacent Waters with a Guide to Some of Their Literature. National Marine Fisheries Service. Special Scientific Report-Fisheries no. 658.

Raleigh, R.F. 1958. Reconnaissance of Salmon Fisheries Between Cape Newenham and Point Hope, Alaska, 1957. National Marine Fisheries Service, Auke Bay Laboratory Manuscript Report-File no. 85.

Scott, W.B. and E.J. Crossman. 1973. Freshwater Fishes of Canada. Fisheries Research Board of Canada. Bulletin no. 184. 966 p.

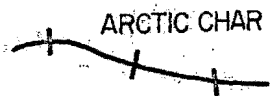
Siedelman, D.L. 1967. A Compilation of Notes and Biological Data from the Nushagak and Togiak Districts, Bristol Bay, 1966. Alaska. Department of Fish and Game. Bristol Bay Data Report no. 3. 21 p.

Siniff, D.B., ed. 1964. Bristol Bay Red Salmon, 1963. A Compilation of the Catch and Escapement Data. Alaska. Department of Fish and Game. Informational Leaflet no. 35. 183 p.

Stefanich, F. 1973. Resources Inventory--Southwest Region. Resource Planning Team, Joint Federal-State Lane Use Planning Commission for Alaska, Anchorage. 14 p.

Straty, R.R. 1974. Ecology and behavior of juvenile sockeye salmon (Oncorhynchus nerka) in Bristol Bay and the eastern Bering Sea in Oceanography of the Bering Sea. D.W. Hood and F.J. Kelley, eds. Institute of Marine Science, University of Alaska, Fairbanks. Occasional Publication no. 2. pp. 285-320.

_____. In preparation. Migratory pattern of adult sockeye salmon (Oncorhynchus nerka) in Bristol Bay as related to the distribution of their home-river waters. Fishery Bulletin. (not seen).



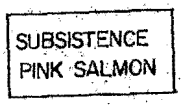
Anadromous Fish Stream with Identified Species



Key Spawning or Rearing Area



Key Area Value for Identified Species



Significant Harvest Locale
with Important Species Named

SELAWIK NWR — Proposed Refuge Name

Boundary of Proposed Refuge
and Area of Ecological Concern

Existing Refuge Boundary

Fisheries Research Station

Airfield

Mineral Location

Hydroelectric Dam Site

Oil or Gas Well

Anadromous Fish Inventory
Information Framework

a. Bibliography

The files of the Arctic Environmental Information and Data Center were utilized for the compilation of an initial bibliography. Referenced titles were then obtained and citations pertaining to the area and species of interest which appeared in these reports were added to expand the initial bibliography. References were deleted if, when obtained, the study was not found to pertain to the area or species of interest. In a few cases where references were unobtainable, such citations are followed by the note "(not seen)" to indicate that any pertinent data contained in this reference is not included in the remainder of the inventory.

All possible reference sources are listed with the exception of those containing extremely general subject matter, most early (before 1910) exploratory reports, and annual report series such as Alaska Fishery and Fur-Seal Industries in (year) which were issued prior to 1960.

b. Species Lists

A list of anadromous and coastal marine fishes for each proposed refuge or proposed additions to existing refuges was compiled. An initial list was taken from each final environmental statement; however, three major taxonomic references were consulted to add to, or delete from this initial list - List of Fishes of Alaska and Adjacent Waters with a Guide to Some of Their Literature (Quast and Hall 1972), Pacific Fishes of Canada (Hart 1973), and Freshwater Fishes of Canada (Scott and Crossman 1973). Species on the lists which were considered to be coastal marine inhabitants were verified with A List of Common and Scientific Names of Fishes from the United States and Canada (Bailey

et al. 1970). However, further studies of certain families of fishes inhabiting Alaskan waters are needed - e.g. Cottidae - since some species have not been included in the American Fisheries Society list because their taxonomic status has not been determined. Species which have been included in some of the earlier ichthyological literature and have not recently been verified are not included in the present lists.

An anadromous species was considered to be one which spawns in fresh water, and at some point in its early life cycle, undergoes a migration to salt or brackish water. In some regions (Koyukuk, Yukon Flats) a non-migratory form of an anadromous species (inconnu, some whitefish) was determined from the literature, and therefore, this species was not included in the list. Coastal marine species were considered to be residents of nearshore neritic, lagoon, or estuarine habitats. Species which generally inhabit fresh water, but have been found to enter coastal, brackish water, were included as coastal marine forms and were indicated thus - e.g. ninespine stickleback.

c. Histories of Commercial, Sport, and Subsistence Fisheries

Historical references were consulted as well as management reports and periodicals for any data which document the commercial, sport, or subsistence utilization of anadromous fish within the boundaries of ecological concern for each proposed refuge. Knowledgeable research and management personnel with state and federal agencies also were consulted to provide additional unpublished data. In many refuge areas, historical information was sparse. However, considerable use was made of descriptions of subsistence life styles documented in Alaska Natives and the Land (Federal Field Committee 1968). Sport and commercial historical information was largely

taken from Alaska Department of Fish and Game publications.

Each refuge historical summary is a brief description of trends of activity rather than a year-by-year account. For example, some publications have traced the history of cannery operation in a particular region and have indicated when and where each company began or ceased operation. These types of data were synthesized into a general account of the contribution and significance of cannery operation in that area. Significant sources of information are appropriately referenced.

d. Habitat

Anadromous fish habitat was regularly calculated to the most upstream record for any species. All habitat, except the largest lakes, was measured in linear statute miles from drainage mouth to most upstream record using a fine string to follow the main channel as charted on standard U.S. Geological Survey 1:250,000 scale quadrangle sheets. For major lakes, habitat areas are recorded in square miles.

For major rivers such as the Yukon, Kobuk and Kuskokwim, standard mileage reference points utilized by the Alaska Department of Fish and Game were used.

In the Wood River and Kvichak River drainages, extensive spawning ground catalogs have been published (Demory, Orrell and Heinle 1964; Marriott 1963). In these two systems linear miles of habitat are taken directly from these previous calculations.

In the tabular record of this data, tributaries are listed immediately following and indented from the larger watercourse into which they flow. Each refuge listing begins at the northwesternmost corner of the area of interest.

Where species are not known but anadromous fish are recorded as present (Alaska Department of Fish and Game 1975), waterways are so indicated. All other systems are recorded by species present. A series of annotated U.S. Geological Survey quadrangles compiled by the Alaska Department of Fish and Game, Habitat Division, was helpful in clarifying certain habitat areas and species.

e. Key Spawning and Rearing Areas

This section is one of the weakest of this report. Almost all information came from Atkinson, Rose and Duncan (1967) except for the excellent data in the spawning ground catalogs for the Wood River and Kvichak River drainages (Demory, Orrell and Heinle 1964; Marriott 1963). Little other compiled information exists and that in Atkinson, Rose and Duncan (1967) was, at times, found to be questionable in its accuracy--for example, the existence of spawning grounds in the main channels of the lower Yukon River and above the Tazimina River falls in the Lake Iliamna area is suspect.

Areas of major lakes which are prime rearing areas for sockeye salmon, are recorded in square miles. In the Wood River and Kvichak River drainages, spawning grounds are measured in both linear miles of waterway and in acres of utilized or potentially utilizable area.

Tabular data, including the method of listing tributaries, is handled in the same manner as the habitat information.

f. Runs/Escapement

Escapement counts or estimates of total spawning run were obtained almost entirely from Alaska Department of Fish and Game management reports and surveys conducted by the University of Washington's Fisheries Research

Institute on the Kvichak River and Wood River drainages. These counts are a variety of weir, aerial and tower counts and are so indicated. In a few cases, population estimates from tagging studies are available.

g. Harvest Data

Harvest includes separate statistics for the subsistence, commercial and sport fisheries. Data are in numbers of fish as reported to the managing agency.

Harvest data were obtained almost entirely from Alaska Department of Fish and Game management reports and International North Pacific Fisheries Commission Statistical Yearbooks. Where possible, commercial harvest data are tabulated by statistical district sub-units. Often such detail is not readily accessible, and data are portrayed by entire statistical district. Subsistence data are listed by village or by statistical district. Sport harvest data are almost nonexistent except for a few selected survey sites in the Kvichak River and Naknek River drainages.

h. Effort

Effort includes the amount of gear used, number of licenses and time fished where these data are available. Commercial effort is moderately documented while little sport and subsistence effort is available.

Effort information has been derived almost entirely from Alaska Department of Fish and Game management reports. The statistical divisions used in reporting the data vary. In some cases, entire areas may not have been subdivided for effort statistics, while in other parts of the state, this information is available by statistical district or even subdistrict.

Value of catch to the fisherman has been calculated from "price per fish" data provided in Alaska Department of Fish and Game management reports.

i. Mylar Overlays

The following information was plotted on mylar overlays of U.S. Geological Survey 1:250,000 scale quadrangles:

1. All waterways inhabited by anadromous fish are indicated to their most upstream record of any species of interest.

2. Anadromous inhabitants are named for all waterways where present.

3. Spawning and rearing areas are identified and are rated in value for each species. This rating is most often based on a minimum of data and should be used with extreme care and recognition that, at most, only the relative abundance of spawners utilizing such an area is indicated. Where data for salmon are more readily available, a low rating indicates a spawning population of less than 5,000 fish; a medium rating indicates a spawning population of between 5,000 and 20,000 fish; and a high rating indicates in excess of 20,000 spawners may regularly use such an area. Much of the information base for this section was obtained from escapement statistics reported in Alaska Department of Fish and Game management reports and in Demory, Orrell and Heinle (1964) and Marriott (1963).

4. Recorded harvest areas are indicated as commercial, sport or subsistence along with major species harvested. Again, much of this information involved the interpretation of data presented in Alaska Department of Fish and Game management reports.

5. All operating or recently operating federal or state research research stations or field sites are plotted.

6. Various activities which might become sources of impact on the fisheries resources were plotted including potential gas pipeline stream crossings (Arctic National Wildlife Refuge), oil and gas wells (Arctic

National Wildlife Refuge), potential dam sites, existing airfields, and locations of mineral occurrence of potential economic value including concentrations of existing mineral claims.

j. Statewide Mylar Overlay of Major Anadromous Fish Streams

"Major" is defined as having a regular run of the indicated species in excess of 50,000 fish. Primary data for this section was obtained from Atkinson, Rose and Duncan (1967).

Coastal Marine and Anadromous Fish
Togiak National Wildlife Refuge

(o)	Pacific lamprey	Entosphenus tridentatus
(o)	Arctic lamprey	Lampetra japonica
	Salmon shark	Lamna ditropis
	Pacific sleeper shark	Somniosus pacificus
	Spiny dogfish	Squalus acanthias
	Big skate	Raja binoculata
	Black skate	Raja kincaidi
	Starry skate	Raja stellulata
	Pacific herring	Clupea harengus pallasi
o	Bering cisco	Coregonus laurettae
o	**Pink salmon**	Oncorhynchus gorbuscha
o	Chum salmon	Oncorhynchus keta
o	Coho salmon	Oncorhynchus kisutch
o	Sockeye salmon	Oncorhynchus nerka
o	Chinook salmon	Oncorhunchus tshawytscha
*	Round whitefish	Prosopium cylindraceum
(o)	Arctic char	Salvelinus alpinus
(o)	Dolly Varden	Salvelinus malma
o	Pond smelt	Hypomesus olidus
	Capelin	Mallotus villosus
(o)	Rainbow smelt	Osmerus eperlanus
o	Eulachon	Thaleichthys pacificus
	Saffron cod	Eleginus gracilis
	Pacific cod	Gadus morhua macrocephalus
	Walleye pollock	Theregra chalcogramma
	Alaska eelpout	Bothrocara pusillum
	Fish doctor	Gymnelis viridis
	Shortfin eelpout	Lycodes brevipes
	Black eelpout	Lycodes diapterus
	Wattled eelpout	Lycodes palearis
*	Threespine stickleback	Gasterosteus aculeatus
*	Ninespine stickleback	Pungitius pungitius
	Pacific sandfish	Trichodon trichodon
	Searcher	Bathymaster signatus
	Northern ronquil	Ronquilus jordani
	Pighead prickleback	Acantholumpenus mackayi
	Decorated warbonnet	Chirolophis polyactocephalus
	Slender eelblenny	Lumpenus fabricii
	Stout eelblenny	Lumpenus medius
	Snake prickleback	Lumpenus sagitta
	Ribbon prickleback	Phytichthys chirus
	Whitebarred blenny	Poroclinus rothrocki
	Banded Gunnel	Pholis fasciata
	Bering gunnel	Pholis gilli
	Crescent gunnel	Pholis laeta
	Saddleback gunnel	Pholis ornata
	Bering wolffish	Anarhichas orientalis
	Quillfish	Ptilichthys goodei

	Graveldiver	Scytalina cerdale
	Pacific sand lance	Ammodytes hexapterus
	Pacific Ocean perch	Sebastes alutus
	Silvergray rockfish	Sebastes brevispinis
	Dusky rockfish	Sebastes ciliatus
	Darkblotched rockfish	Sebastes crameri
	Blackgill rockfish	Sebastes melanostomus
	Northern rockfish	Sebastes polyspinis
	Redstripe rockfish	Sebastes proriger
	Sablefish	Anoplopoma fimbria
	Masked greenling	Hexagrammos octogrammus
	Whitespotted greenling	Hexagrammos stelleri
	Atka mackerel	Pleurogrammus monopterygius
	Scaled sculpin	Archaulus biseriatus
	Crested sculpin	Blepsias bilobus
	Silverspotted sculpin	Blepsias cirrhosus
*	Sharpnose sculpin	Clinocottus acuticeps
	Calico sculpin	Clinocottus embryum
*	Coastrange sculpin	Cottus aleuticus
	Spinyhead sculpin	Dasycottus setiger
	Antlered sculpin	Enophrys diceraus
	Unnamed cottid	Eurymen gyrinus
	Armorhead sculpin	Gymnocanthus galeatus
	Threaded sculpin	Gymnocanthus pistilliger
	Red Irish lord	Hemilepidotus hemilepidotus
	Yellow Irish lord	Hemilepidotus jordani
	Northern sculpin	Icelinus borealis
	Twohorn sculpin	Icelus bicornis
	Spatulate sculpin	Icelus spatula
	Blackfin sculpin	Malacocottus kincaidi
	Plain sculpin	Myoxocephalus jaok
	Warthead sculpin	Myoxocephalus niger
	Great sculpin	Myoxocephalus polyacanthocephalus
	Shorthorn sculpin	Myoxocephalus scorpius
	Eyeshade sculpin	Nautichthys pribilovius
	Tidepool sculpin	Oligocottus maculosus
	Spineless sculpin	Phallocottus obtusus
	Grunt sculpin	Rhamphocottus richardsoni
	Kelp sculpin	Sigmistes caulias
	Arched sculpin	Sigmistes smithi
	Scissortail sculpin	Triglops forficata
	Roughspine sculpin	Triglops macellus
	Ribbed sculpin	Triglops pingeli
	Spectacled triglops	Triglops scepticus
	Sturgeon poacher	Podothecus acipenserinus
	Aleutian alligatorfish	Aspidophoroides bartoni
	Gray starsnout	Asterotheca alascana
	Spinycheek starsnout	Asterotheca infraspinata
	Bigeye poacher	Asterotheca pentacanthus
	Blackfin poacher	Bathyagonus nigripinnis

Fourhorn poacher	Hypsagonus quadricornis
Bering Poacher	Occella dodecaedron
Warty poacher	Occella verrucosa
Tubenose poacher	Pallasina barbata
Sawback poacher	Sarritor frenatus
Longnose poacher	Sarritor leptorhynchus
Smooth lumpsucker	Aptocyclus ventricosus
Pacific spiny lumpsucker	Eumicrotremus orbis
Spotted snailfish	Liparis callyodon
Ribbon snailfish	Liparis cyclopus
Tidepool snailfish	Liparis florae
Unnamed cyclopterid	Liparis megacephalus
Showy snailfish	Liparis pulchellus
Ringtail snailfish	Liparis rutteri
Tadpole snailfish	Nectoliparis pelagicus
Arrowtooth flounder	Atheresthes stomias
Rex sole	Glyptocephalus zachirus
Flathead sole	Hippoglossoides elassodon
Pacific halibut	Hippoglossoides stenolepis
Butter sole	Isopsetta isolepis
Rock sole	Lepidopsetta bileneata
Yellowfin sole	Limanda aspera
Longhead dab	Limanda proboscidea
Dover sole	Microstomus pacificus
Starry flounder	Platichthys stellatus
Alaska plaice	Pleuronectes quadrituberculatus

(o) Anadromous
o Both anadromous and resident
* May enter coastal, brackish water

History of Subsistence Fishery
Togiak National Wildlife Refuge, Alaska

In early years anadromous fish were probably very important as a staple, but no more important than game or plants (Rostlund 1952). The annual cycle of subsistence activities by the Togiagmiut Eskimo in early years was much the same as for other Bristol Bay Natives. Seasonal movements were made between the coastal marine habitat and interior riverine habitats. Salmon, whitefish and trout were taken in season at village sites or at traditional fish camps. Along the coast some use was made of marine fishes. Aboriginal fishing methods by Togiak area Eskimos included tidal fish traps, harpoons, hook and line, and nets. Fish were preserved by salting or air drying for later human consumption or as dog food, and may have been preserved by burial to allow the fish flesh to undergo partial decomposition for the purpose of making a delicacy or seasoning (Rostlund 1952).

In recent years the subsistence catches of salmon for personal use and dog food have been recorded since 1963 in the Bristol Bay area. In the Togiak District, the average annual salmon harvest for subsistence purposes from 1963 to 1971 ranged from 5,000 to 10,000 fish. Also in recent years in the Togiak area, heavy reliance was placed upon sea-run char, which apparently winter in the Togiak River. Approximately 100,000 Arctic char are harvested annually in the Togiak River, utilizing small mesh gill nets, principally from September through May. Therefore salmon rank second in quantity

harvested for subsistence purposes, almost all of which originate from the Togiak River drainage. Considerable winter fishing through the ice occurs in all Bristol Bay districts, with residents harvesting arctic char, whitefish, pike, burbot, some rainbow trout, and grayling.

History of Commercial Fishery
Togiak National Wildlife Refuge, Alaska

Waters within the boundaries of the area of ecological concern for the proposed Togiak National Wildlife Refuge have been fished for salmon commercially since 1954. From this date, the primary commercial emphasis was placed upon sockeye salmon of the Togiak River. However, little information is available documenting the history of commercial fishing activities within this region. Most of the recorded information pertains to the Bristol Bay region as a whole. The Togiak River and its drainages fall within one of the five districts in Bristol Bay--the Togiak District.

The Togiak District at present is divided into five sections: Cape Pierce, Osviak, Matogak, Togiak, and Kulukak. Two other sections were named and fished prior to 1968, namely the Ungalikthluk and Nunavarchak sections. However, these two areas have not been fished since 1968 (Nelson 1969). The majority of the commercial harvest of salmon has occurred within the Togiak section of the Togiak District. Although the Togiak District has been fished commercially since the mid-1950s, the Kulukak section was first fished in 1961 (Nelson 1969). Other sections within the Togiak District have never been fished commercially with the exception of minor effort in 1961 in the Osviak and Matogak section. After 1966 considerably more effort has been expended fishing for salmon within these two sections. The Cape Pierce section was fished on a trial basis in 1967, but has not been fished since.

Two salmon processing companies presently operate in the Togiak area. These are the Red Salmon Company and Togiak Fisheries

Inc., which are located near the mouth of the Togiak River. In 1968 a small salting station was operated in the area by Alaskan Smokey joe's, Inc. of Anchorage.

Commercial salmon fishing in Togiak waters was accomplished primarily by drift and set gill nets. Fishing in this region is participated in primarily by residents, with a trend towards fewer gear in recent years--116 units of gill net in 1972. Management of the commercial salmon fishery within the Togiak District operated under a different concept than management in the other four districts of the Bristol Bay area. In the Togiak area, fishing periods were set in advance, and adjusted as required during the course of the season.

In addition to salmon, other species have also been harvested in the Togiak area. In 1969 a small commercial fishery for whitefish existed on Okstukuk Lake, a headwater lake to the Kokwok River, a Nushagak River tributary. This fishery occurred primarily during November and December, taking predominantly whitefish (88 percent of the catch), with the remainder of the catch probably burbot. In 1967 the first effort at commercially harvesting herring occurred in the Togiak area, with the catch being processed for sac roe. In 1968 a small operation also commercially harvested herring spawn-on-kelp. Gear utilized in the herring operation was primarily small purse seine, although some gill nets were also employed. The herring spawn-on-kelp commercial fishery harvested two species of marine algae: rockweed (Fucus furcatus) and sugarwrack

(Laminaria saccharina). Markets for both herring spawn-on-kelp and herring sac roe were primarily Japanese.

Also enclosed within the proposed area of ecological concern are two subdistricts of the Kuskokwim District. Subdistrict 335-40 includes approximately five miles of shoreline adjacent to the village of Quinhagak at the mouth of the Kanektok River, and subdistrict 335-50, which includes Goodnews Bay. Salmon products processed in the Togiak District include canned, fresh, frozen or cured fish.

History of Sport Fishery
Togiak National Wildlife Refuge, Alaska

Very little information is available which documents early sport fishing activities in the Togiak area. Sport fishing activities probably were not significant until the advent of air travel, and even recently, have centered only in the Togiak Village area or upper Togiak River.

Anadromous Species Abbreviations

AL = Arctic lamprey

AC = Arctic char

PS = Pink salmon

CS = Chum salmon

RS = Sockeye salmon

KS = King salmon

SS = Coho salmon

In = Inconnu

BWF = Broad whitefish

ACI = Arctic cisco

LC = Least cisco

WF = Whitefish (species unidentified)

RBS = Rainbow smelt

BC = Bering cisco

UN = Species unidentified

Anadromous Fish Habitat
Togiak National Wildlife Refuge
and Associated Areas of Ecological Concern

Drainage Name	Anadromous Species (Habitat in miles)								
	KS	PS	CS	SS	RS	AC	UN		
Nushagak River	(NOT IN THIS REFUGE)								
Wood River					15				
Unnamed Creek					3	X			
Sunshine Valley River	X	X	X		9	X			
Youth Creek		X	X		3				
Snake River					4				
Killian Creek					4				
Weary River	10	10		X					
Igushik River	18	18	18	18	18	18			
Tuklung River			10						
Lake Amanka					X	X			
Longhorn Creek					6				
Unnamed Creeks					3				
Kathleen River					8	X			
Ongake River					15				
Unnamed Creek					8				
Unnamed Creek					2				
Ualik Lake					X				
Francis Creek					10				
Unnamed Creeks					7				
Kanik River		X	7		7				
Tithe Creek T. The Creek Ponds			8		3				
Kulukak River	X	30	30	25	25	X			
Unnamed Creek							X		
Metervik Bay Creek		5							

Continued

Anadromous Fish Habitat
Togiak National Wildlife Refuge
and Associated Areas of Ecological Concern

Drainage Name	Anadromous Species (Habitat in miles)								
	KS	PS	CS	SS	RS	AC	UN		
Right Hand Point Creek			5						
Ungalukthluk River	X		12		20				
Nukayachagak Creek	20		20						
Togiak River	80	42	30	80	82	85			
Gechiak Creek	4		15	15	22	15			
Unnamed Creek	8				8				
Pungokepuk Creek	X		9		18				
Unnamed Creek							X		
Kashaiak River	5	8	14	16					
Nagugun Creek			3	3					
Narogurum River	X		X	X	30				
Ongivinuck River	X		15	15	30	30			
Kipnuktuli Creek	10								
Togiak Lake	X			X	X				
Unnamed Creeks					15				
Trail Creek	10			10	1 12				
Izavieknik River					10				
Kurtluk River			X						
Quigmy River			12		X				
Matogak River			23		X				
Nisua River							X		
Osviak River			28		X				
Unnamed Creek			6						

Continued

Anadromous Fish Habitat
Togiak National Wildlife Refuge
and Associated Areas of Ecological Concern

Drainage Name	Anadromous Species (Habitat in miles)								
	KS	PS	CS	SS	RS	AC	UN		
North Hagemeister Creek			X						
South Hagemeister Creek			X						
Salmon River			X		X				
Smalls River			X						
Goodnews River	32		30	45	70	X			
Barnum Creek				5					
Canyon Creek	X			4	12				
Awayak Creek					10				
UNNAMED CREEK					3				
Middle Fork			15		47				
Kukaktlim River					22				
South Fork			20						
Tunulik River					11				
Carter Creek			12						
Indian River			4		X				
North Fork			5						
Nautilus Creek			2						
Cripple Creek			8		11				
Jacksmith Creek			10		X				
Arolik - North Mouth			8						
Arolik - South Mouth			12	28	30				
Faro Creek							X		
East Fork					10				
Kanektok River	40	X	65	85	90	X			
Takshilik Creek							X		
NUKIUK CREEK				5					

Continued

Anadromous Fish Habitat
Togiak National Wildlife Refuge
and Associated Areas of Ecological Concern

Drainage Name	Anadromous Species (Habitat in miles)								
	KS	PS	CS	SS	RS	AC	UN		
Kanuktik Creek					10				
Kuskokwim River	(NOT IN THIS REFUGE)								
Eek River		35	35	25	45				
Kwithluk River	15	45	25	20					
Unnamed Creek	5			5					
Canyon Creek		7							
Kisaralik River		55	30						
Unnamed Creek		4							
Total Habitat	257	259	546	404	768	148			

Key Anadromous Fish Spawning and Rearing Areas
Togiak National Wildlife Refuge
and Associated Areas of Ecological Concern

Drainage Name	Anadromous Species (Key area in miles)								
	KS	PS	CS	SS	RS	AC	UN		
Nushagak River									
Wood River									
Unnamed Creek					3				
Sunshine Valley River					9				
Youth Creek					3				
Snake River									
Killian Creek					4				
Weary River									
Igushik River		6	6						
Tuklung River			11						
Lake Amanka					X				
Longhorn Creek					6				
Unnamed Creeks									
Kathleen River					8				
Ongake River					15				
Unnamed Creek					8				
Unnamed Creek									
Ualik Lake					X				
Francis Creek					10				
Unnamed Creek					4				
Kanik River			7						
Tithe Creek			8		3				
Tithe Creek Ponds									
Kulukak River			18			X			
Unnamed Creek									
Metervik Bay Creek									

Continued

Key Anadromous Fish Spawning and Rearing Areas
Togiak National Wildlife Refuge
and Associated Areas of Ecological Concern

Drainage Name	Anadromous Species (Habitat in miles)								
	KS	PS	CS	SS	RS	AC	UN		
Right Hand Point Creek									
Ungalukthluk River					10				
Nukayachagak Creek									
Togiak River	50	25	25	35					
Gechiak Creek					10				
Unnamed Creek									
Pungokepuk Creek					18				
Unnamed Creek									
Kashaiak River	5	8	14						
Nagugun Creek									
Narogurum River									
[redacted]									
Ongivinuck River									
Kipnuktuli Creek									
Togiak Lake					X				
Unnamed Creeks					15				
Trail Creek	10			10	12				
Izavieknik River					10				
Kurtluk River									
Quigmy River									
Matogak River									
Nisua River									
Osviak River									
Unnamed Creek									

Continued

Key Anadromous Fish Spawning and Rearing Areas
Togiak National Wildlife Refuge
and Associated Areas of Ecological Concern

Drainage Name	Anadromous Species (Key area in miles)								
	KS	PS	CS	SS	RS	AC	UN		
North Hagemeister Creek									
South Hagemeister Creek									
Salmon River									
Smalls River			7						
Goodnews River	13		25	18	70				
Barnum Creek									
Canyon Creek				4	12				
Awayak Creek					10				
UNNAMED CREEK					3				
Middle Fork			12		47				
Kukaktlim River					22				
South Fork			16						
Tunulik River									
Carter Creek			8						
Indian River									
North Fork									
Nautilus Creek									
Cripple Creek			7		8				
Jacksmith Creek			10						
Arolik - North Mouth			8						
Arolik - South Mouth			12						
Faro Creek									
East Fork			10						
Kanektok River	10		15		10				
Takshilik Creek									
NUKLUK Creek									

Continued

Key Anadromous Fish Spawning and Rearing Areas
Togiak National Wildlife Refuge
and Associated Areas of Ecological Concern

Drainage Name	Anadromous Species (Key area in miles)								
	KS	PS	CS	SS	RS	AC	UN		
Kanuktik Creek									
Kuskokwim River									
Eek River			15	25	8				
Kwithluk River	15		10	20					
Unnamed Creek		4	30						
Canyon Creek									
Kisaralik River									
Unnamed Creek									
Key Area Total	103	43	274	112	338				

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Sunshine Valley — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969	70		

Notes: Aerial Survey

Weary River — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	230
1964		1971	60
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Aerial Survey

Igushik River — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	100
1964		1971	40
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Aerial Survey

Kulukak River — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	1,490
1964		1971	2,360
1965		1972	650
1966		1973	
1967	460	1974	
1968	290	1975	
1969	260		

Notes: Aerial Survey

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Pungokepuk Creek — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	50 150
1964		1971	150
1965		1972	200
1966		1973	
1967		1974	
1968	330	1975	
1969	100		

Notes: Aerial Survey

Narogurum River — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	170
1964		1971	180
1965		1972	170
1966		1973	
1967		1974	
1968	540	1975	
1969	260		

Notes: Aerial Survey

Ongivinuck River — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	310
1964		1971	220
1965		1972	220
1966		1973	
1967		1974	
1968	450	1975	
1969	370		

Notes: Aerial Survey

Kashaiak River — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	60
1964		1971	220
1965		1972	210
1966		1973	
1967		1974	
1968	400	1975	
1969	200		

Notes: Aerial Survey

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Nukayachagak Creek — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	50
1964		1971	220
1965		1972	160
1966		1973	
1967	80	1974	
1968	10	1975	
1969	60		

Notes: Aerial Survey

Ungalikthluk River — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	470
1964		1971	470
1965		1972	120
1966		1973	
1967	50	1974	
1968	130	1975	
1969	280		

Notes: Aerial Survey

Gechiak Creek — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	570
1964		1971	980
1965		1972	1,320
1966		1973	
1967	610	1974	
1968	800	1975	
1969	440		

Notes: Aerial Survey

Togiak River — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	1,950
1964		1971	3,700
1965		1972	2,490
1966		1973	
1967	2,700	1974	
1968	4,940	1975	
1969	2,100		

Notes: Aerial Survey

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Kipnuktuli Creek — King Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969	20		

Notes: Aerial Survey

Togiak River — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963	102,396	1970	192,096
1964	95,574	1971	190,842
1965	88,386	1972	74,070
1966	91,098	1973	95,730 (171,623)*
1967	69,330	1974	
1968	42,918	1975	
1969	109,266		

Notes: *Escapement (Total run)

Pungokepuk Lake — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	1,300
1964		1971	2,200
1965		1972	3,500
1966	730	1973	
1967	350	1974	
1968	470	1975	
1969	800		

Notes: Aerial Survey

Gechiak Lake — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	2,800
1964		1971	1,300
1965		1972	200
1966	3,110	1973	
1967	2,200	1974	
1968	1,400 *	1975	
1969	2,200		

Notes: *Estimate, not based on aerial observation.

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Killian Creek — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	2,300
1964		1971	700
1965		1972	300
1966	530	1973	
1967	2,300	1974	
1968	700	1975	
1969	1,400		

Notes: Aerial Survey

Tithe Creek Ponds — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	3,000
1964		1971	5,000
1965		1972	1,500
1966	4,300	1973	
1967	4,050	1974	
1968	1,920	1975	
1969	3,200		

Notes: Aerial Survey

Kulukak (Total System) — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963	11,400	1970	10,000
1964	9,800	1971	13,000
1965	16,300	1972	3,400
1966	18,800	1973	8,000 – (23,277)*
1967	10,000	1974	
1968	6,500	1975	
1969	8,400		

Notes: *Escapement (Total run)

Aerial Survey

Kulukak River & Lake — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	2,000
1964		1971	1,500
1965		1972	200
1966	4,200	1973	
1967	380	1974	
1968	1,060	1975	
1969	1,070		

Notes: AERIAL SURVEY

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Ongivinuk Lake — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	1,300
1964		1971	1,200
1965		1972	1,700
1966	1,970	1973	
1967	2,600	1974	
1968	900	1975	
1969	700		

Notes: Aerial Survey

Quigmy River — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	1,700
1964	10,000	1971	3,400
1965	8,200	1972	3,700
1966	2,300	1973	
1967	1,800	1974	
1968	2,200	1975	
1969	1,000		

Notes: Aerial Survey

Matogak-Osviak Rivers (Combined) — Sockeye Salmon

Year	No. of Fish	Year	No. of Fish
1963	13,800	1970	10,800
1964	9,300	1971	9,400
1965	8,100	1972	4,500
1966	13,100	1973	
1967	12,000	1974	
1968	7,000	1975	
1969	7,400		

Notes: Aerial Survey

Togiak River — Coho Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967	2,100 (10,000)*	1974	
1968	4,030 (12,000-15,000)*	1975	
1969			

1969

Notes: Aerial Survey count (Total escapement estimate)

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Narogurum River — Coho Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968	100	1975	
1969			

Notes: Aerial Survey

Kashaiak River — Coho Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968	200	1975	
1969			

Notes: Aerial Survey

Gechiak Creek — Coho Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967	1,400	1974	
1968	1,200	1975	
1969			

Notes: Aerial Survey

Togiak River — Pink Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964	924	1971	
1965		1972	
1966	30,000	1973	
1967		1974	
1968		1975	
1969			

Notes:

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Kanik River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964	100	1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Estimated escapement is two times the observed aerial count.

Aerial Survey

Kulukak River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	11,400
1964	5,900	1971	14,800
1965		1972	6,800
1966		1973	
1967	9,100	1974	
1968	7,400	1975	
1969	4,400		

Notes: Estimated escapement is two times the observed aerial counts, except in 1968 when estimated escapement was three times the observed aerial count, & 1971 when est. esc. was 2½ times the observed aerial count.

Metervik Bay Creek — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966	100	1973	
1967	100	1974	
1968	200	1975	
1969	50		

Notes: Estimated run is twice the observed aerial escapements except in 1968 when estimated escapement is three times the observed aerial count.

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Aerial Survey

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Right Hand Point Creek — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	500
1964		1971	*
1965		1972	
1966	1,500	1973	
1967	1,000	1974	
1968	500	1975	
1969	400		

Notes: * Estimated escapements are twice the observed aerial counts.

Aerial Survey.

Ungalikthluk River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	700
1964		1971	1,600
1965		1972	1,600
1966		1973	
1967	2,300	1974	
1968	1,700	1975	
1969	1,500		

Notes: Estimated escapement is twice the observed aerial counts except in 1968 when est. esc. is three times the obs. aerial counts, and 1971 when est. esc. is 2½ times the obs. aerial counts.

Nukayachagak River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	7,700
1964		1971	10,000
1965		1972	10,800
1966		1973	
1967	7,500	1974	
1968	3,800	1975	
1969	5,400		

Notes: Estimated escapement is twice the observed aerial counts except in 1971 when est. esc. is 2½ times the observed aerial counts.

Togiak River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	46,500
1964	20,000	1971	16,200
1965	9,400	1972	21,300
1966	*	1973	
1967	43,600	1974	
1968	109,300	1975	
1969	10,600		

Notes: * Estimated escapement is twice the observed aerial count except during 1967 & 1968 when est. esc. was 1½ times, & 1970 & 1971 when est. esc. was 2½ times the observed aerial cnt.

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Ongivinuck River	Chum Salmon		
Year	No. of Fish	Year	No. of Fish
1963		1970	3,400
1964	2,500	1971	1,200
1965	*	1972	1,800
1966	*	1973	
1967	*	1974	
1968	5,300	1975	
1969	300		

Notes: * Estimated escapement is twice the aerial count except during 1970 & 1971 when est. esc. is 2½ times the observed aerial count.

Aerial Survey

Gechiak River	Chum Salmon		
Year	No. of Fish	Year	No. of Fish
1963		1970	3,200
1964	1,400	1971	3,200
1965	*	1972	4,600
1966	4,000	1973	
1967	1,400	1974	
1968	7,000	1975	
1969	1,000		

Notes: *Est. escapement is twice the observed aerial count except in 1970 & 1971 when est. esc. was 2½ times the observed aerial counts.

Pungokepuk Creek	Chum Salmon		
Year	No. of Fish	Year	No. of Fish
1963		1970	700
1964	1,100	1971	600
1965	*	1972	1,300
1966	*	1973	
1967	*	1974	
1968	4,300	1975	
1969	100		

Notes: *Est. escapement is twice the observed aerial count except during 1971 and 1972 when est. esc. was 2½ times the observed aerial count.

Aerial Survey

Narogurum River	Chum Salmon		
Year	No. of Fish	Year	No. of Fish
1963		1970	400
1964		1971	200
1965		1972	100
1966		1973	
1967		1974	
1968	2,500	1975	
1969	100		

Notes: Estimated escapements are twice the observed aerial counts except in 1970 and 1971 when est. esc. is 2½ times the observed aerial counts.

Magnitude of Runs or Escapements

Togial National Wildlife Refuge

Kashaiak River	Chum Salmon		
Year	No. of Fish	Year	No. of Fish
1963		1970	200
1964		1971	900
1965		1972	1,500
1966		1973	
1967		1974	
1968	14,100	1975	
1969	300		

Notes: Estimated escapements are twice the observed aerial counts except in 1970 1970 and 1971 when est. esc. is 2½ times the observed aerial counts.

Aerial Survey

E. Togiak Creek	Chum Salmon		
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967	200	1974	
1968		1975	
1969			

Notes: Estimated escapement is twice the observed aerial count.

Aerial Survey

Pierce Creek	Chum Salmon		
Year	No. of Fish	Year	No. of Fish
1963		1970	1,400
1964		1971	2,400
1965		1972	900
1966		1973	
1967	700	1974	
1968	1,200	1975	
1969	800		

Notes: Estimated run is twice the observed aerial counts, except in 1972 when estimated escapement is 2½ times the the observed aerial count.

Aerial Survey

Kurtluk River	Chum Salmon		
Year	No. of Fish	Year	No. of Fish
1963		1970	60
1964		1971	
1965		1972	
1966		1973	
1967	100	1974	
1968	1,700	1975	
1969	850		

Notes: Estimated escapements are twice the observed aerial counts.

Aerial Survey

Magnitude of Runs or Escapements

Togiak National Wildlife Refuge

Matogak River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	6,300
1964	8,200	1971	9,300
1965	15,600	1972	4,000
1966	10,100	1973	
1967	2,900	1974	
1968	12,200	1975	
1969	5,400		

Notes: Estimated run is twice the observed aerial escapement.

Aerial Survey.

Osviak River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	6,700
1964	15,000	1971	11,000
1965	9,800	1972	13,400
1966	6,300	1973	
1967	7,800	1974	
1968	12,300	1975	
1969	5,200		

Notes: Aerial Survey.
Estimated run is twice the observed aerial escapement.

South Hagemeister River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	1,800
1964	3,800 **	1971	1,500
1965	4,600 **	1972	1,700
1966	*	1973	
1967	1,200	1974	
1968	1,600	1975	
1969	200		

Notes: *Estimated run is twice the observed aerial escapements.

**Combined north and south Hagemeister aerial counts.

North Hagemeister River — Chum Salmon

Year	No. of Fish	Year	No. of Fish
1963		1970	1,100
1964	3,800 **	1971	2,600
1965	4,600 **	1972	1,400
1966	*	1973	
1967	1,900	1974	
1968	1,200	1975	
1969	700		

Notes: *Estimated run is twice the observed aerial escapements.

**Combined north and south Hagemeister aerial counts.

Subsistence Harvest

Togiak National Wildlife Refuge

King Salmon — Kuskokwim (335-40)

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	2,254
1965		1972	3,002
1966		1973	2,678
1967		1974	
1968		1975	
1969			

Notes: Quinhagak Village

King Salmon — Kuskokwim (335-50)

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	285
1965		1972	188
1966		1973	493
1967		1974	
1968		1975	
1969			

Notes: Goodnews Bay Village

Coho Salmon — Kuskokwim (335-40)

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	1,474
1965		1972	459
1966		1973	3,654
1967		1974	
1968		1975	
1969			

Notes: Quinhagak Village

Coho Salmon — Kuskokwim (335-50)

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	70
1965		1972	1,121
1966		1973	-
1967		1974	
1968		1975	
1969			

Notes: Goodnews Bay Village

Subsistence Harvest

Togiak National Wildlife Refuge

Chum Salmon * Kuskokwim (335-40)

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	3,584
1965		1972	5,324
1966		1973	4,326
1967		1974	
1968		1975	
1969			

Notes: *Contains small numbers of sockeye and pink salmon

Quinhagak Village

Chum Salmon * Kuskokwim (335-50)

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	1,530
1965		1972	300
1966		1973	483
1967		1974	
1968		1975	
1969			

Notes: *Contains small numbers of sockeye and pink salmon

Goodnews Bay Village

Sockeye Salmon Kuskokwim (335-40)

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	43
1965		1972	356
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Quinhagak Village

Sockeye Salmon Kuskokwim (335-50)

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	0
1965		1972	571
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Goodnews Bay Village

Subsistence Harvest

Togiak National Wildlife Refuge

Pink Salmon		Kuskokwim (335-40)	
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	2
1965		1972	604
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Quinhagak Village

Pink Salmon		Kuskokwim (335-50)	
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	336
1965		1972	20
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Goodnews Bay Village

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:

Subsistence Harvest

Togiak National Wildlife Refuge

Chum Salmon			Togiak 326
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965	1,600	1972	
1966		1973	
1967		1974	2,000
1968		1975	
1969			

Notes:

Sockeye Salmon			Togiak 326
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965	4,600	1972	
1966		1973	
1967		1974	7,400
1968		1975	
1969			

Notes:

King Salmon			Togiak 326
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965	100	1972	
1966		1973	
1967		1974	1,200
1968		1975	
1969			

Notes:

Pink Salmon			Togiak 326
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965	100	1972	
1966		1973	
1967		1974	500
1968		1975	
1969			

Notes:

Subsistence Harvest

Togiak National Wildlife Refuge

Coho Salmon			Togiak 326
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965	2,200	1972	
1966		1973	
1967		1974	1,800
1968		1975	
1969			

Notes:

Arctic char			Togiak 326
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:
estimated annual harvest exceeds 100,000 fish

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:

Commercial Harvest

Togiak National Wildlife Refuge

King Salmon — Quinhagak 335-40

Year	No. of Fish	Year	No. of Fish
1963		1970	18,629
1964	4,081	1971	3,546
1965	2,976	1972	15,180
1966	278	1973	12,568
1967	0	1974	
1968	8,879	1975	
1969	16,802		

Notes:

Coho Salmon — Quinhagak 335-40

Year	No. of Fish	Year	No. of Fish
1963		1970	16,675
1964	379	1971	2,982
1965		1972	393
1966		1973	16,415
1967	1,926	1974	
1968	21,296	1975	
1969	14,961		

Notes:

Sockeye Salmon — Quinhagak 335-40

Year	No. of Fish	Year	No. of Fish
1963		1970	5,393
1964	13,422	1971	3,118
1965	1,886	1972	3,286
1966	1,030	1973	2,783
1967	652	1974	
1968	5,884	1975	
1969	3,784		

Notes:

Pink Salmon — Quinhagak 335-40

Year	No. of Fish	Year	No. of Fish
1963		1970	15,195
1964	64,939	1971	13,000
1965		1972	1,878
1966	268	1973	277
1967		1974	
1968	75,818	1975	
1969	953		

Notes:

Commercial Harvest

Togiak National Wildlife Refuge

Chum Salmon — Quinhagak 335-40

Year	No. of Fish	Year	No. of Fish
1963		1970	46,556
1964	707	1971	30,208
1965	4,242	1972	17,247
1966	2,610	1973	19,680
1967	8,087	1974	
1968	19,497	1975	
1969	38,206		

Notes:

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:

King Salmon — Goodnews 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	7,163
1964		1971	477
1965		1972	148
1966		1973	2,420
1967		1974	
1968		1975	
1969	3,971		

Notes:

Coho Salmon — Goodnews 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	6,764
1964		1971	1,771
1965		1972	914
1966		1973	4,881
1967		1974	
1968	5,485	1975	
1969	11,619		

Notes:

Commercial Harvest

Togiak National Wildlife Refuge

Sockeye Salmon — Goodnews 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	7,144
1964		1971	330
1965		1972	924
1966		1973	2,072
1967		1974	
1968		1975	
1969	6,256		

Notes:

Pink Salmon — Goodnews 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	12,183
1964		1971	
1965		1972	66
1966		1973	324
1967		1974	
1968		1975	
1969	298		

Notes:

Chum Salmon — Goodnews 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	12,346
1964		1971	301
1965		1972	1,331
1966		1973	15,781
1967		1974	
1968		1975	
1969	5,006		

Notes:

Sockeye Salmon — Togiak 326

Year	No. of Fish	Year	No. of Fish
1963	186,213	1970	153,377
1964	250,775	1971	209,060
1965	217,100	1972	
1966	199,799	1973	
1967	101,107	1974	138,636
1968	72,699	1975	186,659
1969	134,252		

Notes:

Commercial Harvest

Togiak National Wildlife Refuge

Sockeye Salmon			Togiak 326-00
Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	52,931
1966		1973	75,893
1967		1974	
1968	65,475	1975	
1969			

Notes:

Sockeye Salmon			Kulukak 326-10
Year	No. of Fish	Year	No. of Fish
1963	554	1970	
1964	8,286	1971	
1965		1972	14,522
1966	7,263	1973	15,277
1967	24,379	1974	
1968	2,618	1975	
1969			

Notes:

Sockeye Salmon			Matogak 326-20
Year	No. of Fish	Year	No. of Fish
1963		1970	338
1964		1971	
1965		1972	1,214
1966		1973	1,644
1967		1974	
1968	4,606*	1975	
1969			

Notes: *Includes Matogak and Osviak combined

Sockeye Salmon			Osviak 326-30
Year	No. of Fish	Year	No. of Fish
1963		1970	291
1964		1971	
1965		1972	5,491
1966	2,057	1973	2,832
1967	5,191	1974	
1968	4,606*	1975	
1969			

Notes: * Includes Matogak and Osviak combined

Commercial Harvest

Togiak National Wildlife Refuge

Sockeye Salmon — Cape Pierce 326-40

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	2
1967	25	1974	
1968		1975	
1969			

Notes:

Pink Salmon — Togiak 326

Year	No. of Fish	Year	No. of Fish
1963	176	1970	1,700
1964	2,001	1971	200
1965	91	1972	1,762
1966	13,545	1973	212
1967	829	1974	13,059
1968	11,743	1975	190
1969	1,396		

Notes:

Chum Salmon — Togiak 326

Year	No. of Fish	Year	No. of Fish
1963	77,167	1970	100,700
1964	132,411	1971	123,800
1965	66,833	1972	179,195
1966	95,410	1973	197,298
1967	63,322	1974	79,271
1968	108,011	1975	87,172
1969	66,389		

Notes:

Coho Salmon — Togiak 326

Year	No. of Fish	Year	No. of Fish
1963	1,138	1970	2,000
1964	5,859	1971	3,200
1965	521	1972	8,275
1966	15,864	1973	22,696
1967	18,159	1974	24,855
1968	24,872	1975	3,683
1969	28,720		

Notes:

Commercial Harvest

Togiak National Wildlife Refuge

King Salmon — Togiak 326

Year	No. of Fish	Year	No. of Fish
1963	6,192	1970	28,700
1964	10,716	1971	27,000
1965	10,909	1972	19,555
1966	9,967	1973	10,837
1967	13,381	1974	10,591
1968	13,499	1975	7,187
1969	20,181		

Notes:

King Salmon — Togiak 326-00

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	17,268
1966		1973	9,239
1967		1974	
1968	12,948	1975	
1969			

Notes:

King Salmon — Kulukak 326-10

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964	313	1971	2,100
1965		1972	1,380
1966	25	1973	
1967	850	1974	
1968	139	1975	
1969			

Notes:

King Salmon — Matogak 326-20

Year	No. of Fish	Year	No. of Fish
1963		1970	16
1964		1971	
1965		1972	26
1966		1973	51
1967		1974	
1968	412*	1975	
1969			

Notes: *Includes Matogak and Osviak combined

Commercial Harvest

Togiak National Wildlife Refuge

King Salmon — Osviak 326-30

Year	No. of Fish	Year	No. of Fish
1963		1970	30
1964		1971	
1965		1972	161
1966	328	1973	167
1967	208	1974	
1968	412*	1975	
1969			

Notes:

*Includes Osviak and Matogak combined

King Salmon — Cape Pierce 326-40

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967	1	1974	
1968		1975	
1969			

Notes:

Chum Salmon — Togiak 326-00

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	99,576
1966		1973	136,847
1967		1974	
1968	57,123	1975	
1969			

Notes:

Chum Salmon — Kulukak 326-10

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964	7,198	1971	
1965		1972	24,315
1966	4,094	1973	16,725
1967	9,388	1974	
1968	3,155	1975	
1969			

Notes:

Commercial Harvest

Togiak National Wildlife Refuge

Chum Salmon — Matogak 326-20

Year	No. of Fish	Year	No. of Fish
1963		1970	1,392
1964		1971	
1965		1972	8,729
1966		1973	17,704
1967		1974	
1968	47,723*	1975	
1969			

Notes: *Includes Matagak and Osviak combined

Chum Salmon — Osviak 326-30

Year	No. of Fish	Year	No. of Fish
1963		1970	3,044
1964		1971	
1965		1972	46,575
1966	16,784	1973	21,495
1967	15,813	1974	
1968	47,723 *	1975	
1969			

Notes: *Includes Matagak and Osviak combined

Chum Salmon — Cape Pierce 326-40

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	4,527
1967	329	1974	
1968		1975	
1969			

Notes:

Pink Salmon — Togiak 326-00

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	1,466
1966		1973	
1967		1974	
1968	9,818	1975	
1969			

Notes:

Commercial Harvest

Togiak National Wildlife Refuge

Pink Salmon — Kulukak 326-10

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964	14	1971	
1965		1972	163
1966	810	1973	
1967	214	1974	
1968	232	1975	
1969			

Notes:

Pink Salmon — Matogak 326-20

Year	No. of Fish	Year	No. of Fish
1963		1970	21
1964		1971	
1965		1972	14
1966		1973	
1967		1974	
1968	1,693*	1975	
1969			

Notes: * Includes Matogak and Osviak combined

Pink Salmon — Osviak 326-30

Year	No. of Fish	Year	No. of Fish
1963		1970	18
1964		1971	
1965		1972	119
1966	451	1973	
1967	207	1974	
1968	1,693*	1975	
1969			

Notes: *Includes Matogak and Osviak combined

Pink Salmon — Cape Pierce 326-40

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967	2	1974	
1968		1975	
1969			

Notes:

Commercial Harvest

Togiak National Wildlife Refuge

Coho Salmon — Togiak 326-00

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	7,043
1966		1973	18,112
1967		1974	
1968	24,054	1975	
1969			

Notes:

Coho Salmon — Kulukak 326-10

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	1,139
1966	18	1973	3,439
1967		1974	
1968		1975	
1969			

Notes:

Coho Salmon — Matagak 326-20

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968	822*	1975	
1969			

Notes: *Includes Matagak and Osviak combined

Coho Salmon — Osviak 326-30

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	93
1966		1973	1,145
1967	3	1974	
1968	822*	1975	
1969			

Notes: *Includes Matagak and Osviak combined

Commercial Value

Togiak National Wildlife Refuge

King Salmon — Kuskokwim (335-40)

Year	$ Value	Year	$ Value
1963	13,300	1970	70,400
1964	-	1971	16,100
1965	830	1972	74,700
1966	0	1973	85,800
1967	33,200	1974	
1968	63,850	1975	
1969			

Notes:

Coho Salmon — Kuskokwim (335-50)

Year	$ Value	Year	$ Value
1963		1970	17,200
1964	133	1971	2,400
1965	-	1972	393
1966	-	1973	24,600
1967	1,000	1974	
1968	14,300	1975	
1969	11,400		

Notes:

Sockeye Salmon — Kuskokwim (335-40)

Year	$ Value	Year	$ Value
1963	-	1970	6,200
1964	6,700	1971	2,200
1965	-	1972	2,900
1966	515	1973	6,460
1967	260	1974	
1968	3,530	1975	
1969	3,440		

Notes:

King Salmon — Kuskokwim (335-50)

Year	$ Value	Year	$ Value
1963		1970	27,100
1964		1971	-
1965		1972	730
1966		1973	16,500
1967		1974	
1968	-	1975	
1969	15,100		

Notes:

Commercial Value

Togiak National Wildlife Refuge

Coho Salmon — Kuskokwim 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	6,970
1964		1971	1,450
1965		1972	914
1966		1973	11,320
1967		1974	
1968	3,670	1975	
1969	8,830		

Notes:

Sockeye Salmon — Kuskokwim 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	8,200
1964		1971	
1965		1972	810
1966		1973	4,800
1967		1974	
1968		1975	
1969	5,700		

Notes:

Pink Salmon — Kuskokwim 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	3,170
1964		1971	
1965		1972	16
1966		1973	172
1967		1974	
1968		1975	
1969	66		

Notes:

Chum Salmon — Kuskokwim 335-50

Year	No. of Fish	Year	No. of Fish
1963		1970	6,300
1964		1971	
1965		1972	720
1966		1973	20,200
1967		1974	
1968		1975	
1969	2,150		

Notes:

Commercial Value

Togiak National Wildlife Refuge

Pink Salmon			Kuskokwim 335-40
Year	$ Value	Year	$ Value
1963		1970	3,950
1964		1971	
1965		1972	470
1966	27	1973	150
1967		1974	
1968	15,200	1975	
1969	210		

Notes:

Chum Salmon			Kuskokwim 335-40
Year	$ Value	Year	$ Value
1963		1970	23,700
1964		1971	15,100
1965		1972	9,300
1966	260	1973	25,200
1967	2,020		
1968	6,820		
1969			

Notes:

Year	$ Value	Year	$ Value

Notes:

Year	$ Value	Year	$ Value

Notes:

Commercial Value

Togiak National Wildlife Refuge

Sockeye Salmon			Togiak 326
Year	$ Value	Year	$ Value
1963	201,000	1970	191,000
1964	273,000	1971	326,000
1965	237,000		
1966	226,000		
1967	119,000		
1968	86,000		
1969	203,000		

Notes: Based on prices paid to independent fishermen.

Pink Salmon			Togiak 326
Year	$ Value	Year	$ Value
1963	56	1970	578
1964	640	1971	94
1965	29		
1966	4,470		
1967	274		
1968	3,875		
1969	558		

Notes: Based on prices paid to independent fishermen.

Chum Salmon			Togiak 326
Year	$ Value	Year	$ Value
1963	44,800	1970	55,400
1964	76,800	1971	95,300
1965	38,800		
1966	57,200		
1967	38,000		
1968	64,800		
1969	46,500		

Notes: Based on prices paid to independent fishermen.

Coho Salmon			Togiak 326
Year	$ Value	Year	$ Value
1963	1,230	1970	2,600
1964	6,390	1971	4,030
1965	568		
1966	17,900		
1967	21,400		
1968	29,300		
1969	32,200		

Notes: Based on prices paid to independent fishermen.

Commercial Value

Togiak National Wildlife Refuge

King Salmon — Togiak 326

Year	$ Value	Year	$ Value
1963	11,600	1970	107,912
1964	20,000	1971	113,400
1965	20,400		
1966	19,300		
1967	26,000		
1968	26,200		
1969	73,500		

Notes: Based on prices paid to independent fishermen.

Year	$ Value	Year	$ Value

Notes:

Year	$ Value	Year	$ Value

Notes:

Year	$ Value	Year	$ Value

Notes:

Commercial Effort

Togiak National Wildlife Refuge

Kuskokwim District (335-40)

Year	Commercial Licenses	Number of Set Nets	Number of Drift Nets	Boat Hours	
1963					Notes: King Salmon harvest
1964	26		24		
1965	26		22	3,674	
1966	8		8		
1967	17	1	10		
1968	55		39		
1969	78	1	65	22,400	
1970	60		53	8,030	
1971	51		46	1,090	
1972	66		53	4,835	
1973	61		52	3,622	
1974					
1975					

Commercial Effort

Togiak National Wildlife Refuge

Kuskokwim District (335-40)

Year	Fisherman-Hours (Daily)	Number of Fishermen		
1963				Notes: Coho Salmon harvest
1964				
1965				
1966				
1967	594	20		
1968	6,624	34		
1969	5,610	49		
1970	13,128	52		
1971	2,616	38		
1972	246	17		
1973	3,845	46		
1974				
1975				

Commercial Effort

Togiak National Wildlife Refuge

Kuskokwim District (335-50)

Year	Commercial Licenses	Number of Set Nets	Number of Drift Nets	Boat Hours	
1963					Notes: King Salmon harvest
1964					
1965					
1966					
1967					
1968	20	4	14		
1969	57	35	42	15,270	
1970	46	35	36	6,694	
1971	28	18	27	125	
1972	21	1	18	108	
1973	24	1	18	637	

Commercial Effort

Togiak National Wildlife Refuge

Kuskokwim District (335-50)

Year	Fisherman-Hours (Daily)	Number of Fishermen		
1963				Notes: Coho Salmon harvest
1964				
1965				
1966				
1967				
1968	4,704	18		
1969	4,176	29		
1970	3,528	23		
1971	528	8		
1972	468	8		
1973	480	14		
1974				
1975				

Commercial Effort

Togiak National Wildlife Refuge

Togiak District (326)

Year	Number of Set Nets	Number of Drift Nets
1963		103
1964	3	86
1965	3	93
1966	6	95
1967	4	96
1968		
1969		
1970		
1971	29	76
1972	35	81
1973	11	220
1974		
1975		

Commercial Effort

Togiak National Wildlife Refuge

Togiak District (326)

Year	Max. No. of Units-Drift Gillnet Effort	Max. No. of Units - Set Net Effort
1963		
1964	92	5
1965	105	2
1966	111	8
1967	125	7
1968	96	4
1969	93	5
1970	71	2
1971	93	4
1972		
1973		
1974		
1975		

Commercial Effort

Togiak National Wildlife Refuge

Bristol Bay Area (Total)

Year	Number of Set Nets	Number of Drift Nets
1963	889	1,459
1964	930	1,636
1965	993	1,593
1966	965	1,865
1967	830	1,699
1968	839	1,684
1969	970	1,928
1970	890	1,881
1971	846	1,865
1972		
1973		
1974		
1975		

Sport Harvest

Togiak National Wildlife Refuge

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes: Little documented sport utilization of anadromous species in this area

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:

Year	No. of Fish	Year	No. of Fish
1963		1970	
1964		1971	
1965		1972	
1966		1973	
1967		1974	
1968		1975	
1969			

Notes:

Anadromous Fish Inventory Update System
Togiak National Wildlife Refuge, Alaska

Comprehensive statistical summaries of anadromous fish data for the proposed refuge are compiled in Annual Management Report, Bristol Bay Area, an informal report by the Bristol Bay area management biologists of the Alaska Department of Fish and Game. This document is prepared at the Anchorage office with contributions from various field personnel. Usually these data will be available in the spring following a field season. Probably April or May would be the opportune time to request this report for the previous year.

Past investigations have been conducted by the Division of Sport Fish, Alaska Department of Fish and Game under the Federal Aid in Fish Restoration Program. These studies are titled Inventory and Cataloging of Sport Fish and Sport Fish Waters in Bristol Bay and Lower Kuskokwim Drainages. It is not often that these reports contain material on the Togiak area, but they should be checked each year to determine their applicability. Recent reports in this series have been compiled by Louis A. Gwartney, fishery biologist. Again, these data should become available in the spring following the previous summer's field season.

A number of Alaska Department of Fish and Game serial publications regularly contain data on the Togiak area. These series should be consulted from time to time or a request placed with the Division of Commercial Fisheries, Alaska Department of Fish and Game, Juneau to regularly receive these publications. The three series which carry Togiak information are the Informational Leaflets, Bristol Bay Data Reports, and Technical Data Reports. Usually, the Technical Data Reports contain data on catch and escapement, as well as smolt counts. The Informational Leaflet series contains various

miscellaneous reports. The Bristol Bay Data Report series contains comprehensive summaries and statistics of the fishery as well as specific reports on various aspects of the individual stocks and their management. These reports come out on an irregular basis, and a standing request for all publications in these series would probably be most helpful in maintaining a current awareness of the Togiak Refuge.

Since the Quinhagak and Goodnews areas are in the Arctic-Yukon-Kuskokwim region, comprehensive statistical summaries of anadromous fish data for these areas will be found in the Annual Management Report, Arctic-Yukon-Kuskokwim Region. This informal report is prepared by the Anchorage office by A-Y-K regional management biologists of the Alaska Department of Fish and Game's Anchorage office with various contributions from field personnel. Again, this data usually becomes available in the spring following the previous summer's field season.

For the Goodnews and Quinhagak areas, manuscripts concerning the results of specific fishery research projects conducted by the Division of Commercial Fisheries, Alaska Department of Fish and Game have been compiled in a series called Arctic-Yukon-Kuskokwim Region Fishery Bulletins. This series is issued irregularly, and an example of such a study is Baxter's study in 1971 on the Quinhagak tagging program.

Anadromous Fish Inventory Study Needs
Togiak National Wildlife Refuge, Alaska

1. Aerial surveys need to be conducted to ascertain escapement levels for streams entering salt water north of Cape Newenham. The populations in these waters are not well known.

2. Subsistence data need to be collected in more detail for Togiak. Large subsistence harvests of Arctic char are recorded but detailed subsistence data are lacking.

3. Sport harvest data (creel census) need to be collected particularly from the Togiak drainage system, since little is presently known of the sport fishery which does occur in this area.

4. Commercial harvest data for the Kulukak, Matogak, Osviak, and Cape Pierce sub-districts of the Togiak district need to be recorded in more detail. Only scattered records of the catch in these sub-districts exist from previous years.

Library
U.S. Fish & Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503
Merged With
A.R.L.I.S.
ANCHORAGE, ALASKA
Est. 1997